Revision Date 02.07.2014

# SODA SOLVAY ® DENSE

## SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

- Product name : **SODA SOLVAY ® DENSE**
- Chemical Name : Sodium carbonate
- Synonyms : Dense Sodium Carbonate/Soda Ash
- Molecular formula : Na2CO3
- REACH Registration Number : 01-2119485498-19
- Type of product : Substance
- CAS-No. : 497-19-8

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

- Identified uses :
  - Glass industry
  - Detergent
  - Chemical industry
  - Metallurgy
  - Purifying flue gas

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

- Company : SOLVAY SA - CORPORATE HEADQUARTERS (SCH)
- Address : RUE DE RANSBEEK, 310 B- 1120 BRUXELLES
- Telephone : +3222642111
- Fax : +3222643061
- E-mail address : manager.sds@solvay.com

### 1.4. Emergency telephone number

**- Emergency telephone number** **+44(0)1235 239 670 [CareChem 24] (Europe)**

## SECTION 2. HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

2.1.1. European regulation (EC) 1272/2008, as amended

*Classified as hazardous according to the European regulation (EC) 1272/2008, as amended*

| Hazard class | Hazard category | Route of exposure | H Phrases |
|---|---|---|---|
| Eye irritation | Category 2 | | H319 |

2.1.2. European Directive 67/548/EEC or 1999/45/EC, as amended

*Classified as hazardous according to European Directive 67/548/EEC or 1999/45/EC, as amended*

| Hazard class / Hazard category | R-phrase(s) |
|---|---|
| Xi | R36 |

**2.2. Label elements**

2.2.1. Signal word

Warning

2.2.2. Hazard pictograms

2.2.3. Hazard statements

H319 - Causes serious eye irritation.

2.2.4. Precautionary statements

| | | | |
|---|---|---|---|
| **Prevention** | P264 | - | Wash hands thoroughly after handling. |
| | P280 | - | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| **Response** | P305 + P351 + P338 | - | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| | P337 + P313 | - | If eye irritation persists: Get medical advice/ attention. |

**2.3. Other hazards**

- None known.

## SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1. Substances**

**3.1.1. Concentration**

| Substance name: | Concentration |
|---|---|
| **Sodium carbonate**<br><br>CAS-No.: 497-19-8 / EC-No.: 207-838-8 / Index-No.: 011-005-00-2<br>REACH Registration Number: 01-2119485498-19 | >= 99 % |

## SECTION 4. FIRST AID MEASURES

**4.1. Description of first aid measures**

4.1.1. If inhaled

- Move to fresh air.
- If symptoms persist, call a physician.

4.1.2. In case of eye contact

- In case of eye contact, remove contact lens and rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If eye irritation persists, consult a specialist.

4.1.3. In case of skin contact

- Wash off with soap and water.
- If symptoms persist, call a physician.

4.1.4. If swallowed

- Rinse mouth with water.
- Do NOT induce vomiting.

- If symptoms persist, call a physician or Poison Control Centre immediately.

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

4.2.1. Inhalation

- May cause nose, throat, and lung irritation.
- In case of higher concentrations: Cough
- Repeated or prolonged exposure: Risk of sore throat, nose bleeds

4.2.2. Skin contact

- Prolonged skin contact may cause skin irritation.

4.2.3. Eye contact

- Severe eye irritation
- Symptoms: Redness, Lachrymation, Swelling of tissue

4.2.4. Ingestion

- Severe irritation
- Symptoms: Nausea, Abdominal pain, Vomiting, Diarrhoea

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

- None.

## SECTION 5. FIREFIGHTING MEASURES

**5.1. Extinguishing media**

5.1.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.1.2. Unsuitable extinguishing media

- None.

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

- Not combustible.

**5.3. Advice for firefighters**

- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

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

6.1.1. Advice for non-emergency personnel

- Avoid dust formation.

6.1.2. Advice for emergency responders

- Sweep up to prevent slipping hazard.

**6.2. Environmental precautions**

- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.
- Prevent any mixture with an acid into the sewer/drain (gas formations).
- Local authorities should be advised if significant spillages cannot be contained.

**6.3. Methods and materials for containment and cleaning up**

- Sweep up and shovel into suitable containers for disposal.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.

**6.4. Reference to other sections**

- Refer to protective measures listed in sections 7 and 8.

## SECTION 7. HANDLING AND STORAGE

### 7.1. Precautions for safe handling

- Ensure adequate ventilation.
- Minimize dust generation and accumulation.
- Avoid contact with skin and eyes.
- Keep away from Incompatible products.

### 7.2. Conditions for storage, including incompatibilities

7.2.1. Storage

- Store in original container.
- Keep in a dry place.
- Keep in properly labelled containers.
- Keep container closed.
- Keep away from Incompatible products.

7.2.2. Packaging material

*7.2.2.1. Suitable material*

- Polyethylene
- Woven plastic material + PE.

