# Melamine

Safety Data Sheet

according to UK REACH under the European Union (Withdrawal) Act 2018
SDS ID: OC00016
Revision date: 10/10/2025 Supersedes: 20/02/2024 Version: 6.2

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

### 1.1. Product identifier

| | | |
|---|---|---|
| Product form | : | Substance |
| Name | : | Melamine |
| Trade name | : | MelaminebyOCITM GPH<br>MelaminebyOCITM SLP<br>Melafine®<br>MelaminebyOCITM Novo GPH<br>MelaminebyOCITM Novo SLP<br>Melafine® Novo |
| IUPAC name | : | 1,3,5-Triazine-2,4,6-triamine |
| EC-No. | : | 203-615-4 |
| CAS-No. | : | 108-78-1 |
| UK REACH registration No. | : | UK-01-3876358276-4-0006 |
| Type of product | : | Solid |
| Formula | : | $C_3H_6N_6$ |
| Synonyms | : | Cyanuramide; Cyanurotriamide; 2,4,6-Triamino-s-triazine |

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

#### 1.2.1. Relevant identified uses

| | | |
|---|---|---|
| Use of the substance/mixture | : | Industrial use<br>White crystalline powder, used in high performance products like wood-based panels, laminates, coatings, molding powders, concrete plasticizers and flame retardants |

#### 1.2.2. Uses advised against

| | | |
|---|---|---|
| Restrictions on use | : | Addition to food or feed products |

### 1.3. Details of the supplier of the safety data sheet

**Supplier**
OCI Nitrogen B.V.
Poststraat, 1
6135 KR Sittard
The Netherlands
T +31 (0) 46 7020205
info.melamine@oci-global.com - www.oci-global.com

### 1.4. Emergency telephone number

Emergency number : Alert & Care Centre Chemelot (Geleen, The Netherlands): +31 (0) 46 4765555 (24/7)

| Country/Area | Organisation/Company | Address | Emergency number | Comment |
|---|---|---|---|---|
| United Kingdom | NHS 111/NHS 24/NHS Direct | | 111<br>0845 4647 | or call a doctor |
| Wales | National Health Service (NHS) | | 0845 46 47 | |

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification according to GB CLP (SI 2019:720 as amended)**

| | |
|---|---|
| Carcinogenicity, Category 2 | H351 |
| Reproductive toxicity, Category 2 | H361f |
| Specific target organ toxicity – Repeated exposure, Category 2 | H373 |

Full text of H- and EUH-statements: see section 16

### Adverse physicochemical, human health and environmental effects

No additional information available

## 2.2. Label elements

### Labelling according to GB CLP (SI 2019:720 as amended)

Hazard pictograms (GHS UK) :

GHS08

Signal word (GHS UK) : Warning

Hazard statements (GHS UK) : H351 - Suspected of causing cancer.
H361f - Suspected of damaging fertility.
H373 - May cause damage to organs (urinary tract) through prolonged or repeated exposure.

Precautionary statements (GHS UK) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe dust, fume, gas, mist, vapours or spray.
P280 - Wear protective gloves, protective clothing, eye protection, face protection and hearing protection.
P314 - Get medical advice or attention. if you feel unwell.
P405 - Store locked up.

## 2.3. Other hazards

### Results of PBT and vPvB assessment

This substance does not meet the PBT criteria of UK REACH regulation, annex XIII
This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII

### Results of Endocrine Disruptor assessment

The substance is not included in the list established in accordance with Article 59(1) of UK REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in GB BPR and GB PPP

# SECTION 3: Composition/information on ingredients

## 3.1. Substances

Name : Melamine
CAS-No. : 108-78-1
EC-No. : 203-615-4

| Name | Product identifier | % | Classification according to GB CLP (SI 2019:720 as amended) |
|---|---|---|---|
| 1,3,5-Triazine-2,4,6-triamine | CAS-No.: 108-78-1<br>EC-No.: 203-615-4 | 100 | Carc. 2, H351<br>Repr. 2, H361f<br>STOT RE 2, H373 |

Full text of H- and EUH-statements: see section 16

## 3.2. Mixtures

Not applicable

# SECTION 4: First aid measures

## 4.1. Description of first aid measures

First-aid measures general : IF exposed or concerned: Get medical advice/attention.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. If breathing stops, give artificial respiration. Get medical attention if symptoms occur.
First-aid measures after skin contact : Wash skin with plenty of water and soap. Remove all contaminated clothing and footwear.
First-aid measures after eye contact : Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if symptoms occur.
First-aid measures after ingestion : Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : Dust from this product may cause irritation to the respiratory tract.
Symptoms/effects after eye contact : Dust from this product may cause eye irritation.
Chronic symptoms : May damage fertility. Suspected carcinogen. May cause damage to organs (urinary tract) through prolonged or repeated exposure.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Hazardous decomposition products in case of fire. Symptoms may be delayed. Consult an expert.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : The product is not flammable.
Hazardous decomposition products in case of fire : Under fire conditions, hazardous fumes will be present: Carbon dioxide, Carbon monoxide, Amines, Nitrogen oxides, Ammonia, Hydrogen cyanide > 600°C / 1112°F.

### 5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area. Evacuate unnecessary personnel. Do not breathe dust. Do not touch or walk on the spilled product. Avoid contact with skin, eyes and clothing.

#### 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

### 6.2. Environmental precautions

Avoid release to the environment. Do not allow to enter drains or water courses. Avoid sub-soil penetration. Advise local authorities if considered necessary.

### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Mechanically recover the product. Avoid dust formation. Keep in suitable, closed containers for disposal. Notify authorities if product enters sewers or public waters.
Other information : Dispose of waste product or used containers according to local regulations. Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

See sections 1, 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear personal protective equipment. Ensure good ventilation of the work station. Avoid dust formation. Do not breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Remove contaminated clothes. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in accordance with local, regional, national or international regulation. Store in dry, well-ventilated area. Store locked up.

Incompatible materials : Strong oxidizing agents.

Heat and ignition sources : Keep out of direct sunlight.

Storage area : (1) Do not stack big bags > 1000 kg. Do not stack more than two bulk bags <=1000 kg on top of each other in connection with the risk of ripping. (2) 'MelaminebyOCI SLP' may not be stacked.

### 7.3. Specific end use(s)

For the detailed identified uses of the product see appendix of the safety data sheet.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 National occupational exposure and biological limit values

No additional information available

#### 8.1.2. Recommended monitoring procedures

No additional information available

#### 8.1.3. Air contaminants formed

No additional information available

#### 8.1.4. DNEL and PNEC

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| **DNEL/DMEL (Workers)** | |
| Acute - systemic effects, inhalation | 82.3 mg/m³ |
| Long-term - systemic effects, dermal | 11.8 mg/kg bw/day |
| Long-term - systemic effects, inhalation | 8.3 mg/m³ |
| **DNEL/DMEL (General population)** | |
| Long-term - systemic effects,oral | 0.42 mg/kg bodyweight/day |
| Long-term - systemic effects, inhalation | 1.5 mg/m³ |
| Long-term - systemic effects, dermal | 4.2 mg/kg bodyweight/day |
| **PNEC (Water)** | |
| PNEC aqua (freshwater) | 0.51 mg/l |
| PNEC aqua (marine water) | 0.051 mg/l |
| PNEC aqua (intermittent, freshwater) | 2 mg/l |
| **PNEC (Sediment)** | |
| PNEC sediment (freshwater) | 13.06 mg/kg dwt |

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| PNEC sediment (marine water) | 1.306 mg/kg dwt |
| **PNEC (Soil)** | |
| PNEC soil | 2.312 mg/kg dwt |
| **PNEC (Oral)** | |
| PNEC oral (secondary poisoning) | Bioaccumulation unlikely |
| **PNEC (STP)** | |
| PNEC sewage treatment plant | 100 mg/l |

#### 8.1.5. Control banding

No additional information available

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

**Appropriate engineering controls:**
Ensure good ventilation of the work station. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. See annex for more detailed information.

