# Lactic Acid 88%

| | | | |
|---|---|---|---|
| Version 2.1 | Revision Date: | SDS Number: | Date of last issue: 14.02.2022 |
| FR / EN | 23.02.2022 | 100000000517 | Date of first issue: 29.11.2021 |

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

### 1.1 Product identifier

| | | |
|---|---|---|
| Trade name | : | Lactic Acid 88% |
| Substance name | : | lactic acid |
| Product name | : | Lactic acid aqueous solution 88% |
| Molecular formula | : | C3-H6-O3 |
| Chemical identity | : | 2-Hydroxypropanoic acid |
| CAS-No. | : | 50-21-5 |
| EC-No. | : | 200-018-0 |
| Unique Formula Identifier (UFI) | : | YJER-2R7Y-350X-GNEK |

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

| | | |
|---|---|---|
| Use of the Substance/Mixture | : | Biocidal product, For further information see eSDS. |
| Recommended restrictions on use | : | None known. |

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

| | | |
|---|---|---|
| Company | : | Jungbunzlauer S.A.<br>Z.I. Portuaire<br>BP 32<br>67390 Marckolsheim<br>France<br>www.jungbunzlauer.com |
| Telephone | : | +33 388 582-929 |
| Telefax | : | +33 388 582-941 |
| Responsible/issuing person | : | msds@jungbunzlauer.com |

### 1.4 Emergency telephone number

National Chemical Emergency Centre (NCEC)
+44 1865 407 333
ORFILA ( INRS)
0 1 45 42 59 59

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**

| | |
|---|---|
| Skin corrosion, Category 1 | H314: Causes severe skin burns and eye damage. |
| Serious eye damage, Category 1 | H318: Causes serious eye damage. |

### 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :

Signal word : Danger

Hazard statements : H314 Causes severe skin burns and eye damage.

Supplemental Hazard Statements : EUH071 Corrosive to the respiratory tract.

Precautionary statements :

**Prevention:**

P260 Do not breathe vapours.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.

**Hazardous components which must be listed on the label:**

Lactic acid

### 2.3 Other hazards

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

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

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

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

Chemical nature : Liquid

**Components**

| Chemical name | CAS-No.<br>EC-No.<br>Index-No.<br>Registration number | Classification | Concentration (% w/w) |
|---|---|---|---|
| Lactic acid | 50-21-5<br>200-018-0<br>listed in Annex I to Reg. (EU) No 528/2012 | Skin Corr. 1C; H314<br>Eye Dam. 1; H318<br>EUH071 | >= 70 - < 90 |

**Non-hazardous ingredients**

| Chemical name | CAS-No.<br>EC-No.<br>Registration number | Concentration (% w/w) |
|---|---|---|
| H2O | 7732-18-5<br>231-791-2<br>exempted according to REACH Annex IV | >= 10 - <= 30 |

For explanation of abbreviations see section 16.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

Protection of first-aiders : Wear personal protective equipment.

If inhaled : If breathed in, move person into fresh air.
No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.

If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

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

Symptoms : Severe eye irritation
Erythema
Skin disorders

Risks : Causes serious eye damage.
Corrosive to the respiratory tract.
Causes severe burns.

**4.3 Indication of any immediate medical attention and special treatment needed**

Treatment : Treat symptomatically.

## SECTION 5: Firefighting measures

**5.1 Extinguishing media**

Suitable extinguishing media : Water mist
Dry powder
Carbon dioxide (CO2)

Foam

Unsuitable extinguishing media : High volume water jet

**5.2 Special hazards arising from the substance or mixture**

Specific hazards during firefighting : Exposure to decomposition products may be a hazard to health.

Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

**5.3 Advice for firefighters**

Special protective equipment for firefighters : Use personal protective equipment.

Wear self-contained breathing apparatus for firefighting if necessary.

Further information : Standard procedure for chemical fires.
Use water spray to cool unopened containers.
In the event of fire and/or explosion do not breathe fumes.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

## SECTION 6: Accidental release measures

**6.1 Personal precautions, protective equipment and emergency procedures**

Personal precautions : Material can create slippery conditions.
Use personal protective equipment.

**6.2 Environmental precautions**

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

**6.3 Methods and material for containment and cleaning up**

Methods for cleaning up : Clean contaminated surface thoroughly.

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Keep in suitable, closed containers for disposal.

**6.4 Reference to other sections**

See sections: 7, 8, 11, 12 and 13.