*7.2.2.2. Unsuitable material*

- Material moisture permeable

### 7.3. Specific end use(s)

- For further information, please contact: Supplier
- This grade of the product is not intended for pharmaceutical, feed or food applications.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters

8.1.1. Exposure Limit Values

**Sodium carbonate**

- SAEL (Solvay Acceptable Exposure Limit) 2007
  TWA = 10 mg/m3
- US. ACGIH Threshold Limit Values
  Remarks: none established

8.1.2. Other information on limit values

*8.1.2.1. Derived No Effect Level / Derived minimal effect level*

**Sodium carbonate**

- Workers, Inhalation, Long-term exposure, Local effects, 10 mg/m3
- Consumers, Inhalation, Short-term exposure, Local effects, 10 mg/m3

### 8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Provide appropriate exhaust ventilation at places where dust is formed.
- Apply technical measures to comply with the occupational exposure limits.

8.2.2. Individual protection measures

*8.2.2.1. Respiratory protection*

- Effective dust mask.

*8.2.2.2. Hand protection*

- Wear suitable gloves.
- Suitable material: Neoprene, Natural Rubber

*8.2.2.3. Eye protection*

- Safety goggles

*8.2.2.4. Skin and body protection*

- Dust impervious protective suit
- Rubber or plastic boots
- Rubber or plastic apron

*8.2.2.5. Hygiene measures*

- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using, do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

8.2.3. Environmental exposure controls

- Dispose of rinse water in accordance with local and national regulations.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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

9.1.1. General Information

| | |
|---|---|
| **Appearance** | powder |
| **Colour** | white |
| **Odour** | odourless |
| **Molecular weight** | 106 g/mol |

9.1.2. Important health safety and environmental information

| | |
|---|---|
| **pH** | 11.16; at 4 g/l, 25 °C |
| | 11.3; at 10 g/l, 25 °C |
| **pKa** | pKa1= 6.35; pKa2 = 10.33 |
| **Melting point/freezing point** | 851 °C |
| **Boiling point/boiling range** | not applicable |
| **Flash point** | not applicable |
| **Evaporation rate** | not applicable |
| **Flammability (solid, gas)** | not applicable |
| **Flammability** | not applicable |
| **Explosive properties** | not applicable |
| **Vapour pressure** | negligible |
| **Vapour density** | not applicable |
| **Relative density** | 2.53, at 20 °C |
| **Bulk density** | 0.97 - 1.10 kg/dm3, , Free flow |
| **Solubility(ies)** | = 71 g/l, Water, at 0 °C |
| | = 212.5 g/l, Water, at 20 °C |
| **Solubility/qualitative** | No data |
| **Partition coefficient: n-octanol/water** | not applicable |
| **Auto-ignition temperature** | not applicable |
| **Decomposition temperature** | > 400 °C |

- **Viscosity** not applicable
- **Oxidizing properties** Non oxidizer

**9.2. Other information**

- Granulometry 85 - 90 % > 125 µm

## SECTION 10. STABILITY AND REACTIVITY

**10.1. Reactivity**

- Decomposes by reaction with strong acids.

**10.2. Chemical stability**

- Stable under recommended storage conditions.

**10.3. Possibility of hazardous reactions**

- none

**10.4. Conditions to avoid**

- Exposure to moisture.

**10.5. Incompatible materials**

- Finely divided aluminium

**10.6. Hazardous decomposition products**

- none

## SECTION 11. TOXICOLOGICAL INFORMATION

**11.1. Acute toxicity**

11.1.1. Acute oral toxicity

- LD50, rat, 2,800 mg/kg

11.1.2. Acute inhalation toxicity

- LC50, 2 h, guinea pig , 0.8 mg/l
- LC50, 2 h, mouse , 1.2 mg/l
- LC50, 2 h, rat , 2.3 mg/l

11.1.3. Acute dermal toxicity

- LD50, rabbit, > 2,000 mg/kg

**11.2. Skin corrosion/irritation**

- rabbit, No skin irritation
- Human experience, No skin irritation

**11.3. Serious eye damage/eye irritation**

- rabbit, irritant effects

**11.4. Respiratory or skin sensitisation**

- No data available

**11.5. Germ cell mutagenicity**

- In vitro tests did not show mutagenic effects

**11.6. Carcinogenicity**

- No carcinogenic effects have been observed

**11.7. Reproductive toxicity**

- Oral route (gavage), 10 days, Various species, 179 mg/kg, Did not show teratogenic effects in animal experiments.

**11.8. Specific target organ toxicity - single exposure**

- Remarks: Not classified

**11.9. Specific target organ toxicity - repeated exposure**

- Remarks: not applicable, Degradation

**11.10. Aspiration hazard**

- No data available

## SECTION 12. ECOLOGICAL INFORMATION

**12.1. Toxicity**

- Fishes, Lepomis macrochirus, LC50, 96 h, 300 mg/l
- Crustaceans, Ceriodaphnia dubia, EC50, 48 h, 200 - 227 mg/l

**12.2. Persistence and degradability**

12.2.1. Abiotic degradation

- Water, hydrolyses
  Result: acid/base equilibrium as a function of pH
  Degradation products: carbonic acid/bicarbonate/carbonate

12.2.2. Biodegradation

- The methods for determining the biological degradability are not applicable to inorganic substances.