#### 8.2.2. Personal protection equipment

**Personal protective equipment:**
When this substance/product is used in a mixture consult your industrial hygienist to adjust the personal protective equipment to the (hazard) properties of the mixture.
**Personal protective equipment symbol(s):**

#### 8.2.2.1. Eye and face protection

**Eye protection:**
Wear eye protection

| Eye protection | | | |
|---|---|---|---|
| **Type** | **Use** | **Characteristics** | **Standard** |
| Safety glasses with side shields | Dust | | EN ISO 16321-1 |

#### 8.2.2.2. Skin protection

**Skin and body protection:**
Wear suitable protective clothing

| Skin and body protection | |
|---|---|
| **Type** | **Standard** |
| Long sleeved protective clothing | EN ISO 13982 |

**Hand protection:**
Chemically resistant protective gloves. Efficiency of at least: 80%. To increase glove efficiency additional good practice is required, e.g. provision of training or management supervision.

| Hand protection | | | | | |
|---|---|---|---|---|---|
| **Type** | **Material** | **Permeation** | **Thickness (mm)** | **Penetration** | **Standard** |
| Protective gloves | Chloroprene rubber (CR), Butyl rubber, Polyvinylchloride (PVC) | 6 (> 480 minutes) | 0.5 | | EN 374 |
| Protective gloves | Nitrile rubber (NBR) | 6 (> 480 minutes) | 0.35 | | EN 374 |
| Protective gloves | Fluoroelastomer (FKM) | 6 (> 480 minutes) | 0.4 | | EN 374 |

#### 8.2.2.3. Respiratory protection

**Respiratory protection:**
In case of inadequate ventilation wear respiratory protection.

| Respiratory protection | | | |
|---|---|---|---|
| **Device** | **Filter type** | **Condition** | **Standard** |
| Dust mask | Type FFP2 | Dust protection | EN 140 |

#### 8.2.2.4. Thermal hazards

No additional information available

### 8.2.3. Environmental exposure controls

**Environmental exposure controls:**
Avoid release to the environment. See annex for more detailed information.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Solid |
| Appearance | : | Crystalline powder. |
| Colour | : | White. |
| Molecular mass | : | 126.12 g/mol |
| Odour | : | Odourless. Ammoniacal slight. |
| Odour threshold | : | Not available |
| pH | : | 7.8 – 9.5 (10% aqueous suspension) |
| pH solution | : | Not available |
| Melting point | : | 354 °C (with vaporization) |
| Freezing point | : | Not applicable |
| Boiling point | : | > 280 °C Decomposes |
| Flash point | : | > 280 °C (closed cup) |
| Flammability | : | Not flammable |
| Explosive limits | : | Not applicable |
| Lower explosive limit (LEL) | : | Not applicable |
| Upper explosive limit (UEL) | : | Not applicable |
| Vapour pressure | : | < 0.02 kPa (@ 20°C / 68°F) |
| Vapour pressure at 50°C | : | Not available |
| Relative vapour density at 20°C | : | 4.34 (air = 1) |
| Relative density | : | 1.57 (@ 20°C / 68°F) |
| Density | : | 1.57 g/cm³ |
| Solubility | : | Slightly soluble.<br>Water: 0.348 g/100ml (@ 20°C) |
| Partition coefficient n-octanol/water (Log Kow) | : | -1.22 (@ 20°C) |
| Auto-ignition temperature | : | > 500 °C |
| Decomposition temperature | : | > 280 °C |
| Viscosity, kinematic | : | Not applicable |
| Explosive properties | : | Not explosive |
| Oxidising properties | : | Non oxidizing. |

### 9.2. Other information

Particle size distribution : Available on request
Other properties : Ignition temperature: ≥ 658 °C

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

### 10.4. Conditions to avoid

Keep away from heat. Keep away from any flames or sparking source.

### 10.5. Incompatible materials

Oxidizing agents.

### 10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition can lead to the release of irritating gases and vapours. Thermal decomposition generates: Carbon monoxide, Carbon dioxide, Nitrogen oxides, Amines, Ammonia, Hydrogen cyanide > 600°C / 1112°F.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal) : Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation) : Not classified (Based on available data, the classification criteria are not met)

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| LD50 oral rat | 3161 mg/kg bodyweight |
| LC50 Inhalation - Rat | > 5.19 mg/l/4h (OECD 403 method) |

Skin corrosion/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: 7.8 – 9.5 (10% aqueous suspension)
Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)
pH: 7.8 – 9.5 (10% aqueous suspension)
Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity : Suspected of causing cancer.

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| IARC group | 2B - Possibly carcinogenic to humans |
| LOAEL, Chronic, oral, rat | 126 mg/kg bw/day |

Reproductive toxicity : Suspected of damaging fertility.

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| NOAEL (animal/male, F0/P) | 268 mg/kg bodyweight Fertility |
| NOAEL (animal/male, F1) | 89 mg/kg bodyweight Fertility |

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| Target organ(s) | testis, Sperm |

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)

STOT-repeated exposure : May cause damage to organs (urinary tract) through prolonged or repeated exposure.

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| NOAEL (oral, rat, 90 days) | 72 mg/kg bodyweight/day |
| STOT-repeated exposure | May cause damage to organs (urinary tract) through prolonged or repeated exposure. |
| Target organ(s) | urinary bladder, kidneys |

Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

| Melamine (108-78-1) | |
|---|---|
| Viscosity, kinematic | Not applicable |

### Other information

#### Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : Contains no substances identified as having endocrine disrupting properties

#### Other information

No additional information available

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

Hazardous to the aquatic environment, short–term (acute) : Not classified (Based on available data, the classification criteria are not met)

Hazardous to the aquatic environment, long–term (chronic) : Not classified (Based on available data, the classification criteria are not met)

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| LC50 fish 1 | > 3000 mg/l Oncorhynchus mykiss |
| EC50 Daphnia 1 | 200 mg/l Daphnia magna |
| EC50 96h - Algae [1] | 325 mg/l Pseudokirchneriella subcapitata |
| NOEC chronic fish | ≥ 5.1 mg/l Pimephales promelas (36d), OECD Guideline 210 |
| NOEC chronic crustacea | ≥ 11 mg/l (21d) Daphnia magna |
| NOEC chronic algae | 98 mg/l Species: Pseudokirchneriella subcapitata |
| NOEC, microorganisms | 2000 mg/l |

### 12.2. Persistence and degradability

| Melamine (108-78-1) | |
|---|---|
| Persistence and degradability | Not rapidly degradable |

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| Persistence and degradability | Not readily biodegradable, Not inherently biodegradable. |

### 12.3. Bioaccumulative potential

| Melamine (108-78-1) | |
|---|---|
| Partition coefficient n-octanol/water (Log Kow) | -1.22 (@ 20°C) |

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| BCF fish 1 | < 3.8 l/kg |
| Bioaccumulative potential | Bioaccumulation unlikely. |

### 12.4. Mobility in soil

| 1,3,5-Triazine-2,4,6-triamine (108-78-1) | |
|---|---|
| Organic Carbon Normalized Adsorption Coefficient (Log Koc) | 2.3 |

### 12.5. Results of PBT and vPvB assessment

| Melamine (108-78-1) |
|---|
| This substance does not meet the PBT criteria of UK REACH regulation, annex XIII |
| This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII |

### 12.6. Other adverse effects

Ozone : Not classified (Based on available data, the classification criteria are not met)

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional waste regulation : Dispose in a safe manner in accordance with local/national regulations.
Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations : Recycling is preferred to disposal or incineration. Do not re-use empty containers without proper cleaning or reconditioning. Avoid release to the environment.