## SECTION 7: Handling and storage

**7.1 Precautions for safe handling**

| | | |
|---|---|---|
| Technical measures | : | Avoid temperatures above 200°C. |
| Local/Total ventilation | : | Ensure adequate ventilation, especially in confined areas. |
| Advice on safe handling | : | Do not breathe vapours/dust.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area.<br>To avoid spills during handling keep bottle on a metal tray.<br>Dispose of rinse water in accordance with local and national regulations. |
| Advice on protection against fire and explosion | : | Normal measures for preventive fire protection. |
| Hygiene measures | : | Handle in accordance with good industrial hygiene and safety practice. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use.<br><br>When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday. |

**7.2 Conditions for safe storage, including any incompatibilities**

| | | |
|---|---|---|
| Requirements for storage areas and containers | : | Keep in an area equipped with acid resistant flooring. Store in original container.<br><br>Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards. |
| Further information on storage conditions | : | Keep away from direct sunlight. |
| Advice on common storage | : | Incompatible with bases. |
| Recommended storage temperature | : | > 5 °C |
| Further information on storage stability | : | No decomposition if stored and applied as directed. |

Packaging material : Suitable material: Plastic container of HDPE, Stainless steel 316L

**7.3 Specific end use(s)**

Specific use(s) : none

## SECTION 8: Exposure controls/personal protection

**8.1 Control parameters**

Contains no substances with occupational exposure limit values.

**Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:**

| Substance name | Environmental Compartment | Value |
|---|---|---|
| Lactic acid | Water | 1,3 mg/l |

**8.2 Exposure controls**

**Engineering measures**

Ensure adequate ventilation, especially in confined areas.

**Personal protective equipment**

Eye protection : Ensure that eyewash stations and safety showers are close to the workstation location.
Safety glasses with side-shields

Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection
Remarks : Wear suitable gloves tested to EN374.

The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Skin and body protection : acid-resistant protective clothing
Long sleeved clothing
Footwear protecting against chemicals

Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
Half mask with a particle filter P2 (EN 143)

No personal respiratory protective equipment normally required.

| | | |
|---|---|---|
| Protective measures | : | Avoid contact with skin and clothing.<br>Wash skin thoroughly after handling. |

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Aqueous solution, viscous |
| Colour | : | colourless, light yellow |
| Odour | : | characteristic |
| Odour Threshold | : | Not relevant |
| Melting point/freezing point | : | < -80 °C (ca. 1.013,25 hPa) |
| Boiling point/boiling range | : | 110 - 130 °C |
| Flammability | : | Not applicable |
| Upper explosion limit / Upper flammability limit | : | Not applicable |
| Lower explosion limit / Lower flammability limit | : | Not applicable |
| Flash point | : | Not applicable, (as aqueous solution) |
| Auto-ignition temperature | : | 400 °C |
| Decomposition temperature | : | No data available |
| pH | : | < 2 (25 °C) |
| Viscosity | | |
| Viscosity, dynamic | : | 18,4 mPa.s (25 °C) |
| Viscosity, kinematic | : | No data available |
| Solubility(ies) | | |
| Water solubility | : | completely miscible |
| Partition coefficient: n-octanol/water | : | log Pow: -0,54 (20 °C) |
| Vapour pressure | : | ca. 0,038 hPa (20 °C) |
| Density | : | 1,0 - 1,3 g/cm3 |
| Relative vapour density | : | No data available |

**9.2 Other information**

| | | |
|---|---|---|
| Explosives | : | Not applicable |
| Oxidizing properties | : | Not applicable |
| Flammability (liquids) | : | Not applicable |
| Metal corrosion rate | : | Not classified due to data which are conclusive although insufficient for classification. |
| Evaporation rate | : | Not applicable |
| Surface tension | : | 70,7 mN/m, 1 g/l, 20 °C |

## SECTION 10: Stability and reactivity

**10.1 Reactivity**

No decomposition if stored and applied as directed.

**10.2 Chemical stability**

No decomposition if stored and applied as directed.

**10.3 Possibility of hazardous reactions**

| | | |
|---|---|---|
| Hazardous reactions | : | No decomposition if stored and applied as directed. |

**10.4 Conditions to avoid**

| | | |
|---|---|---|
| Conditions to avoid | : | Temperature > 200 °C |

**10.5 Incompatible materials**

| | | |
|---|---|---|
| Materials to avoid | : | Bases<br>Oxidizing agents |

**10.6 Hazardous decomposition products**

Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.
Carbon dioxide (CO2)
Carbon monoxide

## SECTION 11: Toxicological information

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

**Acute toxicity**

Not classified based on available information.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 Oral (Rat, female): 3.543 mg/kg |

Test substance: Lactic acid
Assessment: The substance or mixture has no acute oral toxicity

LD50 Oral (Rat, male): 4.936 mg/kg
Test substance: Lactic acid
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat, male and female): 7,94 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Test substance: Lactic acid
Assessment: The substance or mixture has no acute inhalation toxicity, Corrosive to the respiratory tract.

Acute dermal toxicity : LD50 Dermal (Rabbit): 2.000 mg/kg
Test substance: Lactic acid
Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Causes severe burns.

**Product:**

Remarks : Extremely corrosive and destructive to tissue.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Exposure time | : | 4 h |
| Assessment | : | Corrosive after 1 to 4 hours of exposure |
| Result | : | Skin irritation |
| Test substance | : | Lactic acid |

**Serious eye damage/eye irritation**

Causes serious eye damage.