**12.3. Bioaccumulative potential**

- Result: Does not bioaccumulate.

**12.4. Mobility in soil**

- Air
  not applicable
- Water
  Solubility(ies)
- Water
  Mobility
- Soil/sediments
  not significant

**12.5. Results of PBT and vPvB assessment**

- According to Annex XIII of regulation (EC) 1907/2006 a PBT and vPvB assessment shall not be conducted for inorganic substances.
- This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
- This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

**12.6. Other adverse effects**

- No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

**13.1. Waste treatment methods**

- Contact waste disposal services.
- If recycling is not practicable, dispose of in compliance with local regulations.
- Dilute with plenty of water.
- Neutralise with acid.
- In accordance with local and national regulations.

### 13.2. Contaminated packaging

- Where possible recycling is preferred to disposal or incineration.
- Clean container with water.
- Dispose of rinse water in accordance with local and national regulations.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.

## SECTION 14. TRANSPORT INFORMATION

**International transport regulations**

- not regulated

## SECTION 15. REGULATORY INFORMATION

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

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), as amended
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, as amended
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, as amended
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work,as amended
- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste

### 15.1.1. Notification status

| Inventory Information | Status |
|---|---|
| Australia. Inventory of Chemical Substances (AICS) | - In compliance with inventory |
| Canada. Domestic Substances List (DSL) | - In compliance with inventory |
| Korea. Existing Chemicals Inventory (KECI (KR)) | - In compliance with inventory |
| EU list of existing chemical substances (EINECS) | - In compliance with inventory |
| Japan. Inventory of Existing & New Chemical Substances (ENCS) | - In compliance with inventory |
| China. Inventory of Existing Chemical Substances (IECSC) | - In compliance with inventory |
| Philippine. Inventory of Chemicals and Chemical Substances (PICCS) | - In compliance with inventory |
| USA. Toxic Substances Control Act (TSCA) | - In compliance with inventory |
| New Zealand. Inventory of Chemicals (NZIOC) | - In compliance with inventory |
| Mexico INSQ (INSQ) | - In compliance with inventory |

### 15.2. Chemical Safety Assessment

- A Chemical Safety Assessment has been carried out for this substance.
- See Exposure scenario

## SECTION 16. OTHER INFORMATION

### 16.1. Full text of R-phrases referred to under sections 2 and 3

16.1.1. Full text of R-phrases referred to under section 2

R36 - Irritating to eyes.

### 16.2. Other information

- Update
  This data sheet contains changes from the previous version in section(s): 2, 11, 12, 14

This SDS is only intended for the indicated country to which it is applicable. The European SDS format compliant with the applicable European legislation is not intended for use nor distribution in countries outside the European Union with the exception of Norway and Switzerland. Safety datasheets applicable in other countries/regions are available upon request.
The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.

Print Date: 02.07.2014

# Annex

## Scenario List



### 1. ES1 : Manufacturing

#### 1.1. Scenario description

| | | | |
|---|---|---|---|
| Main User Groups | : | **SU 3** | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sectors of end-use | : | **SU8** | Manufacture of bulk, large scale chemicals (including petroleum products) |
| Environmental release category | : | **ERC1** | Manufacture of substances |
| Process category | : | **PROC1** | Use in closed process, no likelihood of exposure |
| | | **PROC2** | Use in closed, continuous process with occasional controlled exposure |
| | | **PROC3** | Use in closed batch process (synthesis or formulation) |
| | | **PROC4** | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | | **PROC8a** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities |
| | | **PROC8b** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities |
| | | **PROC9** | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | | **PROC22** | Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting |

#### 1.2. Conditions of use affecting exposure

#### 1.2.1 Contributing scenario controlling environmental exposure for: ERC1 Manufacture of substances

The environmental release is considered negligible.

**Product characteristics**

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

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | none |

**1.2.2 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure , PROC2 Use in closed, continuous process with occasional controlled exposure , PROC3 Use in closed batch process (synthesis or formulation) , PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises , PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) , OC2 Solid, medium dustiness**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently). |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Provide appropriate exhaust ventilation at places where dust is formed.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**1.2.3 Contributing scenario controlling worker exposure for: PROC22 Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting , OC2 Solid, medium dustiness**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently). |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Provide appropriate exhaust ventilation at places where dust is formed.