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

| ADR | IMDG | IATA | ADN | RID |
|---|---|---|---|---|
| **14.1. UN number** | | | | |
| Not regulated for transport | | | | |
| **14.2. UN proper shipping name** | | | | |
| Not regulated | Not regulated | Not regulated | Not regulated | Not regulated |
| **14.3. Transport hazard class(es)** | | | | |
| Not regulated | Not regulated | Not regulated | Not regulated | Not regulated |
| **14.4. Packing group** | | | | |
| Not regulated | Not regulated | Not regulated | Not regulated | Not regulated |
| **14.5. Environmental hazards** | | | | |
| Not regulated | Not regulated | Not regulated | Not regulated | Not regulated |
| No supplementary information available | | | | |

### 14.6. Special precautions for user

**Overland transport**
Not regulated

**Transport by sea**
Not regulated

**Air transport**
Not regulated

**Inland waterway transport**
Not regulated

**Rail transport**
Not regulated

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

Not applicable

## SECTION 15: Regulatory information

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

#### 15.1.1. National regulations

**UK REACH Annex XVII (Restriction List)**

This substance is not listed on UK REACH Annex XVII (Restriction List)

**UK REACH Annex XIV (Authorisation List)**

This substance is not listed on UK REACH Annex XIV (Authorisation List)

**UK REACH Candidate List (SVHC)**

This substance is not listed on the UK REACH Candidate List (SVHC)

**GB PIC Regulation (Prior Informed Consent)**

This substance is not listed on the GB PIC List

**POP Regulation (Persistent Organic Pollutants)**

This substance is not listed on the GB POP List

**Ozone Regulation (S.I. No. 168 of 2015)**

This substance is not listed on the GB Ozone Depletion List

**Control of Poisons and Explosives Precursors Act**

This substance is not listed as a reportable poison on the Control of Poisons and Explosives Precursors Regulations
This substance is not listed as a regulated poison on the Control of Poisons and Explosives Precursors Regulations
This substance is not listed as a reportable explosive precursor on the Control of Poisons and Explosives Precursors Regulations
This substance is not listed as a regulated poison on the Control of Poisons and Explosives Precursors Regulations

**Drug Precursors Regulation (EC 273/2004)**

This substance is not listed on the GB Drug Precursors List

#### 15.1.2. Other Information

Other information : Listed on the EU REACH Candidate List (SVHC): Melamine.

### 15.2. Chemical safety assessment

A chemical safety assessment has been carried out

## SECTION 16: Other information

**Indication of changes (UK):**
Trade name. Details of the supplier of the safety data sheet.

| Abbreviations and acronyms: | |
|---|---|
| PBT | Persistent Bioaccumulative Toxic |
| vPvB | Very Persistent and Very Bioaccumulative |
| ADR | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| RID | Regulations concerning the International Carriage of Dangerous Goods by Rail |
| ADN | European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways |
| ICAO | International Civil Aviation Organization |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 |
| DNEL | Derived-No Effect Level |
| PNEC | Predicted No-Effect Concentration |
| EC50 | Median effective concentration |
| NOEC | No-Observed Effect Concentration |
| BCF | Bioconcentration factor |
| IMDG | International Maritime Dangerous Goods |
| IATA | International Air Transport Association |
| DMEL | Derived Minimal Effect level |
| CLP | Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 |
| IARC | International Agency for Research on Cancer |
| EC-No. | European Community number |
| EN | European Standard |
| LC50 | Median lethal concentration |
| LD50 | Median lethal dose |
| LOAEL | Lowest Observed Adverse Effect Level |
| OECD | Organisation for Economic Co-operation and Development |
| STP | Sewage treatment plant |
| CAS-No. | Chemical Abstract Service number |
| NOAEL | No-Observed Adverse Effect Level |

Training advice : Training staff on good practice. Ensure staff are informed of and trained on the nature of exposure and basic actions to minimise exposure.

| Full text of H- and EUH-statements: | |
|---|---|
| Carc. 2 | Carcinogenicity, Category 2 |
| Repr. 2 | Reproductive toxicity, Category 2 |
| STOT RE 2 | Specific target organ toxicity – Repeated exposure, Category 2 |
| H351 | Suspected of causing cancer. |
| H361f | Suspected of damaging fertility. |
| H373 | May cause damage to organs (urinary tract) through prolonged or repeated exposure. |

Safety Data Sheet (SDS), UK

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 to the safety data sheet



## 1. ES 1 - ES 1 Manufacture of substances

### 1.1. Title section

| ES 1 Manufacture of substances | |
|---|---|
| ES Ref.: ES 1<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Manufacture of substances | ERC1 |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions | PROC1 |
| CS 3 | Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions | PROC2 |
| CS 4 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 5 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 6 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 7 | Use as laboratory reagent | PROC15 |
| CS 8 | Manual maintenance (cleaning and repair) of machinery | PROC28 |

## 1.2. Conditions of use affecting exposure

### 1.2.1. Control of environmental exposure: Manufacture of substances (ERC1)

| | |
|---|---|
| ERC1 | Manufacture of the substance |

### 1.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 1.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 1.2.4. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 1.2.5. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 1.2.6. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 1.2.7. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Assumes process temperature up to | 40 °C |
| Indoor use | |

#### 1.2.8. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Assumes process temperature up to | 40 °C |
| Indoor use | |

### 1.3. Exposure estimation and reference to its source

#### 1.3.1. Environmental release and exposure Manufacture of substances (ERC1)

| Information for contributing exposure scenario |
|---|
| Confidential |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Non-agricultural soil | 0 % | |

### 1.3.2. Worker exposure Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.034 mg/kg bw/day | < 0.01 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.01 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | < 0.02 | |
| Inhalation - Acute - systemic effects | 0.04 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 1.3.3. Worker exposure Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.37 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.176 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 1.3.4. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 1.3.5. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 1.3.6. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 1.3.7. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 1.3.8. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario |
|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | 0.243 | |

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

### 1.4.1. Environment

| | |
|---|---|
| Guidance - Environment | Not applicable. |

### 1.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 2. ES 2 - ES 2 Formulation or re-packing

### 2.1. Title section

| ES 2 Formulation or re-packing | |
|---|---|
| ES Ref.: ES 2<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Formulation into mixture | ERC2 |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions | PROC2 |
| CS 3 | Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC3 |
| CS 4 | Chemical production where opportunity for exposure arises | PROC4 |
| CS 5 | Mixing or blending in batch processes | PROC5 |
| CS 6 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 7 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 8 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 9 | Tabletting, compression, extrusion, pelettisation, granulation | PROC14 |
| CS 10 | Use as laboratory reagent | PROC15 |
| CS 11 | Manual activities involving hand contact | PROC19 |
| CS 12 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 13 | Mixing or blending in batch processes | PROC5 |
| CS 14 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 15 | Use as laboratory reagent | PROC15 |
| CS 16 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 17 | Manual activities involving hand contact | PROC19 |
| CS 18 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |

## 2.2. Conditions of use affecting exposure

### 2.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

| | |
|---|---|
| ERC2 | Formulation into mixture |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 2.2.2. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.3. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.4. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

| | |
|---|---|
| PROC4 | Chemical production where opportunity for exposure arises |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.5. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.6. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.7. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |

| Other conditions affecting workers exposure | |
|---|---|
| Assumes process temperature up to | 40 °C |

### 2.2.8. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.9. Control of worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

| | |
|---|---|
| PROC14 | Tabletting, compression, extrusion, pelettisation, granulation |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.10. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.11. Control of worker exposure: Manual activities involving hand contact (PROC19)

| | |
|---|---|
| PROC19 | Manual activities involving hand contact |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |

| Product (article) characteristics | |
|---|---|
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Avoid carrying out operation for more than 4 hours,Covers exposure up to: | ≤ 4 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least: | 95 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 2.2.13. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 2.2.14. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 2.2.15. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 2.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 2.2.17. Control of worker exposure: Manual activities involving hand contact (PROC19)

| | |
|---|---|
| PROC19 | Manual activities involving hand contact |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least: | 95 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m³ |