**Product:**

Remarks : May cause irreversible eye damage.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Species | : | chicken |
| Result | : | Severe irritation |
| Test substance | : | Lactic acid |

**Respiratory or skin sensitisation**

**Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Species | : | Guinea pig |
| Result | : | Does not cause skin sensitisation. |

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Germ cell mutagenicity-Assessment | : | In vitro tests did not show mutagenic effects |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat, male and female |
| Result | : | Animal testing did not show any carcinogenic effects. |
| Test substance | : | Calcium lactate |

**Reproductive toxicity**

Not classified based on available information.

**Components:**

**Lactic acid:**

**STOT - single exposure**

Corrosive to the respiratory tract.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Assessment | : | No data available |

**STOT - repeated exposure**

Not classified based on available information.

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Assessment | : | The substance or mixture is not classified as specific target organ toxicant, repeated exposure. |

**Repeated dose toxicity**

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Species | : | Rat |
| LOAEL | : | 886 mg/kg |
| Application Route | : | Dermal |
| Exposure time | : | 13 wk |
| Number of exposures | : | 5 d/wk |
| Dose | : | 886 mg/kg bw |
| Test substance | : | Lactic acid |
| Assessment | : | slight irritation |

| | | |
|---|---|---|
| Species | : | Rat, female |
| NOAEL | : | 50.000 mg/l |
| Application Route | : | Oral |
| Exposure time | : | 13 wk |
| Number of exposures | : | 1/d |
| Dose | : | 5% |
| Test substance | : | Calcium lactate |
| Assessment | : | No adverse effects |

**Aspiration toxicity**

Not classified based on available information.

**Components:**

**Lactic acid:**

No data available

**11.2 Information on other hazards**

**Endocrine disrupting properties**

**Product:**

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

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Assessment | : | The substance/mixture does not contain components |

considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**Further information**

**Product:**

Remarks : No data available

## SECTION 12: Ecological information

### 12.1 Toxicity

**Components:**

**Lactic acid:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 130 mg/l
Exposure time: 96 h
Test substance: Lactic acid
Not classified

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 130 mg/l
End point: Immobilization
Exposure time: 48 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): > 2.800 mg/l
Exposure time: 72 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

NOEC (Pseudokirchneriella subcapitata (green algae)): 1.900 mg/l
Exposure time: 70 h
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Test substance: Lactic acid
Not classified due to data which are conclusive although insufficient for classification.

Toxicity to fish (Chronic : LOEC: ca. 2,18 mg/l

| | | |
|---|---|---|
| toxicity) | | Exposure time: 90 d<br>Species: Fish (Oreochromus mossambica)<br>Test substance: Lactic acid<br>Environmental exposure assessment for this scenario is not relevant. |
| Toxicity to terrestrial organisms | : | LC50: > 2.250 mg/kg<br>Exposure time: 14 d<br>Species: Colinus virginianus (Bobwhite quail)<br>Test substance: L(+)-Lactic acid |

**12.2 Persistence and degradability**

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Biodegradability | : | Test Type: Closed Bottle test<br>Inoculum: activated sludge<br>Biodegradation: 80 %<br>Related to: Biochemical oxygen demand<br>Exposure time: 28 d<br>Method: OECD Test Guideline 301<br>Test substance: L(+)-Lactic acid<br>Readily biodegradable.<br><br>Test Type: Ready biodegradability<br>Method: QSAR<br>Test substance: L(+)-Lactic acid<br>Readily biodegradable. |
| Stability in water | : | Not applicable |

**12.3 Bioaccumulative potential**

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Bioaccumulation | : | The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected. |
| Partition coefficient: n-octanol/water | : | log Pow: -0,54 (20 °C) |

**12.4 Mobility in soil**

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Mobility | : | Method: Calculation, Mackay Level III Fugacity Model<br>After release, disperses through ground water. |
| Distribution among | : | Koc: < 20,9, log Koc: < 1,32 |

| | | |
|---|---|---|
| environmental compartments | | Method: OECD Test Guideline 121<br>Lactic acid |
| Stability in soil | : | Readily biodegradable. |

### 12.5 Results of PBT and vPvB assessment

**Product:**

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

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Assessment | : | This substance is not considered to be persistent, bioaccumulating and toxic (PBT). |

### 12.6 Endocrine disrupting properties

**Product:**

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

**Components:**

**Lactic acid:**

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

**Non-hazardous ingredients:**

### 12.7 Other adverse effects

**Product:**

| | | |
|---|---|---|
| Additional ecological information | : | No data available |

**Components:**

**Lactic acid:**

| | | |
|---|---|---|
| Additional ecological information | : | No data available |

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

| | | |
|---|---|---|
| Product | : | In accordance with local and national regulations.<br><br>Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container.<br>Send to a licensed waste management company. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14: Transport information