**Organisational measures to prevent /limit releases, dispersion and exposure**
Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

## 1.3. Exposure estimation and reference to its source

**Environment**

| Release factor | Value type | Compartment | Environmental exposure | RCR |
|---|---|---|---|---|
| ERC1 | | All | | No exposure assessment for the environment as the product is of low concern. |
| | | Air | 118 kg/day | |

**Human Health**

| Contributing Scenario | Specific conditions | Value type | Level of Exposure | RCR |
|---|---|---|---|---|
| PROC1 | | Worker - inhalative, long-term - systemic | 0.01 mg/m³ | 0.001 |
| PROC2 | | Worker - inhalative, long-term - systemic | 0.5 mg/m³ | 0.05 |
| PROC3 | | Worker - inhalative, long-term - systemic | 1 mg/m³ | 0.1 |
| PROC4, PROC8a, PROC8b, PROC9 | | Worker - inhalative, long-term - systemic | 5 mg/m³ | 0.5 |
| PROC22 | | Worker - inhalative, long-term - systemic | 1 mg/m³ | 0.1 |

RCR = Risk characterisation ratio

ERC1
PROC1 Exposure Assessment Method : ECETOC TRA v2.0 Worker
PROC2 Exposure Assessment Method : ECETOC TRA v2.0 Worker
PROC3 Exposure Assessment Method : ECETOC TRA v2.0 Worker
PROC4, PROC8a, PROC8b, PROC9 Exposure Assessment Method : ECETOC TRA v2.0 Worker
PROC22 Exposure Assessment Method : ECETOC TRA v2.0 Worker

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

### 1.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

### 1.4.2 Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## 2. ES2 : Industrial use, Glass industry

### 2.1. Scenario description

| | | | |
|---|---|---|---|
| Main User Groups | : | **SU 3** | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sectors of end-use | : | **SU13** | Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| Environmental release category | : | **ERC6a** | Industrial use resulting in manufacture of another substance (use of intermediates) |
| Process category | : | **PROC1** | Use in closed process, no likelihood of exposure |
| | | **PROC2** | Use in closed, continuous process with occasional controlled exposure |
| | | **PROC3** | Use in closed batch process (synthesis or formulation) |
| | | **PROC4** | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | | **PROC8a** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities |
| | | **PROC8b** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities |
| | | **PROC22** | Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting |
| | | **PROC23** | Open processing and transfer operations with minerals/ metals at elevated temperature |
| | | **PROC26** | Handling of solid inorganic substances at ambient temperature |

### 2.2. Conditions of use affecting exposure

#### 2.2.1 Contributing scenario controlling environmental exposure for: ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

The environmental release is considered negligible.

**Product characteristics**

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

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal STP |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | Air filtration – particle removal, Can be landfilled, when in compliance with local regulations. |

**Conditions and measures related to external recovery of waste**

| | | |
|---|---|---|
| Remarks | : | If recycling is not practicable, dispose of in compliance with local regulations. |

**2.2.2 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure , PROC2 Use in closed, continuous process with occasional controlled exposure , PROC3 Use in closed batch process (synthesis or formulation) , PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises , PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC26 Handling of solid inorganic substances at ambient temperature , OC2 Solid, medium dustiness**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently). |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Provide appropriate exhaust ventilation at places where dust is formed.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**2.2.3 Contributing scenario controlling worker exposure for: PROC22 Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting , PROC23 Open processing and transfer operations with minerals/ metals at elevated temperature , OC6 Solid, high dustiness**

**Product characteristics**

| | | |
|---|---|---|
| Concentration of the Substance in Mixture/Article | | Covers the percentage of the substance in the product up to 25 %. |
| Physical Form (at time of use) | : | Solid, high dustiness |

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently). |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Provide appropriate exhaust ventilation at places where dust is formed.

**Organisational measures to prevent /limit releases, dispersion and exposure**
Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

## 2.3. Exposure estimation and reference to its source

**Environment**

| Release factor | Value type | Compartment | Environmental exposure | RCR |
|---|---|---|---|---|
| ERC6a | | All | | No exposure assessment for the environment as the product is of low concern. |

**Human Health**

| Contributing Scenario | Specific conditions | Value type | Level of Exposure | RCR |
|---|---|---|---|---|
| PROC1 | | Worker - inhalative, long-term - systemic | 0.01 mg/m³ | 0.001 |
| PROC2 | | Worker - inhalative, long-term - systemic | 0.5 mg/m³ | 0.05 |
| PROC3 | | Worker - inhalative, long-term - systemic | 1 mg/m³ | 0.1 |
| PROC4, PROC8a, PROC8b | | Worker - inhalative, long-term - systemic | 5 mg/m³ | 0.5 |
| PROC22, PROC23 | | Worker - inhalative, long-term - systemic | 1 mg/m³ | 0.1 |

RCR = Risk characterisation ratio

| | |
|---|---|
| ERC6a | |
| PROC1 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC2 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC3 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC4, PROC8a, PROC8b | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC22, PROC23 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |

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

### 2.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.

The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**2.4.2 Health**

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## 3. ES3 : Industrial use, Formulation

### 3.1. Scenario description

| | | | |
|---|---|---|---|
| Main User Groups | : | **SU 3** | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sectors of end-use | : | **SU 10** | Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) |
| Environmental release category | : | **ERC2** | Formulation of preparations |
| Process category | : | **PROC1** | Use in closed process, no likelihood of exposure |
| | | **PROC2** | Use in closed, continuous process with occasional controlled exposure |
| | | **PROC3** | Use in closed batch process (synthesis or formulation) |
| | | **PROC4** | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | | **PROC5** | Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) |
| | | **PROC8a** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities |
| | | **PROC8b** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities |
| | | **PROC9** | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | | **PROC14** | Production of preparations or articles by tabletting, compression, extrusion, pelletisation |
| | | **PROC15** | Use as laboratory reagent |