### 2.2.18. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |

| Other conditions affecting workers exposure | |
|---|---|
| Assumes process temperature up to | ≤ 115 °C |

## 2.3. Exposure estimation and reference to its source

### 2.3.1. Environmental release and exposure Formulation into mixture (ERC2)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.248 mg/l | 0.51 mg/l | 0.49 | EUSES 2.2.0 |
| Marine water | 0.025 mg/l | 0.051 mg/l | < 0.5 | EUSES 2.2.0 |
| Secondary poisoning | | | 0.06 | EUSES 2.2.0 |
| Freshwater sediment | 6.348 mg/kg dwt | 13.06 mg/kg dwt | 0.49 | EUSES 2.2.0 |
| Marine water sediment | 0.652 mg/kg dwt | 1.306 mg/kg dwt | 0.5 | EUSES 2.2.0 |
| Sewage treatment plant | 2.431 mg/l | 100 mg/l | 0.02 | EUSES 2.2.0 |
| Soil | 1.7 mg/kg wet weight | 2.312 mg/kg dwt | 0.75 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 5 kg/day | |
| Release estimation | Air | 1 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 2.3.2. Worker exposure Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Route of exposure and type of effects | Exposure estimate: | RCR | Method |
| Dermal - Long-term - systemic effects | 1.37 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Long-term - systemic effects | | 0.176 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 2.3.3. Worker exposure Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.69 mg/kg bw/day | 0.058 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.178 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 2.3.4. Worker exposure Chemical production where opportunity for exposure arises (PROC4)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.5. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.6. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.7. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 2.3.8. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.9. Worker exposure Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 3.43 mg/kg bw/day | 0.291 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.411 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 2.3.10. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 2.3.11. Worker exposure Manual activities involving hand contact (PROC19)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 7.072 mg/kg bw/day | 0.599 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3 mg/m³ | 0.361 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.96 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.12. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario |
|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 2.3.13. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 2.3.14. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 2.3.15. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.092 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 2.3.16. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 2.3.17. Worker exposure Manual activities involving hand contact (PROC19)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 7.072 mg/kg bw/day | 0.599 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1.74 mg/m³ | 0.21 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.809 | |
| Inhalation - Acute - systemic effects | 1.74 mg/m³ | 0.021 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.021 | |

### 2.3.18. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

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

### 2.4.1. Environment

No data available

### 2.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 3. ES 3 - ES 3 Use at industrial sites - Use as monomer (intermediate) for melamine based resins production

### 3.1. Title section

| ES 3 Use at industrial sites - Use as monomer (intermediate) for melamine based resins production | |
|---|---|
| ES Ref.: ES 3<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Use of intermediate, Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) | ERC6a, ERC6c |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions | PROC1 |
| CS 3 | Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions | PROC2 |
| CS 4 | Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC3 |
| CS 5 | Chemical production where opportunity for exposure arises | PROC4 |
| CS 6 | Mixing or blending in batch processes | PROC5 |
| CS 7 | Calendering operations | PROC6 |
| CS 8 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 9 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 10 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 11 | Tabletting, compression, extrusion, pelettisation, granulation | PROC14 |
| CS 12 | Use as laboratory reagent | PROC15 |
| CS 13 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 14 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 15 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 16 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |

## 3.2. Conditions of use affecting exposure

### 3.2.1. Control of environmental exposure: Use of intermediate, Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6a, ERC6c)

| | |
|---|---|
| ERC6a | Use of intermediate |
| ERC6c | Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 100 % |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 3.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

| | |
|---|---|
| PROC4 | Chemical production where opportunity for exposure arises |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.7. Control of worker exposure: Calendering operations (PROC6)

| | |
|---|---|
| PROC6 | Calendering operations |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Efficiency of at least: | 90 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.8. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.9. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |

| Technical and organisational conditions and measures | |
|---|---|
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.10. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.11. Control of worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

| | |
|---|---|
| PROC14 | Tabletting, compression, extrusion, pelettisation, granulation |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.12. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.13. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 3.2.14. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 3.2.15. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 3.2.16. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

## 3.3. Exposure estimation and reference to its source

### 3.3.1. Environmental release and exposure Use of intermediate, Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6a, ERC6c)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.151 mg/l | 0.51 mg/l | 0.3 | EUSES 2.2.0 |
| Marine water | 0.015 mg/l | 0.051 mg/l | 0.29 | EUSES 2.2.0 |
| Secondary poisoning | | | 0.03 | EUSES 2.2.0 |
| Freshwater sediment | 3.86 mg/kg dwt | 13.06 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Marine water sediment | 0.396 mg/kg dwt | 1.306 mg/kg dwt | 0.3 | EUSES 2.2.0 |

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Sewage treatment plant | 1.458 mg/l | 100 mg/l | < 0.02 | EUSES 2.2.0 |
| Soil | 1.014 mg/kg dwt | 2.312 mg/kg dwt | 0.44 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 3 kg/day | |
| Release estimation | Air | 0.5 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 3.3.2. Worker exposure Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.034 mg/kg bw/day | < 0.01 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.01 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | < 0.02 | |
| Inhalation - Acute - systemic effects | 0.04 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 3.3.3. Worker exposure Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.37 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.176 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 3.3.4. Worker exposure Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.69 mg/kg bw/day | 0.058 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.178 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 3.3.5. Worker exposure Chemical production where opportunity for exposure arises (PROC4)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.6. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.7. Worker exposure Calendering operations (PROC6)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.8. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.9. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 3.3.10. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.11. Worker exposure Tabletting, compression, extrusion, pelettisation, granulation (PROC14)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 3.43 mg/kg bw/day | 0.291 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.411 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 3.3.12. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 3.3.13. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1 |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 3.3.14. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.735 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 3.3.15. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.735 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 3.3.16. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 4.114 mg/kg bw/day | 0.349 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.387 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Acute - systemic effects | | < 0.01 | |

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

### 3.4.1. Environment

No data available

### 3.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 4. ES 4 - ES 4 Use at industrial sites - Use as monomer (intermediate) in melamine based resins before curing

### 4.1. Title section

| ES 4 Use at industrial sites - Use as monomer (intermediate) in melamine based resins before curing | |
|---|---|
| ES Ref.: ES 4<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS1 | Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) | ERC6c |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze | PROC7 |
| CS 3 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 4 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 5 | Handling of liquids on large surfaces or large work pieces | PROC10 |
| CS 6 | Handling of liquids using low pressure, low speed or on medium-sized surfaces | PROC19 |
| CS 7 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 8 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 9 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 10 | Calendering operations | PROC6 |

### 4.2. Conditions of use affecting exposure

#### 4.2.1. Control of environmental exposure: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

| | |
|---|---|
| ERC6c | Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 100 % |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

#### 4.2.2. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC7)

| | |
|---|---|
| PROC7 | Industrial spraying |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |

#### 4.2.3. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

#### 4.2.4. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | 0.016 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 120 °C |

| Other conditions affecting workers exposure | |
|---|---|
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |

#### 4.2.5. Control of worker exposure: Handling of liquids on large surfaces or large work pieces (PROC10)

| | |
|---|---|
| PROC10 | Roller application or brushing |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

#### 4.2.6. Control of worker exposure: Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

| | |
|---|---|
| PROC19 | Manual activities involving hand contact |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 90 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

#### 4.2.7. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

#### 4.2.8. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 10 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 4.2.9. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 4.2.10. Control of worker exposure: Calendering operations (PROC6)

| | |
|---|---|
| PROC6 | Calendering operations |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 10 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