### 14.1 UN number or ID number

| | | |
|---|---|---|
| **ADR** | : | UN 3265 |
| **RID** | : | UN 3265 |
| **IMDG** | : | UN 3265 |
| **IATA** | : | UN 3265 |

### 14.2 UN proper shipping name

| | | |
|---|---|---|
| **ADR** | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| **RID** | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| **IMDG** | : | CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (lactic acid) |
| **IATA** | : | Corrosive liquid, acidic, organic, n.o.s. (lactic acid) |

### 14.3 Transport hazard class(es)

| | | |
|---|---|---|
| **ADR** | : | 8 |
| **RID** | : | 8 |
| **IMDG** | : | 8 |
| **IATA** | : | 8 |

### 14.4 Packing group

**ADR**

| | | |
|---|---|---|
| Packing group | : | III |
| Classification Code | : | C3 |
| Hazard Identification Number | : | 80 |

| | | |
|---|---|---|
| Labels | : | 8 |
| Tunnel restriction code | : | (E) |

**RID**

| | | |
|---|---|---|
| Packing group | : | III |
| Classification Code | : | C3 |
| Hazard Identification Number | : | 80 |
| Labels | : | 8 |

**IMDG**

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

**IATA (Cargo)**

| | | |
|---|---|---|
| Packing instruction (cargo aircraft) | : | 856 |
| Packing instruction (LQ) | : | Y841 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |

**IATA (Passenger)**

| | | |
|---|---|---|
| Packing instruction (passenger aircraft) | : | 852 |
| Packing instruction (LQ) | : | Y841 |
| Packing group | : | III |
| Labels | : | Class 8 - Corrosive substances |

### 14.5 Environmental hazards

**ADR**

| | | |
|---|---|---|
| Environmentally hazardous | : | no |

**RID**

| | | |
|---|---|---|
| Environmentally hazardous | : | no |

**IMDG**

| | | |
|---|---|---|
| Marine pollutant | : | no |

### 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

### 14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

| | | |
|---|---|---|
| REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) | : | Conditions of restriction for the following entries should be considered:<br>Number on list 3 |

| | | |
|---|---|---|
| REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). | : | Not applicable |
| Regulation (EC) No 1005/2009 on substances that deplete the ozone layer | : | Not applicable |
| Regulation (EU) 2019/1021 on persistent organic pollutants (recast) | : | Not applicable |
| Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals | : | Not applicable |
| REACH - List of substances subject to authorisation (Annex XIV) | : | Not applicable |

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. Not applicable

| | | |
|---|---|---|
| Occupational Illnesses (R-461-3, France) | : | Not applicable |
| Reinforced medical supervision (R4624-18) | : | The product has no CMR properties |
| Volatile organic compounds | : | Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Not applicable |

**Other regulations:**

Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
is applicable if lactic acid is used for the production of biocides

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |
| AIIC | : | On the inventory, or in compliance with the inventory |
| DSL | : | All components of this product are on the Canadian DSL |
| ENCS | : | On the inventory, or in compliance with the inventory |

| | | |
|---|---|---|
| ISHL | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| NZIoC | : | Not in compliance with the inventory |

**15.2 Chemical safety assessment**

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

## SECTION 16: Other information

**Full text of H-Statements**

| | | |
|---|---|---|
| H314 | : | Causes severe skin burns and eye damage. |
| H318 | : | Causes serious eye damage. |
| EUH071 | : | Corrosive to the respiratory tract. |

**Full text of other abbreviations**

| | | |
|---|---|---|
| Eye Dam. | : | Serious eye damage |
| Skin Corr. | : | Skin corrosion |

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID -

Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

**Further information**

| **Classification of the mixture:** | | **Classification procedure:** |
|---|---|---|
| Skin Corr. 1 | H314 | Based on product data or assessment |
| Eye Dam. 1 | H318 | Based on product data or assessment |

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

# Annex

### Exposure Scenario

| Number | Title |
|---|---|
| **ES1** | Manufacture. |
| **ES2** | Formulation or re-packing |
| **ES3** | Formulation or re-packing |
| **ES4** | Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9). |
| **ES5** | Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9). |
| **ES6** | Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23). |
| **ES7** | Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18). |
| **ES8** | Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12). |
| **ES9** | Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9). |
| **ES10** | Use at industrial sites; Other (PC0). |
| **ES11** | Use at industrial sites; Other (PC0); Building and construction work (SU19). |
| **ES12** | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20). |
| **ES13** | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0). |
| **ES14** | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9). |
| **ES15** | Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18). |
| **ES16** | Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35). |
| **ES17** | Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35). |
| **ES18** | Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13). |

| | |
|---|---|
| **ES19** | Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13). |
| **ES20** | Service life - workers; Various articles (AC4a, AC4g). |
| **ES21** | Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13). |

## ES1: Manufacture.

### 1.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Manufacture |
| **Structured Short Title** | : | Manufacture. |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Manufacture of the substance** | ERC1 |
| **Worker** | | |
| **CS2** | **various processes** | PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15, PROC28 |