### 3.2. Conditions of use affecting exposure

### 3.2.1 Contributing scenario controlling environmental exposure for: ERC2 Formulation of preparations

**Product characteristics**

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

**Technical conditions and measures / Organizational measures**

| | | |
|---|---|---|
| Water | : | pH adjustment |

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal STP |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | Air filtration – particle removal |

**3.2.2 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure , PROC2 Use in closed, continuous process with occasional controlled exposure , PROC3 Use in closed batch process (synthesis or formulation) , PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises , PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact) , PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) , PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation , PROC15 Use as laboratory reagent**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently). |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Use only in area provided with appropriate exhaust ventilation.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

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

**Environment**

| Release factor | Value type | Compartment | Environmental exposure | RCR |
|---|---|---|---|---|
| ERC2 | | All | | No exposure assessment for the environment as the product is of low concern. |

**Human Health**

| Contributing Scenario | Specific conditions | Value type | Level of Exposure | RCR |
|---|---|---|---|---|
| PROC1 | | Worker - inhalative, long-term - systemic | 0.01 mg/m³ | 0.001 |
| PROC2, PROC15 | | Worker - inhalative, long-term - systemic | 0.5 mg/m³ | 0.05 |
| PROC3, PROC14 | | Worker - inhalative, long-term - systemic | 1 mg/m³ | 0.1 |
| PROC4, PROC5, PROC8a, PROC8b, PROC9 | | Worker - inhalative, long-term - systemic | 5 mg/m³ | 0.5 |

RCR = Risk characterisation ratio

ERC2

| | |
|---|---|
| PROC1 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC2, PROC15 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC3, PROC14 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC4, PROC5, PROC8a, PROC8b, PROC9 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |

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

**3.4.1 Environment**

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**3.4.2 Health**

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## 4. ES4 : Industrial use, and, Professional use

### 4.1. Scenario description

| | | | |
|---|---|---|---|
| Main User Groups | : | **SU 3** | Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sectors of end-use | : | **SU0** | Other |
| | | **SU1** | Agriculture, forestry, fishery |
| | | **SU2a** | Mining, (without offshore industries) |
| | | **SU2b** | Offshore industries |
| | | **SU3** | Industrial Manufacturing (all) |
| | | **SU4** | Manufacture of food products |
| | | **SU5** | Manufacture of textiles, leather, fur |
| | | **SU6a** | Manufacture of wood and wood products |
| | | **SU6b** | Manufacture of pulp, paper and paper products |
| | | **SU7** | Printing and reproduction of recorded media |
| | | **SU8** | Manufacture of bulk, large scale chemicals (including petroleum products) |
| | | **SU9** | Manufacture of fine chemicals |
| | | **SU 10** | Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) |
| | | **SU11** | Manufacture of rubber products |
| | | **SU12** | Manufacture of plastics products, including compounding and conversion |
| | | **SU13** | Manufacture of other non-metallic mineral products, e.g. plasters, cement |
| | | **SU14** | Manufacture of basic metals, including alloys |
| | | **SU15** | Manufacture of fabricated metal products, except machinery and equipment |
| | | **SU16** | Manufacture of computer, electronic and optical products, electrical equipment |
| | | **SU17** | General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment |
| | | **SU18** | Manufacture of furniture |
| | | **SU19** | Building and construction work |
| | | **SU20** | Health services |
| | | **SU 22** | Professional uses: Public domain (administration, education, entertainment, services, craftsmen) |
| | | **SU23** | Electricity, steam, gas water supply and sewage treatment |
| | | **SU24** | Scientific research and development |
| Environmental release category | : | **ERC4** | Industrial use of processing aids in processes and products, not becoming part of articles |
| | | **ERC5** | Industrial use resulting in inclusion into or onto a matrix |
| | | **ERC6a** | Industrial use resulting in manufacture of another substance (use of intermediates) |
| | | **ERC6b** | Industrial use of reactive processing aids |
| | | **ERC6d** | Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers |
| | | **ERC7** | Industrial use of substances in closed systems |
| | | **ERC8a** | Wide dispersive indoor use of processing aids in open systems |
| | | **ERC8b** | Wide dispersive indoor use of reactive substances in open systems |
| | | **ERC8c** | Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | | **ERC8d** | Wide dispersive outdoor use of processing aids in open systems |
| | | **ERC8e** | Wide dispersive outdoor use of reactive substances in open |