## 4.3. Exposure estimation and reference to its source

### 4.3.1. Environmental release and exposure Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6c)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.029 mg/l | 0.51 mg/l | 0.06 | EUSES 2.2.0 |
| Marine water | 0.00298 mg/l | 0.051 mg/l | 0.06 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.75 mg/kg dwt | 13.06 mg/kg dwt | 0.06 | EUSES 2.2.0 |
| Marine water sediment | 0.076 mg/kg dwt | 1.306 mg/kg dwt | 0.06 | EUSES 2.2.0 |
| Sewage treatment plant | 0.243 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0.164 mg/kg dwt | 2.312 mg/kg dwt | 0.07 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0.5 kg/day | |
| Release estimation | Air | 0 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 4.3.2. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC7)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 5.143 mg/kg bw/day | 0.436 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3.85 mg/m³ | 0.464 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.9 | |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Acute - systemic effects | 3.85 mg/m³ | 0.05 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.05 | |

#### 4.3.3. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.735 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 4.3.4. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.38 mg/m³ | 0.046 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.743 | |
| Inhalation - Acute - systemic effects | 0.38 mg/m³ | < 0.01 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 4.3.5. Worker exposure Handling of liquids on large surfaces or large work pieces (PROC10)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 3.29 mg/kg bw/day | 0.279 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1.74 mg/m³ | 0.21 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.489 | |
| Inhalation - Acute - systemic effects | 1.74 mg/m³ | 0.021 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.021 | |

#### 4.3.6. Worker exposure Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.486 mg/kg bw/day | 0.719 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.84 mg/m³ | 0.101 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.82 | |
| Inhalation - Acute - systemic effects | 0.84 mg/m³ | 0.01 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.01 | |

#### 4.3.7. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.735 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 4.3.8. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.645 mg/kg bw/day | 0.139 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3 mg/m³ | 0.361 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.5 | |
| Inhalation - Acute - systemic effects | 12 mg/m³ | 0.146 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.146 | |

#### 4.3.9. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.226 mg/kg bw/day | 0.697 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.6 mg/m³ | 0.072 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.769 | |
| Inhalation - Acute - systemic effects | 2.4 mg/m³ | 0.029 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.029 | |

#### 4.3.10. Worker exposure Calendering operations (PROC6)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 3.291 mg/kg bw/day | 0.279 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.315 mg/m³ | 0.038 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.317 | |
| Inhalation - Acute - systemic effects | 0.315 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

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

#### 4.4.1. Environment

No data available

#### 4.4.2. Health

No data available

## 5. ES 5 - ES 5 Use at industrial sites - Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine)

### 5.1. Title section

| ES 5 Use at industrial sites - Use as intermediate for the production of other substances e.g. melamine salt (reacted melamine) | |
|---|---|
| ES Ref.: ES 5<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Use of intermediate | ERC6a |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions | PROC1 |
| CS 3 | Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions | PROC2 |
| CS 4 | Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC3 |
| CS 5 | Chemical production where opportunity for exposure arises | PROC4 |
| CS 6 | Mixing or blending in batch processes | PROC5 |
| CS 7 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 8 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 9 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 10 | Use as laboratory reagent | PROC15 |
| CS 11 | Manual maintenance (cleaning and repair) of machinery | PROC28 |

### 5.2. Conditions of use affecting exposure

#### 5.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

| | |
|---|---|
| ERC6a | Use of intermediate |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 5.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |

| Technical and organisational conditions and measures | |
|---|---|
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

| | |
|---|---|
| PROC4 | Chemical production where opportunity for exposure arises |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |

| Product (article) characteristics | |
|---|---|
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 5.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.7. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.8. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 5.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.10. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 5.2.11. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

## 5.3. Exposure estimation and reference to its source

### 5.3.1. Environmental release and exposure Use of intermediate (ERC6a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.151 mg/l | 0.51 mg/l | 0.3 | EUSES 2.2.0 |
| Marine water | 0.015 mg/l | 0.051 mg/l | 0.29 | EUSES 2.2.0 |
| Secondary poisoning | | | 0.03 | EUSES 2.2.0 |
| Freshwater sediment | 3.86 mg/kg dwt | 13.06 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Marine water sediment | 0.396 mg/kg dwt | 1.306 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Sewage treatment plant | 1.485 mg/l | 100 mg/l | < 0.02 | EUSES 2.2.0 |
| Soil | 1.014 mg/kg dwt | 2.312 mg/kg dwt | 0.44 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 3 kg/day | |
| Release estimation | Air | 0.5 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 5.3.2. Worker exposure Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.034 mg/kg bw/day | < 0.01 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.01 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | < 0.02 | |
| Inhalation - Acute - systemic effects | 0.04 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 5.3.3. Worker exposure Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.37 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.176 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 5.3.4. Worker exposure Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.69 mg/kg bw/day | 0.058 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.178 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 5.3.5. Worker exposure Chemical production where opportunity for exposure arises (PROC4)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 5.3.6. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 5.3.7. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

#### 5.3.8. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

#### 5.3.9. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

#### 5.3.10. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

#### 5.3.11. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario |
|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1,ECETOC TRA |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1,ECETOC TRA |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1,ECETOC TRA |
| Sum RCR - Acute - systemic effects | | 0.243 | |

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

### 5.4.1. Environment

No data available

### 5.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 6. ES 6 - ES 6 Use at industrial sites - Use as additive in foams

### 6.1. Title section

| ES 6 Use at industrial sites - Use as additive in foams | |
|---|---|
| ES Ref.: ES 6<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Use at industrial site leading to inclusion into/onto article | ERC5 |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions | PROC1 |
| CS 3 | Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions | PROC2 |
| CS 4 | Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC3 |
| CS 5 | Chemical production where opportunity for exposure arises | PROC4 |
| CS 6 | Mixing or blending in batch processes | PROC5 |
| CS 7 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 8 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 9 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 10 | Use as laboratory reagent | PROC15 |
| CS 11 | Manual activities involving hand contact | PROC19 |
| CS 12 | Manual maintenance (cleaning and repair) of machinery | PROC28 |

### 6.2. Conditions of use affecting exposure

#### 6.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

| | |
|---|---|
| ERC5 | Use at industrial site leading to inclusion into/onto article |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 6.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.3. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.4. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.5. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

| | |
|---|---|
| PROC4 | Chemical production where opportunity for exposure arises |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.6. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.7. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.8. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.10. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 6.2.11. Control of worker exposure: Manual activities involving hand contact (PROC19)

| | |
|---|---|
| PROC19 | Manual activities involving hand contact |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Avoid carrying out operation for more than 4 hours,Covers exposure up to: | ≤ 4 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least: | 95 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 6.2.12. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

## 6.3. Exposure estimation and reference to its source

### 6.3.1. Environmental release and exposure Use at industrial site leading to inclusion into/onto article (ERC5)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.151 mg/l | 0.51 mg/l | 0.3 | EUSES 2.2.0 |
| Marine water | 0.015 mg/l | 0.051 mg/l | 0.29 | EUSES 2.2.0 |
| Secondary poisoning | | | 0.03 | EUSES 2.2.0 |
| Freshwater sediment | 3.86 mg/kg dwt | 13.06 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Marine water sediment | 0.396 mg/kg dwt | 1.306 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Sewage treatment plant | 1.458 mg/l | 100 mg/l | < 0.02 | EUSES 2.2.0 |
| Soil | 1.014 mg/kg dwt | 2.312 mg/kg dwt | 0.44 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 3 kg/day | |
| Release estimation | Air | 0.5 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 6.3.2. Worker exposure Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.034 mg/kg bw/day | < 0.01 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.01 mg/m³ | TRA Workers 0.01 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | < 0.02 | |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Acute - systemic effects | 0.04 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 6.3.3. Worker exposure Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.37 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.176 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 6.3.4. Worker exposure Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.69 mg/kg bw/day | 0.058 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.178 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 6.3.5. Worker exposure Chemical production where opportunity for exposure arises (PROC4)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 6.3.6. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 6.3.7. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | Measured data |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 6.3.8. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 6.3.9. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 6.3.10. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 6.3.11. Worker exposure Manual activities involving hand contact (PROC19)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 7.072 mg/kg bw/day | 0.599 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3 mg/m³ | 0.361 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.96 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | Measured data |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 6.3.12. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario |
|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | 0.243 | |