### 1.2. Conditions of use affecting exposure

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

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**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) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |
| **Amount used, frequency and duration of use (or from service life)** | | |
| Duration | : | Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | | |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. | | |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. | | |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment | | |
| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
| Wear suitable gloves tested to EN374.<br>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. | | |
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

#### 1.3.1. Environmental release and exposure: Manufacture of the substance (ERC1)

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

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

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

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

Not relevant

## ES2: Formulation or re-packing

### 2.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Formulation into mixture |
| **Structured Short Title** | : | Formulation or re-packing |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Formulation into mixture** | ERC2 |
| **Worker** | | |
| **CS2** | **various processes** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19, PROC26, PROC28 |

### 2.2. Conditions of use affecting exposure

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

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production

**where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |

| | | |
|---|---|---|
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

## 2.3. Exposure estimation and reference to its source

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

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

### 2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES3: Formulation or re-packing

### 3.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Formulation into solid matrix |
| **Structured Short Title** | : | Formulation or re-packing |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Formulation into solid matrix** | ERC3 |
| **Worker** | | |
| **CS2** | **various processes** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14, PROC15, PROC19, PROC26, PROC28 |

### 3.2. Conditions of use affecting exposure

#### 3.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 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) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production

**where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |

| |
|---|
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

#### 3.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

#### 3.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES4: Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9).**

### 4.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of non-reactive processing aid at industrial site (no inclusion into or onto article) |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC1, PC2, PC9a, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC36, PC37); Various sectors (SU1, SU2a, SU2b, SU4, SU8, SU9). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of non-reactive processing aid at industrial site (no inclusion into or onto article)** | ERC4 |
| **Worker** | | |
| **CS2** | **various processes** | PROC2, PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28 |

### 4.2. Conditions of use affecting exposure

**4.2.1. Control of environmental exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**

| **Product (article) characteristics** | |
|---|---|
| Covers percentage substance in the product up to 100 %. | |
| Physical form of product | : Liquid |

**4.2.2. Control of worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** | |
|---|---|
| Covers percentage substance in the product up to 100 %. | |
| Physical form of product | : Liquid |
| **Amount used, frequency and duration of use (or from service life)** | |
| Duration | : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | |
| Ensure adequate ventilation, especially in confined areas. | |

| |
|---|
| Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |

| | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

**4.3.1. Environmental release and exposure: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) (ERC4)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**4.3.2. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) /**

**Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES5: Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9).**

### 5.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of reactive processing aid at industrial site (no inclusion into or onto article) |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU8, SU9). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of reactive processing aid at industrial site (no inclusion into or onto article)** | ERC6b |
| **Worker** | | |
| **CS2** | **various processes** | PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28 |

### 5.2. Conditions of use affecting exposure

**5.2.1. Control of environmental exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)**

| **Product (article) characteristics** | |
|---|---|
| Covers percentage substance in the product up to 100 %. | |
| Physical form of product | : Liquid |

**5.2.2. 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) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** | |
|---|---|
| Covers percentage substance in the product up to 100 %. | |
| Physical form of product | : Liquid |
| **Amount used, frequency and duration of use (or from service life)** | |
| Duration | : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. | |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. | |

| |
|---|
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |

| | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | 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 reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**5.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles**

**(PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

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

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES6: Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23).

### 6.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of functional fluid at industrial site |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC4, PC21, PC24); Various sectors (SU2a, SU2b, SU17, SU19, SU23). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of functional fluid at industrial site** | ERC7 |
| **Worker** | | |
| **CS2** | **various processes** | PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28 |

### 6.2. Conditions of use affecting exposure

#### 6.2.1. Control of environmental exposure: Use of functional fluid at industrial site (ERC7)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**6.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |

| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
|---|---|---|
| Wear suitable gloves tested to EN374.<br>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. | | |
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

#### 6.3.1. Environmental release and exposure: Use of functional fluid at industrial site (ERC7)

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**6.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative | |

| | | | | |
|---|---|---|---|---|
| | | | approach used to conclude safe use. | |

### 6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES7: Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).

### 7.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use at industrial site leading to inclusion into/onto article |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC1, PC9a, PC18, PC20, PC23, PC26, PC32, PC34); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use at industrial site leading to inclusion into/onto article** | ERC5 |
| **Worker** | | |
| **CS2** | **various processes** | PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13, PROC28 |

### 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)

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 7.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

| | | |
|---|---|---|
| Physical form of product | : | Liquid |
| **Amount used, frequency and duration of use (or from service life)** | | |
| Duration | : | Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | | |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. | | |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. | | |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment | | |
| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
| Wear suitable gloves tested to EN374.<br>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. | | |
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °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)

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

#### 7.3.2. Worker exposure: Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 7.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES8: Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12).