| | | | |
|---|---|---|---|
| | | | systems |
| | | **ERC8f** | Wide dispersive outdoor use resulting in inclusion into or onto a matrix |
| | | **ERC9a** | Wide dispersive indoor use of substances in closed systems |
| | | **ERC9b** | Wide dispersive outdoor use of substances in closed systems |
| Process category | : | **PROC1** | Use in closed process, no likelihood of exposure |
| | | **PROC2** | Use in closed, continuous process with occasional controlled exposure |
| | | **PROC3** | Use in closed batch process (synthesis or formulation) |
| | | **PROC4** | Use in batch and other process (synthesis) where opportunity for exposure arises |
| | | **PROC7** | Industrial spraying |
| | | **PROC8a** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities |
| | | **PROC8b** | Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities |
| | | **PROC9** | Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| | | **PROC10** | Roller application or brushing |
| | | **PROC11** | Non industrial spraying |
| | | **PROC13** | Treatment of articles by dipping and pouring |
| | | **PROC15** | Use as laboratory reagent |
| | | **PROC17** | Lubrication at high energy conditions and in partly open process |
| | | **PROC18** | Greasing at high energy conditions |
| | | **PROC19** | Hand-mixing with intimate contact and only PPE available |
| | | **PROC22** | Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting |
| | | **PROC23** | Open processing and transfer operations with minerals/ metals at elevated temperature |
| | | **PROC26** | Handling of solid inorganic substances at ambient temperature |
| Product category | : | | All relevant product categories |

## 4.2. Conditions of use affecting exposure

### 4.2.1 Contributing scenario controlling environmental exposure for: ERC4 Industrial use of processing aids in processes and products, not becoming part of articles, ERC5 Industrial use resulting in inclusion into or onto a matrix, ERC6a Industrial use resulting in manufacture of another substance (use of intermediates), ERC6b Industrial use of reactive processing aids, ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, ERC7 Industrial use of substances in closed systems

The environmental release is considered negligible.

**Product characteristics**

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

**Technical conditions and measures / Organizational measures**

| | | |
|---|---|---|
| Water | : | pH adjustment |

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal STP |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | Air filtration – particle removal |

**4.2.2 Contributing scenario controlling environmental exposure for: ERC8a Wide dispersive indoor use of processing aids in open systems, ERC8b Wide dispersive indoor use of reactive substances in open systems, ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix, ERC8d Wide dispersive outdoor use of processing aids in open systems, ERC8e Wide dispersive outdoor use of reactive substances in open systems, ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix, ERC9a Wide dispersive indoor use of substances in closed systems, ERC9b Wide dispersive outdoor use of substances in closed systems, Professional use**

The environmental release is considered negligible.

**Product characteristics**

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

**Technical conditions and measures / Organizational measures**

| | | |
|---|---|---|
| Water | : | pH adjustment |

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal STP |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | Air filtration – particle removal |

**4.2.3 Contributing scenario controlling worker exposure for: PROC3 Use in closed batch process (synthesis or formulation) , PROC7 Industrial spraying , PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) , PROC17 Lubrication at high energy conditions and in partly open process , PROC18 Greasing at high energy conditions , Professional use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | > 4 hours/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Use only in area provided with appropriate exhaust ventilation.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.4 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure , PROC2 Use in closed, continuous process with occasional controlled exposure , Professional use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | < 15 minutes/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Use only in area provided with appropriate exhaust ventilation.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.5 Contributing scenario controlling worker exposure for: PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises , PROC10 Roller application or brushing , PROC11 Non industrial spraying , Professional use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | > 4 hours/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**

Use only in area provided with appropriate exhaust ventilation.

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.6 Contributing scenario controlling worker exposure for: PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC13 Treatment of articles by dipping and pouring , PROC15 Use as laboratory reagent , PROC19 Hand-mixing with intimate contact and only PPE available , Professional use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | < 1 hours/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Organisational measures to prevent /limit releases, dispersion and exposure**
Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.7 Contributing scenario controlling worker exposure for: PROC1 Use in closed process, no likelihood of exposure , PROC2 Use in closed, continuous process with occasional controlled exposure , PROC3 Use in closed batch process (synthesis or formulation) , PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises , PROC8a Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities , PROC8b Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities , PROC10 Roller application or brushing , PROC11 Non industrial spraying , PROC13 Treatment of articles by dipping and pouring , PROC15 Use as laboratory reagent , PROC19 Hand-mixing with intimate contact and only PPE available , Industrial use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | > 4 hours/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Technical conditions and measures**
Use only in area provided with appropriate exhaust ventilation.

**Organisational measures to prevent /limit releases, dispersion and exposure**
Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.8 Contributing scenario controlling worker exposure for: PROC3 Use in closed batch process (synthesis or formulation) , PROC7 Industrial spraying , PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) , PROC17 Lubrication at high energy conditions and in partly open process , PROC18 Greasing at high energy conditions , Industrial use**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | > 4 hours/day |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Outdoor / Indoor | : | Indoor |

**Organisational measures to prevent /limit releases, dispersion and exposure**
Assumes a good basic standard of occupational hygiene is implemented.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

**4.2.9 Contributing scenario controlling worker exposure for: Industrial use , PROC22 Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting , PROC23 Open processing and transfer operations with minerals/ metals at elevated temperature**

**Product characteristics**

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

**Frequency and duration of use**

| | | |
|---|---|---|
| Frequency of use | : | > 4 hours/day |

**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor

**Organisational measures to prevent /limit releases, dispersion and exposure**

Assumes a good basic standard of occupational hygiene is implemented.