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

### 6.4.1. Environment

No data available

### 6.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 7. ES 7 - ES 7 Use at industrial sites - Use as additive in intumescent coatings

### 7.1. Title section

| ES 7 Use at industrial sites - Use as additive in intumescent coatings | |
|---|---|
| ES Ref.: ES 7<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Use at industrial site leading to inclusion into/onto article | ERC5 |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition | PROC3 |
| CS 3 | Chemical production where opportunity for exposure arises | PROC4 |
| CS 4 | Mixing or blending in batch processes | PROC5 |
| CS 5 | Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - With LEV | PROC7 |
| CS 6 | Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - Without LEV | PROC7 |
| CS 7 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 8 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 9 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 10 | Handling of liquids on large surfaces or large work pieces | PROC10 |
| CS 11 | Treatment of articles by dipping and pouring | PROC13 |
| CS 12 | Use as laboratory reagent | PROC15 |
| CS 13 | Handling of liquids using low pressure, low speed or on medium-sized surfaces | PROC19 |
| CS 14 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 15 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 16 | Manual maintenance (cleaning and repair) of machinery | PROC28 |
| CS 17 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |

## 7.2. Conditions of use affecting exposure

### 7.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

| | |
|---|---|
| ERC5 | Use at industrial site leading to inclusion into/onto article |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 7.2.2. Control of worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.3. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4)

| | |
|---|---|
| PROC4 | Chemical production where opportunity for exposure arises |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.4. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.5. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - With LEV (PROC7)

| | |
|---|---|
| PROC7 | Industrial spraying |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation - efficiency of at least [%]: | 95 %<br>Inhalation. Effectiveness Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 7.2.6. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - Without LEV (PROC7)

| | |
|---|---|
| PROC7 | Industrial spraying |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Wear suitable respiratory protection. APF=10. Inhalation - minimum efficiency of | 90 %<br>For further specification, refer to section 8 of the SDS. |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 7.2.7. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.8. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |

| Other conditions affecting workers exposure | |
|---|---|
| Assumes process temperature up to | 40 °C |

### 7.2.9. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.10. Control of worker exposure: Handling of liquids on large surfaces or large work pieces (PROC10)

| | |
|---|---|
| PROC10 | Roller application or brushing |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 7.2.11. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

| | |
|---|---|
| PROC13 | Treatment of articles by dipping and pouring |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 7.2.12. Control of worker exposure: Use as laboratory reagent (PROC15)

| | |
|---|---|
| PROC15 | Use as laboratory reagent |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 7.2.13. Control of worker exposure: Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

| | |
|---|---|
| PROC19 | Manual activities involving hand contact |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |

| Technical and organisational conditions and measures | |
|---|---|
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Efficiency of at least: | 95 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 7.2.14. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 7.2.15. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

#### 7.2.16. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 7.2.17. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

## 7.3. Exposure estimation and reference to its source

### 7.3.1. Environmental release and exposure Use at industrial site leading to inclusion into/onto article (ERC5)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.151 mg/l | 0.51 mg/l | 0.3 | EUSES 2.2.0 |
| Marine water | 0.015 mg/l | 0.051 mg/l | 0.29 | EUSES 2.2.0 |
| Secondary poisoning | | | 0.03 | EUSES 2.2.0 |
| Freshwater sediment | 3.86 mg/kg dwt | 13.06 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Marine water sediment | 0.396 mg/kg dwt | 1.306 mg/kg dwt | 0.3 | EUSES 2.2.0 |
| Sewage treatment plant | 1.458 mg/l | 100 mg/l | 0.02 | EUSES 2.2.0 |
| Soil | 1.014 mg/kg dwt | 2.312 mg/kg dwt | 0.44 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 3 kg/day | |
| Release estimation | Air | 0.5 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

### 7.3.2. Worker exposure Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.69 mg/kg bw/day | 0.058 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.178 | |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | Measured data |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 7.3.3. Worker exposure Chemical production where opportunity for exposure arises (PROC4)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 7.3.4. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 7.3.5. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - With LEV (PROC7)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.572 mg/kg bw/day | 0.726 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.4 mg/m³ | 0.048 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.774 | |
| Inhalation - Acute - systemic effects | 0.4 mg/m³ | < 0.01 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 7.3.6. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze - Without LEV (PROC7)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 8.572 mg/kg bw/day | 0.726 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.795 mg/m³ | 0.096 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.822 | |
| Inhalation - Acute - systemic effects | 0.795 mg/m³ | < 0.01 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 7.3.7. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 7.3.8. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.352 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

### 7.3.9. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 1.372 mg/kg bw/day | 0.116 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.718 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 7.3.10. Worker exposure Handling of liquids on large surfaces or large work pieces (PROC10)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 5.486 mg/kg bw/day | 0.465 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3.59 mg/m³ | 0.433 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.898 | |
| Inhalation - Acute - systemic effects | 3.59 mg/m³ | 0.044 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.044 | |

### 7.3.11. Worker exposure Treatment of articles by dipping and pouring (PROC13)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 7.3.12. Worker exposure Use as laboratory reagent (PROC15)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.34 mg/kg bw/day | 0.029 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Long-term - systemic effects | 0.5 mg/m³ | 0.06 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.089 | |
| Inhalation - Acute - systemic effects | 2 mg/m³ | 0.024 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.024 | |

### 7.3.13. Worker exposure Handling of liquids using low pressure, low speed or on medium-sized surfaces (PROC19)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 7.072 mg/kg bw/day | 0.599 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1.74 mg/m³ | 0.21 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.809 | |
| Inhalation - Acute - systemic effects | 1.74 mg/m³ | 0.021 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.021 | |

### 7.3.14. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.834 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | 0.243 | |

### 7.3.15. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 7.3.16. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 7.3.17. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

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

#### 7.4.1. Environment

No data available

#### 7.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 8. ES 8 - ES 8 Widespread use by professional workers - Use as additive in intumescent coatings

### 8.1. Title section

| ES 8 Widespread use by professional workers - Use as additive in intumescent coatings | |
|---|---|
| ES Ref.: ES 8<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor) | ERC8c, ERC8f |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Mixing or blending in batch processes | PROC5 |
| CS 3 | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities | PROC8a |
| CS 4 | Transfer of substance or mixture (charging and discharging) at dedicated facilities | PROC8b |
| CS 5 | Transfer of substance or mixture into small containers (dedicated filling line, including weighing) | PROC9 |
| CS 6 | Handling of liquids on large surfaces or large work pieces | PROC10 |
| CS 7 | Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze | PROC11 |
| CS 8 | Treatment of articles by dipping and pouring | PROC13 |
| CS 9 | Manual maintenance (cleaning and repair) of machinery | PROC28 |

### 8.2. Conditions of use affecting exposure

#### 8.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor) (ERC8c, ERC8f)

| | |
|---|---|
| ERC8c | Widespread use leading to inclusion into/onto article (indoor) |
| ERC8f | Widespread use leading to inclusion into/onto article (outdoor) |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

### 8.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5)

| | |
|---|---|
| PROC5 | Mixing or blending in batch processes |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 8.2.3. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| | |
|---|---|
| PROC8a | Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.115 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

#### 8.2.4. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| | |
|---|---|
| PROC8b | Transfer of substance or mixture (charging and discharging) at dedicated facilities |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 8.2.5. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| | |
|---|---|
| PROC9 | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 8.2.6. Control of worker exposure: Handling of liquids on large surfaces or large work pieces (PROC10)

| | |
|---|---|
| PROC10 | Roller application or brushing |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide enhanced general ventilation by mechanical means | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |
| Ensure regular inspection, cleaning and maintenance of equipment and machines. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 8.2.7. Control of worker exposure: Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC11)

| | |
|---|---|
| PROC11 | Non industrial spraying |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Task is followed by a period of evaporation, drying or curing | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable respiratory protection. Inhalation - minimum efficiency of | 95 %<br>For further specification, refer to section 8 of the SDS. |
| Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Efficiency of at least: | 90 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |
| Use in room with a volume of minimum 100 m3. | 100 - 1000 m3 |

| Other conditions affecting workers exposure | |
|---|---|
| Distance to task: In the breathing zone of the worker (<1 meter) | < 1 m<br>distance head-product |