### 8.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC9a, PC15, PC20, PC21, PC35, PC37); Various sectors (SU8, SU9, SU12). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)** | ERC6d |
| **Worker** | | |
| **CS2** | **various processes** | PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15, PROC21, PROC26, PROC28 |

### 8.2. Conditions of use affecting exposure

#### 8.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 8.2.2. 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) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) /

**Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |

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

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

**8.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)**

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**8.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 8.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.

If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES9: Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9).

### 9.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use as intermediate |
| **Structured Short Title** | : | Use at industrial sites; Various products (PC2, PC9a, PC15, PC20, PC21, PC35, PC36, PC37); Various sectors (SU4, SU8, SU9). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of intermediate** | ERC6a |
| **Worker** | | |
| **CS2** | **various processes** | PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC15, PROC21, PROC26, PROC28 |

### 9.2. Conditions of use affecting exposure

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

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**9.2.2. 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) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including**

**weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |

| | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

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

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**9.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 9.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES10: Use at industrial sites; Other (PC0).

### 10.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) |
| **Structured Short Title** | : | Use at industrial sites; Other (PC0). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)** | ERC6c |
| **Worker** | | |
| **CS2** | **various processes** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC28 |

### 10.2. Conditions of use affecting exposure

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

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**10.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|

| | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |
| **Amount used, frequency and duration of use (or from service life)** | | |
| Duration | : | Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | | |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. | | |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. | | |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment | | |
| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
| Wear suitable gloves tested to EN374.<br>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. | | |
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

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

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**10.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 10.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES11: Use at industrial sites; Other (PC0); Building and construction work (SU19).

### 11.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Other: building and construction preparations |
| **Structured Short Title** | : | Use at industrial sites; Other (PC0); Building and construction work (SU19). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use at industrial site leading to inclusion into/onto article** | ERC5 |
| **Worker** | | |
| **CS2** | **various processes** | PROC5, PROC8a, PROC8b, PROC9, PROC28 |

### 11.2. Conditions of use affecting exposure

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

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 11.2.2. Control of worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

| **Amount used, frequency and duration of use (or from service life)** | | |
|---|---|---|
| Duration | : | Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | | |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. | | |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. | | |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. | | |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment | | |
| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
| Wear suitable gloves tested to EN374.<br>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. | | |
| Use suitable eye protection. | | |
| Handle in accordance with good industrial hygiene and safety practice. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

**11.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)**

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**11.3.2. Worker exposure: Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 11.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES12: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20).**

### 12.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor), Outdoor |
| **Structured Short Title** | : | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Various sectors (SU1, SU20). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)** | ERC8d, ERC8a |
| **Worker** | | |
| **CS2** | **various processes** | PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28 |

### 12.2. Conditions of use affecting exposure

**12.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |

**12.2.2. 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) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |

| |
|---|
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

**12.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**12.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) /**

**Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 12.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES13: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0).**

### 13.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Widespread use of reactive processing aid (no inclusion into or onto article, indoor), Outdoor |
| **Structured Short Title** | : | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC38); Other (SU0). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of reactive processing aid (no inclusion into or onto article, indoor)** | ERC8e, ERC8b |
| **Worker** | | |
| **CS2** | **various processes** | PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC24, PROC26, PROC28 |

### 13.2. Conditions of use affecting exposure

**13.2.1. Control of environmental exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e) / Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |

**13.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems |

| |
|---|
| Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

**13.3.1. Environmental release and exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e) / Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8b)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**13.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 13.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES14: Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9).**

### 14.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use in functional fluids |
| **Structured Short Title** | : | Widespread use by professional workers; Various products (PC1, PC3, PC4, PC8, PC9a, PC9b, PC9c, PC12, PC14, PC15, PC20, PC21, PC24, PC25, PC31, PC35, PC37, PC38); Various sectors (SU0, SU1, SU8, SU9). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of functional fluid (outdoor), Widespread use of functional fluid (indoor)** | ERC9b, ERC9a |
| **Worker** | | |
| **CS2** | **various processes** | PROC3, PROC4, PROC5, PROC6, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC16, PROC17, PROC18, PROC19, PROC20, PROC21, PROC24, PROC26, PROC28 |

### 14.2. Conditions of use affecting exposure

**14.2.1. Control of environmental exposure: Widespread use of functional fluid (outdoor) (ERC9b) / Widespread use of functional fluid (indoor) (ERC9a)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |

**14.2.2. 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) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |

| |
|---|
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

## 14.3. Exposure estimation and reference to its source

### 14.3.1. Environmental release and exposure: Widespread use of functional fluid (outdoor) (ERC9b) / Widespread use of functional fluid (indoor) (ERC9a)

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

### 14.3.2. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Calendering operations (PROC6) / Industrial spraying (PROC7) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / Use of fuels (PROC16) / Lubrication at high energy conditions in metal working operations (PROC17) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Use of functional fluids in small devices (PROC20) / Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials

**and/or articles (PROC24) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 14.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