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

Safety goggles, Protective gloves, Wear suitable working clothes., In case of dust clouds, effective dust mask. Smoking, eating and drinking should be prohibited in the application area., Wash hands before breaks and at the end of workday.

## 4.3. Exposure estimation and reference to its source

### Environment

| Release factor | Value type | Compartment | Environmental exposure | RCR |
|---|---|---|---|---|
| ERC4, ERC5, ERC6a, ERC6b, ERC6d, SU7 | | All | | No exposure assessment for the environment as the product is of low concern. |
| ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a, ERC9b | | All | | No exposure assessment for the environment as the product is of low concern. |

### Human Health

| Contributing Scenario | Specific conditions | Value type | Level of Exposure | RCR |
|---|---|---|---|---|
| PROC3, PROC9 | Industrial use, liquid | Worker - inhalative, long-term - systemic | 0.044 mg/m³ | <= 0.5 |
| PROC7, PROC17, PROC18 | Professional use, not applicable | Worker - inhalative, long-term - systemic | | |
| PROC1 | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.0044 mg/m³ | <= 0.5 |
| PROC1 | Professional use, solid | Worker - inhalative, long-term - systemic | 0.001 mg/m³ | <= 0.5 |
| PROC2 | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.044 mg/m³ | <= 0.5 |
| PROC2 | Professional use, solid | Worker - inhalative, long-term - systemic | 0.1 mg/m³ | <= 0.5 |
| SU1 | Professional use, solid, Outdoor use | | 0.142 mg/m³ | <= 0.5 |
| PROC4 | Professional use, solid | Worker - inhalative, long-term - systemic | 5 mg/m³ | <= 0.5 |
| PROC4 | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.004 mg/m³ | <= 0.5 |
| PROC10, PROC11 | Professional use, Liquid mixture | Worker - inhalative, long-term - systemic | 0.44 mg/m³ | <= 0.5 |
| PROC8a | Professional use, solid | Worker - inhalative, long-term - systemic | 1 mg/m³ | <= 0.5 |
| PROC8a | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.088 mg/m³ | <= 0.5 |
| PROC8b | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.088 mg/m³ | <= 0.5 |
| PROC19 | Professional use, liquid | Worker - inhalative, long-term - systemic | 0.088 mg/m³ | <= 0.5 |
| PROC19 | Professional use, solid | Worker - inhalative, long-term - systemic | 1 mg/m³ | <= 0.5 |
| PROC13, PROC15 | Professional use, Liquid mixture | Worker - inhalative, long-term - systemic | 0.088 mg/m³ | <= 0.5 |
| PROC1 | Industrial use | Worker - inhalative, long-term - systemic | 0.01 mg/m³ | <= 0.5 |

| | | | | |
|---|---|---|---|---|
| PROC2 | Industrial use, solid | Worker - inhalative, long-term - systemic | 0.5 mg/m³ | <= 0.5 |
| PROC4, PROC8a, PROC19 | Industrial use | Worker - inhalative, long-term - systemic | 5 mg/m³ | <= 0.5 |
| PROC8b, PROC15 | Industrial use, solid | Worker - inhalative, long-term - systemic | 5 mg/m³ | <= 0.5 |
| PROC10, PROC11, PROC13 | not applicable | | | |
| PROC3 | Industrial use, solid | Worker - inhalative, long-term - systemic | 1 mg/m³ | <= 0.5 |
| PROC7 | Industrial use | Worker - inhalative, long-term - systemic | 0.022 mg/m³ | <= 0.5 |
| PROC9 | Industrial use, solid | Worker - inhalative, long-term - systemic | 5 mg/m³ | <= 0.5 |
| PROC17, PROC18 | Industrial use, Liquid mixture | Worker - inhalative, long-term - systemic | 0.022 mg/m³ | <= 0.5 |
| PROC22, PROC23 | Industrial use, Solid, high dustiness | Worker - inhalative, long-term - systemic | 1 mg/m³ | <= 0.5 |

RCR = Risk characterisation ratio

| | |
|---|---|
| ERC4, ERC5, ERC6a, ERC6b, ERC6d, SU7 ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a, ERC9b | |
| PROC3, PROC9 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC7, PROC17, PROC18 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC1 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC1 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC2 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC2 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| SU1 | Exposure Assessment Method : ECPA OWB |
| PROC4 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC4 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC10, PROC11 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC8a | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC8a | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC8b | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC19 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC19 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC13, PROC15 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC1 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC2 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC4, PROC8a, PROC19 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC8b, | Exposure Assessment Method : ECETOC TRA v2.0 Worker |

| | |
|---|---|
| PROC15<br>PROC10,<br>PROC11,<br>PROC13 | |
| PROC3 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC7 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC9 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC17,<br>PROC18 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |
| PROC22,<br>PROC23 | Exposure Assessment Method : ECETOC TRA v2.0 Worker |