### 8.2.8. Control of worker exposure: Treatment of articles by dipping and pouring (PROC13)

| | |
|---|---|
| PROC13 | Treatment of articles by dipping and pouring |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

### 8.2.9. Control of worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC28)

| | |
|---|---|
| PROC28 | Manual maintenance (cleaning and repair) of machinery |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Liquid |
| Concentration of substance in product | ≤ 30 % |
| Vapour pressure | < 0.01 Pa |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Wear suitable gloves tested to EN374. Efficiency of at least: | 80 %<br>For further specification, refer to section 8 of the SDS. |
| If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands. | |
| Respiratory protection | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | ≤ 115 °C |

## 8.3. Exposure estimation and reference to its source

### 8.3.1. Environmental release and exposure Widespread use leading to inclusion into/onto article (indoor), Widespread use leading to inclusion into/onto article (outdoor) (ERC8c, ERC8f)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |
| Marine water | 0.000482 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.012 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg dwt | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Non-agricultural soil | 0 % | |

#### 8.3.2. Worker exposure Mixing or blending in batch processes (PROC5)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 8.3.3. Worker exposure Transfer of substance or mixture (charging and discharging) at non-dedicated facilities (PROC8a)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 8.3.4. Worker exposure Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC8b)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.742 mg/kg bw/day | 0.232 | Measured data |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | Measured data |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 8.3.5. Worker exposure Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 6.86 mg/kg bw/day | 0.581 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.644 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 8.3.6. Worker exposure Handling of liquids on large surfaces or large work pieces (PROC10)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 5.486 mg/kg bw/day | 0.465 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3.61 mg/m³ | 0.435 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.9 | |
| Inhalation - Acute - systemic effects | 3.61 mg/m³ | 0.044 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | 0.044 | |

### 8.3.7. Worker exposure Handling of liquids at high pressure resulting in substantial generation of mist or spray/haze (PROC11)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 10.71 mg/kg bw/day | 0.908 | TRA Workers |
| Inhalation - Long-term - systemic effects | 0.398 mg/m³ | 0.048 | Stoffenmanager v8 |
| Sum RCR - Long-term - systemic effects | | 0.956 | |
| Inhalation - Acute - systemic effects | 0.398 mg/m³ | < 0.01 | Stoffenmanager v8 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

### 8.3.8. Worker exposure Treatment of articles by dipping and pouring (PROC13)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers |

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

#### 8.3.9. Worker exposure Manual maintenance (cleaning and repair) of machinery (PROC28)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Exposure estimate: PROC 8a, TRA Workers v3.1 | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.743 mg/kg bw/day | 0.232 | TRA Workers v3.1 |
| Inhalation - Long-term - systemic effects | 0.525 mg/m³ | 0.063 | TRA Workers v3.1 |
| Sum RCR - Long-term - systemic effects | | 0.295 | |
| Inhalation - Acute - systemic effects | 0.525 mg/m³ | < 0.01 | TRA Workers v3.1 |
| Sum RCR - Acute - systemic effects | | < 0.01 | |

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

#### 8.4.1. Environment

No data available

#### 8.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 9. ES 9 - ES 9 Service life - workers - PU foams - Workers (industrial)

### 9.1. Title section

| ES 9 Service life - workers - PU foams - Workers (industrial) | |
|---|---|
| ES Ref.: ES 9<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Processing of articles at industrial sites with low release | ERC12a |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Low energy manipulation and handling of substances bound in/on materials or articles | PROC21 |
| CS 2 | High (mechanical) energy work-up of substances bound in/on materials and/or articles | PROC24 |

### 9.2. Conditions of use affecting exposure

#### 9.2.1. Control of environmental exposure: Processing of articles at industrial sites with low release (ERC12a)

| | |
|---|---|
| ERC12a | Processing of articles at industrial sites with low release |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

#### 9.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 9.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

| | |
|---|---|
| PROC24 | High (mechanical) energy work-up of substances bound in/on materials and/or articles |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 9.3. Exposure estimation and reference to its source

#### 9.3.1. Environmental release and exposure Processing of articles at industrial sites with low release (ERC12a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Marine water | 0.000387 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.0099 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg dwt | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

#### 9.3.2. Worker exposure Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.83 mg/kg bw/day | 0.24 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3 mg/m³ | 0.361 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.601 | |
| Inhalation - Acute - systemic effects | 12 mg/m³ | 0.146 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.146 | |

#### 9.3.3. Worker exposure High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.83 mg/kg bw/day | 0.24 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.36 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

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

#### 9.4.1. Environment

No data available

#### 9.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 10. ES 10 - ES 10 Service life - workers - Intumescent coatings - Workers (industrial)

### 10.1. Title section

| ES 10 Service life - workers - Intumescent coatings - Workers (industrial) | |
|---|---|
| ES Ref.: ES 10<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Processing of articles at industrial sites with low release | ERC12a |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Low energy manipulation and handling of substances bound in/on materials or articles | PROC21 |
| CS 2 | High (mechanical) energy work-up of substances bound in/on materials and/or articles | PROC24 |

### 10.2. Conditions of use affecting exposure

#### 10.2.1. Control of environmental exposure: Processing of articles at industrial sites with low release (ERC12a)

| | |
|---|---|
| ERC12a | Processing of articles at industrial sites with low release |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

#### 10.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

#### 10.2.3. Control of worker exposure: High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

| | |
|---|---|
| PROC24 | High (mechanical) energy work-up of substances bound in/on materials and/or articles |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

### 10.3. Exposure estimation and reference to its source

#### 10.3.1. Environmental release and exposure Processing of articles at industrial sites with low release (ERC12a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Marine water | 0.000482 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.012 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg dwt | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

**10.3.2. Worker exposure Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)**

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.83 mg/kg bw/day | 0.24 | TRA Workers |
| Inhalation - Long-term - systemic effects | 3 mg/m³ | 0.361 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.601 | |
| Inhalation - Acute - systemic effects | 12 mg/m³ | 0.146 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.146 | |

#### 10.3.3. Worker exposure High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.83 mg/kg bw/day | 0.24 | TRA Workers |
| Inhalation - Long-term - systemic effects | 1 mg/m³ | 0.12 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.36 | |
| Inhalation - Acute - systemic effects | 4 mg/m³ | 0.049 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.049 | |

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

#### 10.4.1. Environment

No data available

#### 10.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 11. ES 11 - ES 11 Service life - workers - Intumescent coatings - Professional Workers

### 11.1. Title section

| ES 11 Service life - workers - Intumescent coatings - Professional Workers | |
|---|---|
| ES Ref.: ES 11<br>ES Type: Worker | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) | ERC10a, ERC11a |

| Worker | | Use descriptors |
|---|---|---|
| CS 2 | Low energy manipulation and handling of substances bound in/on materials or articles | PROC21 |

### 11.2. Conditions of use affecting exposure

#### 11.2.1. Control of environmental exposure: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| | |
|---|---|
| ERC10a | Widespread use of articles with low release (outdoor) |
| ERC11a | Widespread use of articles with low release (indoor) |

| Conditions and measures related to sewage treatment plant | |
|---|---|
| Municipal Sewage Treatment Plant | 2.77 %<br>effectiveness water |
| Discharge of sewage treatment plant (STP) | ≥ 2000 m³/d |
| Controlled application of sewage sludge to agricultural soil | Yes |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