**ES15: Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18).**

### 15.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Widespread use leading to inclusion into/onto article (outdoor) |
| **Structured Short Title** | : | Widespread use by professional workers; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31); Various sectors (SU4, SU5, SU6a, SU6b, SU7, SU11, SU12, SU13, SU18). |

| **Environment** | | |
|---|---|---|
| **CS1** | **Widespread use leading to inclusion into/onto article (outdoor)** | ERC8f |
| **Worker** | | |
| **CS2** | **various processes** | PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC11, PROC13, PROC14, PROC15, PROC18, PROC19, PROC26, PROC28 |

### 15.2. Conditions of use affecting exposure

#### 15.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**15.2.2. Control of worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |
| Physical form of product : Liquid |
| **Amount used, frequency and duration of use (or from service life)** |
| Duration : Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| For further specification, refer to section 8 of the SDS. |

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

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

**15.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)**

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**15.3.2. Worker exposure: Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Non-industrial spraying (PROC11) / Treatment of articles by dipping and pouring (PROC13) / Tabletting, compression, extrusion, pelettisation, granulation (PROC14) / Use as laboratory reagent (PROC15) / General greasing/lubrication at high kinetic energy conditions (PROC18) / Manual activities involving hand contact (PROC19) / Handling of solid inorganic substances at ambient temperature (PROC26) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 15.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure

scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES16: Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

### 16.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Consumer use, (with service life) |
| **Structured Short Title** | : | Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use leading to inclusion into/onto article (outdoor)** | ERC8f |
| **Consumer** | | |
| **CS2** | **Various products** | PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35 |

### 16.2. Conditions of use affecting exposure

**16.2.1. Control of environmental exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

**16.2.2. Control of consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

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

**16.3.1. Environmental release and exposure: Widespread use leading to inclusion into/onto article (outdoor) (ERC8f)**

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**16.3.2. Consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 16.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable

## ES17: Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35).

### 17.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Consumer use, (without service life) |
| **Structured Short Title** | : | Consumer use; Various products (PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor), Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)** | ERC8d, ERC8a |
| **Consumer** | | |
| **CS2** | **Various products** | PC1, PC4, PC8, PC9b, PC9c, PC15, PC20, PC24, PC31, PC35 |

### 17.2. Conditions of use affecting exposure

**17.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

**17.2.2. Control of consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

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

**17.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) (ERC8d) / Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)**

| Additional information on exposure estimation |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**17.3.2. Consumer exposure: Adhesives, sealants (PC1) / Anti-Freeze and de-icing products (PC4) / Biocidal products (e.g. Disinfectants, pest control) (PC8) / Fillers, putties, plasters, modelling clay (PC9b) / Finger paints (PC9c) / Non-metal-surface treatment products (PC15) / Products such as pH-regulators, flocculants, precipitants, neutralization agents (PC20) / Lubricants, greases, release products (PC24) / Polishes and wax blends (PC31) / Washing and cleaning products (including solvent based products) (PC35)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 17.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable

## ES18: Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

### 18.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Processing of articles at industrial sites with low release, Processing of articles at industrial sites with high release |
| **Structured Short Title** | : | Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Processing of articles at industrial sites with high release, Processing of articles at industrial sites with low release** | ERC12b, ERC12a |
| **Worker** | | |
| **CS2** | **various processes** | PROC21, PROC24, PROC28 |

### 18.2. Conditions of use affecting exposure

#### 18.2.1. Control of environmental exposure: Processing of articles at industrial sites with high release (ERC12b) / Processing of articles at industrial sites with low release (ERC12a)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 18.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |
| **Amount used, frequency and duration of use (or from service life)** | | |

| | | |
|---|---|---|
| Duration | : | Exposure duration <= 8 h |

| **Technical and organisational conditions and measures** |
|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

#### 18.3.1. Environmental release and exposure: Processing of articles at industrial sites with high release (ERC12b) / Processing of articles at industrial sites with low release (ERC12a)

| **Additional information on exposure estimation** |
|---|

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

**18.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 18.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES19: Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13).

### 19.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Use of articles at industrial sites with low release |
| **Structured Short Title** | : | Service life - workers; Various articles (AC0, AC1, AC7, AC10, AC11, AC13). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Use of articles at industrial sites with low release** | ERC12c |
| **Worker** | | |
| **CS2** | **various processes** | PROC21, PROC28 |

### 19.2. Conditions of use affecting exposure

#### 19.2.1. Control of environmental exposure: Use of articles at industrial sites with low release (ERC12c)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

#### 19.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Manual maintenance (cleaning and repair) of machinery (PROC28)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |
| **Amount used, frequency and duration of use (or from service life)** | | |
| Duration | : | Exposure duration <= 8 h |
| **Technical and organisational conditions and measures** | | |

| |
|---|
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.<br>Ensure regular inspection, cleaning and maintenance of equipment and machines.<br>Clear spills immediately.<br>Ensure daily cleaning of the equipment. |
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| Handle in accordance with good industrial hygiene and safety practice. |
| For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |
| Indoor or outdoor use : Indoor use |
| Temperature : Assumes process temperature up to 40 °C |