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

### 4.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
- release factor prior to on-site treatment
- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

### 4.4.2 Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

## 5. ES5 : Consumer use

### 5.1. Scenario description

| | | | |
|---|---|---|---|
| Main User Groups | : | **SU 21** | Consumer uses: Private households (= general public = consumers) |
| Sectors of end-use | : | **SU 21** | Consumer uses: Private households (= general public = consumers) |
| Environmental release category | : | **ERC8a** | Wide dispersive indoor use of processing aids in open systems |
| | | **ERC8b** | Wide dispersive indoor use of reactive substances in open systems |
| | | **ERC8c** | Wide dispersive indoor use resulting in inclusion into or onto a matrix |
| | | **ERC8d** | Wide dispersive outdoor use of processing aids in open systems |
| | | **ERC8e** | Wide dispersive outdoor use of reactive substances in open systems |
| | | **ERC8f** | Wide dispersive outdoor use resulting in inclusion into or onto a matrix |
| | | **ERC9a** | Wide dispersive indoor use of substances in closed systems |
| | | **ERC9b** | Wide dispersive outdoor use of substances in closed systems |
| Product category | : | | All relevant product categories |

### 5.2. Conditions of use affecting exposure

**5.2.1 Contributing scenario controlling environmental exposure for: ERC8a Wide dispersive indoor use of processing aids in open systems, ERC8b Wide dispersive indoor use of reactive substances in open systems, ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix, ERC8d Wide dispersive outdoor use of processing aids in open systems, ERC8e Wide dispersive outdoor use of reactive substances in open systems, ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix, ERC9a Wide dispersive indoor use of substances in closed systems, ERC9b Wide dispersive outdoor use of substances in closed systems**

The environmental release is considered negligible.

**Product characteristics**

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

**Conditions and measures related to sewage treatment plant**

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal STP |

**5.2.2Contributing scenario controlling consumer exposure for: PC0 Other (use UCN codes) All relevant product categories**

**Product characteristics**

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

**Amount**

| | | |
|---|---|---|
| Amount used per event | : | 10 g/l |

**Frequency and duration of use**

Frequency of use : 5 min
Frequency of use : 1 days/week

**Conditions and measures related to protection of consumer (e.g. behavioural advice, personal protection and hygiene)**

Consumer Measures : Keep out of the reach of children., Avoid contact with eyes., In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

## 5.3. Exposure estimation and reference to its source

**Environment**

| Release factor | Value type | Compartment | Environmental exposure | RCR |
|---|---|---|---|---|
| ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f, ERC9a, ERC9b | | All | | No exposure assessment for the environment as the product is of low concern. |

**Human Health**

| Contributing Scenario | Specific conditions | Value type | Level of Exposure | RCR |
|---|---|---|---|---|
| | A quantitative risk assessment is not required by inhalation since the exposure is considered as negligible | | | |
| PC35, AISE-SP-C0001 | powder | Consumer - dermal, long-term - systemic | 0.036 mg/kg/day | |
| PC35, AISE-SP-C0001 | liquid | Consumer - dermal, long-term - systemic | 0.053 mg/kg/day | |
| PC35, AISE-SP-C0002 | powder | Consumer - dermal, long-term - systemic | 0.037 mg/kg/day | |
| PC35, AISE-SP-C0002 | liquid, gel | Consumer - dermal, long-term - systemic | 0.053 mg/kg/day | |
| PC35, AISE-SP-C0004 | liquid | Consumer - dermal, long-term - systemic | 0.052 mg/kg/day | |
| PC35, AISE-SP-C0005 | | Consumer - dermal, long-term - systemic | 0.0007 mg/kg/day | |
| PC35, AISE-SP-C0007 | gel | Consumer - dermal, long-term - systemic | 0.1 mg/kg/day | |

RCR = Risk characterisation ratio

ERC8a, ERC8b,
ERC8c, ERC8d,
ERC8e, ERC8f,
ERC9a, ERC9b

PC35, AISE-SP- Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool

| | |
|---|---|
| C0001 | (REACT) |
| PC35, AISE-SP-C0001 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |
| PC35, AISE-SP-C0002 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |
| PC35, AISE-SP-C0002 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |
| PC35, AISE-SP-C0004 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |
| PC35, AISE-SP-C0005 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |
| PC35, AISE-SP-C0007 | Exposure Assessment Method : AISE Reach Exposure Assessment Consumer Tool (REACT) |

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

### 5.4.1 Environment

If a DU has OC/RMMs outside specifications in the ES, then the DU can evaluate whether he works inside the boundaries set by the ES through scaling in EUSES.
The main driving parameters are :
- local amount used (tonnage)
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- on-site wastewater treatment presence and efficiency
- dilution factor

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

### 5.4.2 Health

A quantitative risk assessment is not required by inhalation since the exposure is considered as negligible, For dermal route, available hazard data do not support the need for a DNEL to be established