#### 11.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)

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

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 100 % |
| Dustiness | Solid, medium dustiness |

| Amount used (or contained in articles), frequency and duration of use/exposure | |
|---|---|
| Exposure duration | ≤ 8 h/day |

| Technical and organisational conditions and measures | |
|---|---|
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). | |
| Local exhaust ventilation | No. Effectiveness Inhalation: 0%, Dermal: 0% |

| Technical and organisational conditions and measures | |
|---|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. | |

| Conditions and measures related to personal protection, hygiene and health evaluation | |
|---|---|
| Respiratory protection | No. Effectiveness : 0% |
| Protective gloves | No. Effectiveness : 0% |

| Other conditions affecting workers exposure | |
|---|---|
| Indoor use | |
| Assumes process temperature up to | 40 °C |

## 11.3. Exposure estimation and reference to its source

### 11.3.1. Environmental release and exposure Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |
| Marine water | 0.000482 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.012 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg bw/day | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Non-agricultural soil | 0 % | |

#### 11.3.2. Worker exposure Low energy manipulation and handling of substances bound in/on materials or articles (PROC21)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 2.83 mg/kg bw/day | 0.24 | TRA Workers |
| Inhalation - Long-term - systemic effects | 5 mg/m³ | 0.602 | TRA Workers |
| Sum RCR - Long-term - systemic effects | | 0.842 | |
| Inhalation - Acute - systemic effects | 20 mg/m³ | 0.243 | TRA Workers |
| Sum RCR - Acute - systemic effects | | 0.243 | |

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

#### 11.4.1. Environment

No data available

#### 11.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 12. ES 12 - ES 12 Service life - consumers - PU foams – Consumers

### 12.1. Title section

| ES 12 Service life - consumers - PU foams – Consumers | |
|---|---|
| ES Ref.: ES 12<br>ES Type: Consumer | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) | ERC10a, ERC11a |

| Consumer | | Use descriptors |
|---|---|---|
| CS 2.1 | Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Babies | AC1, AC1a, AC13, AC13e |
| CS 2.2 | Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Adult | AC1, AC1a, AC13, AC13e |

### 12.2. Conditions of use affecting exposure

#### 12.2.1. Control of environmental exposure: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| | |
|---|---|
| ERC10a | Widespread use of articles with low release (outdoor) |
| ERC11a | Widespread use of articles with low release (indoor) |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow ($m^3$/day): | ≥ 18000 $m^3$/d |

#### 12.2.2. Control of consumer exposure: Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Babies (AC1, AC1a, AC13, AC13e)

| | |
|---|---|
| AC1 | Vehicles |
| AC1a | Vehicles covered by End of Life Vehicles (ELV) directive |
| AC13 | Plastic articles |
| AC13e | Plastic articles: Furniture & furnishings, including furniture coverings |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 30 % |

| Other conditions affecting consumer exposure | |
|---|---|
| Inhalation exposure is considered to be not relevant. | |
| Oral exposure is considered to be not relevant. | |

#### 12.2.3. Control of consumer exposure: Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Adult (AC1, AC1a, AC13, AC13e)

| | |
|---|---|
| AC1 | Vehicles |
| AC1a | Vehicles covered by End of Life Vehicles (ELV) directive |

| | |
|---|---|
| AC13 | Plastic articles |
| AC13e | Plastic articles: Furniture & furnishings, including furniture coverings |

| Product (article) characteristics | |
|---|---|
| Concentration of substance in product | ≤ 30 % |

| Other conditions affecting consumer exposure | |
|---|---|
| Inhalation exposure is considered to be not relevant. | |
| Oral exposure is considered to be not relevant. | |

## 12.3. Exposure estimation and reference to its source

### 12.3.1. Environmental release and exposure Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |
| Marine water | 0.000482 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.012 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg dwt | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

#### 12.3.2. Consumer exposure Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Babies (AC1, AC1a, AC13, AC13e)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation exposure is considered to be not relevant,Oral exposure is considered to be not relevant. | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.1484 mg/kg bw/day | 0.035 | Babies,Based on migration study |
| Sum RCR - Long-term - systemic effects | | 0.035 | |

#### 12.3.3. Consumer exposure Vehicles, Vehicles covered by End of Life Vehicles (ELV) directive, Plastic articles, Plastic articles: Furniture & furnishings, including furniture coverings, Adult (AC1, AC1a, AC13, AC13e)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation exposure is considered to be not relevant,Oral exposure is considered to be not relevant. | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Dermal - Long-term - systemic effects | 0.06375 mg/kg bw/day | 0.015 | Adult,Based on migration study |
| Sum RCR - Long-term - systemic effects | | 0.015 | |

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

#### 12.4.1. Environment

No data available

#### 12.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |

## 13. ES 13 - ES 13 Service life - consumers - Intumescent coating – Consumers

### 13.1. Title section

| ES 13 Service life - consumers - Intumescent coating – Consumers | |
|---|---|
| ES Ref.: ES 13<br>ES Type: Consumer | |

| Environment | | Use descriptors |
|---|---|---|
| CS 1 | Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) | ERC10a, ERC11a |

| Consumer | | Use descriptors |
|---|---|---|
| CS 2 | Plastic articles | AC13 |

### 13.2. Conditions of use affecting exposure

#### 13.2.1. Control of environmental exposure: Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| | |
|---|---|
| ERC10a | Widespread use of articles with low release (outdoor) |
| ERC11a | Widespread use of articles with low release (indoor) |

| Other conditions affecting environmental exposure | |
|---|---|
| Receiving surface water flow (m³/day): | ≥ 18000 m³/d |

#### 13.2.2. Control of consumer exposure: Plastic articles (AC13)

| | |
|---|---|
| AC13 | Plastic articles |

| Product (article) characteristics | |
|---|---|
| Physical form of product | Solid |
| Concentration of substance in product | ≤ 30 % |

| Other conditions affecting consumer exposure | |
|---|---|
| Inhalation exposure is considered to be not relevant. | |
| Oral exposure is considered to be not relevant. | |
| Dermal exposure is considered to be not relevant | |

### 13.3. Exposure estimation and reference to its source

#### 13.3.1. Environmental release and exposure Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor) (ERC10a, ERC11a)

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Freshwater | 0.005 mg/l | 0.51 mg/l | 0.01 | EUSES 2.2.0 |

| Protection target | Exposure estimation | PNEC | RCR | Assessment method |
|---|---|---|---|---|
| Marine water | 0.000482 mg/l | 0.051 mg/l | 0.01 | EUSES 2.2.0 |
| Secondary poisoning | | | < 0.01 | EUSES 2.2.0 |
| Freshwater sediment | 0.128 mg/kg dwt | 13.06 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Marine water sediment | 0.012 mg/kg dwt | 1.306 mg/kg dwt | 0.01 | EUSES 2.2.0 |
| Sewage treatment plant | 0 mg/l | 100 mg/l | < 0.01 | EUSES 2.2.0 |
| Soil | 0 mg/kg dwt | 2.312 mg/kg dwt | < 0.01 | EUSES 2.2.0 |

| Release estimation | Release route | Release rate | Release estimation method |
|---|---|---|---|
| Release estimation | Water | 0 kg/day | |
| Release estimation | Air | 0 kg/day | |
| Release estimation | Non-agricultural soil | 0 % | |

#### 13.3.2. Consumer exposure Plastic articles (AC13)

| Information for contributing exposure scenario | | | |
|---|---|---|---|
| Inhalation exposure is considered to be not relevant,Oral exposure is considered to be not relevant,Dermal exposure: Negligible | | | |
| **Route of exposure and type of effects** | **Exposure estimate:** | **RCR** | **Method** |
| Oral - Long-term - systemic effects | 0 mg/kg bw/day | < 0.01 | |
| Dermal - Long-term - systemic effects | 0 mg/kg bw/day | < 0.01 | |
| Inhalation - Long-term - systemic effects | 0 mg/m³ | < 0.01 | |
| Sum RCR - Long-term - systemic effects | | < 0.03 | |

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

#### 13.4.1. Environment

No data available

### 13.4.2. Health

| | |
|---|---|
| Guidance - Health | Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Contact supplier if guidance is required |