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

#### 19.3.1. Environmental release and exposure: Use of articles at industrial sites with low release (ERC12c)

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**19.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / Manual maintenance (cleaning and repair) of machinery (PROC28)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 19.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

## ES20: Service life - workers; Various articles (AC4a, AC4g).

### 20.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Widespread use of articles with high or intended release (indoor), Outdoor, Widespread use of articles with low release (indoor) |
| **Structured Short Title** | : | Service life - workers; Various articles (AC4a, AC4g). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of articles with high or intended release (outdoor), Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor), Widespread use of articles with high or intended release (indoor)** | ERC10b, ERC10a, ERC11a, ERC11b |
| **Worker** | | |
| **CS2** | **various processes** | PROC21, PROC24 |

### 20.2. Conditions of use affecting exposure

**20.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

**20.2.2. Control of worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers percentage substance in the product up to 100 %. | | |
| Physical form of product | : | Liquid |

| **Amount used, frequency and duration of use (or from service life)** | | |
|---|---|---|
| Duration | : | Exposure duration <= 8 h |

| **Technical and organisational conditions and measures** |
|---|
| Ensure adequate ventilation, especially in confined areas.<br>Avoid temperatures above 200°C.<br>Ensure that eyewash stations and safety showers are close to the workstation location. |
| Closed systems<br>Training of staff on good practice<br>Assumes a good basic standard of occupational hygiene is implemented<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed. |
| Open systems<br>Minimisation of staff exposed<br>Segregation of the emitting process<br>Effective contaminant extraction<br>Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).<br>Minimisation of manual phases<br>Avoid contact with contaminated tools and objects.<br>Regular cleaning of work area<br>Regular cleaning of equipment |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Wear suitable gloves tested to EN374.<br>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. |
| Use suitable eye protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Temperature | : | Assumes process temperature up to 40 °C |

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

**20.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**20.3.2. Worker exposure: Low energy manipulation and handling of substances bound in/on materials and/or articles (PROC21) / High (mechanical) energy work-up of substances bound in/on materials and/or articles (PROC24)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 20.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The immediate downstream user is required to evaluate
whether the operational conditions and risk management measures described in the exposure scenario fit to his use.
If other OC/RMM are adopted, the user should ensure that risks are managed to at least equivalent levels.

### ES21: Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13).

### 21.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Widespread use of articles with high or intended release (outdoor), Indoor |
| **Structured Short Title** | : | Service life - consumers; Various articles (AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13). |

| | | |
|---|---|---|
| **Environment** | | |
| **CS1** | **Widespread use of articles with high or intended release (outdoor), Widespread use of articles with low release (outdoor), Widespread use of articles with low release (indoor), Widespread use of articles with high or intended release (indoor)** | ERC10b, ERC10a, ERC11a, ERC11b |
| **Consumer** | | |
| **CS2** | **Various articles** | AC1, AC2, AC4a, AC4g, AC7, AC10, AC11, AC13 |

### 21.2. Conditions of use affecting exposure

**21.2.1. Control of environmental exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)**

| **Product (article) characteristics** |
|---|
| Covers percentage substance in the product up to 100 %. |

**21.2.2. Control of consumer exposure: Vehicles (AC1) / Machinery, mechanical appliances, electrical/electronic articles (AC2) / Stone, plaster, cement, glass and ceramic articles: Large surface area articles (AC4a) / Other articles made of stone, plaster, cement, glass or ceramic (AC4g) / Metal articles (AC7) / Rubber articles (AC10) / Wood articles (AC11) / Plastic articles (AC13)**

| **Product (article) characteristics** |
|---|

| |
|---|
| Covers percentage substance in the product up to 100 %. |

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

**21.3.1. Environmental release and exposure: Widespread use of articles with high or intended release (outdoor) (ERC10b) / Widespread use of articles with low release (outdoor) (ERC10a) / Widespread use of articles with low release (indoor) (ERC11a) / Widespread use of articles with high or intended release (indoor) (ERC11b)**

| **Additional information on exposure estimation** |
|---|
| As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed. |

**21.3.2. Consumer exposure: Vehicles (AC1) / Machinery, mechanical appliances, electrical/electronic articles (AC2) / Stone, plaster, cement, glass and ceramic articles: Large surface area articles (AC4a) / Other articles made of stone, plaster, cement, glass or ceramic (AC4g) / Metal articles (AC7) / Rubber articles (AC10) / Wood articles (AC11) / Plastic articles (AC13)**

| Exposure route | Health effect | Exposure indicator | Exposure level | RCR |
|---|---|---|---|---|
| Eye | | | Qualitative approach used to conclude safe use. | |
| dermal | | | Qualitative approach used to conclude safe use. | |
| inhalative | | | Qualitative approach used to conclude safe use. | |

### 21.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Not applicable