**EXPOSURE SCENARIO FOR COMMUNICATION**

**Substance Name:** calcium chloride

**EC Number:** 233-140-8

**CAS Number:** 10043-52-4

**Registration Number:**

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**1. ES 1: Manufacture**

**1.1. Title section**

ES name: Manufacture

|  |  |
| --- | --- |
| **Environment** |  |
| 1: *Manufacturing of substances* | ERC 1 |
| **Worker** |  |
| 2: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment condition* | PROC 1 |
| 3: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment condition* | PROC 2 |
| 4: *Manufacture in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* | PROC 3 |
| 5: Chemical production where opportunity for exposure arises | PROC 4 |
| 6: *Transfer of a substance or mixture during process sampling at dedicated facilities* | PROC 8b, PROC 26 |
| 7: *Transfer of a substance or mixture during process sampling at non-dedicated facilities* | PROC 8a, PROC 26 |
| 8: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* | PROC 9, PROC 26 |
| 9: Tabletting, compression, extrusion, pelettisation, granulation | PROC 14 |
| 10: Use as laboratory reagent | PROC 15, PROC 26 |
| 11: *Transfer of substance or mixture (charging/discharging) at non dedicated-facilities* | PROC 8a, PROC 26 |
| 12: *Transfer of substance or mixture (charging/discharging) at dedicated-facilities* | PROC 8b, PROC 26 |
| 13: *Equipment cleaning and maintenance at non-dedicated facility* | PROC 8a, PROC 28 |
| 14: Handling of solid inorganic substances at ambient temperature | PROC 26 |
| 15: *Manual maintenance (cleaning and repair) of machinery at non-dedicated facility* | PROC 28 |

**1.2. Conditions of use affecting exposure**

**1.2.1. Control of worker exposure**

**Conditions of use applicable to all contributing scenarios**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 8 h/day |
| **Technical and organisational conditions and measures** |
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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

**1.3.1. Worker exposure: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment condition* (PROC 1)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.774 mg/m³ (Measured data) | 0.355 |
| Inhalation, local, acute | 1.774 mg/m³ (Measured data) | 0.177 |

**1.3.2. Worker exposure: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment condition* (PROC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.774 mg/m³ (Measured data) | 0.355 |
| Inhalation, local, acute | 1.774 mg/m³ (Measured data) | 0.177 |

**1.3.3. Worker exposure: *Manufacture in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* (PROC 3)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.774 mg/m³ (Measured data) | 0.355 |
| Inhalation, local, acute | 1.774 mg/m³ (Measured data) | 0.177 |

**1.3.4. Worker exposure: Chemical production where opportunity for exposure arises (PROC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.881 mg/m³ (Measured data) | 0.376 |
| Inhalation, local, acute | 1.881 mg/m³ (Measured data) | 0.188 |

**1.3.5. Worker exposure: *Transfer of a substance or mixture during process sampling at dedicated facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.6. Worker exposure: *Transfer of a substance or mixture during process sampling at non-dedicated facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.7. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.8. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.9. Worker exposure: Use as laboratory reagent (PROC 15, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.774 mg/m³ (Measured data) | 0.355 |
| Inhalation, local, acute | 1.774 mg/m³ (Measured data) | 0.177 |

**1.3.10. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non dedicated-facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.11. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated-facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.12. Worker exposure: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.13. Worker exposure: Handling of solid inorganic substances at ambient temperature (PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

**1.3.14. Worker exposure: *Manual maintenance (cleaning and repair) of machinery at non-dedicated facility* (PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 2.742 mg/m³ (Measured data) | 0.548 |
| Inhalation, local, acute | 2.742 mg/m³ (Measured data) | 0.274 |

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

**2. ES 2: Formulation or re-packing**

**2.1. Title section**

ES name: Formulation or re-packing; Distribution of substance

|  |  |
| --- | --- |
| **Environment** |  |
| 1: Formulation into mixture | ERC 2 |
| **Worker** |  |
| 2: *Chemical production in closed process without likelihood of exposure or in containment conditions.* | PROC 1 |
| 3: *Chemical production in closed continuous process with occasional controlled exposure.* | PROC 2 |
| 4: *Formulation in closed batch processes with occasional controlled exposure.* | PROC 3 |
| 5: *Chemical production where opportunity for exposure arises* | PROC 4 |
| 6: Mixing or blending in batch processes | PROC 5 |
| 7: *Transfer of a substance or mixture during process sampling at dedicated facilities* | PROC 8b, PROC 26 |
| 8: *Transfer of a substance or mixture during process sampling at non-dedicated facilities* | PROC 8a, PROC 26 |
| 9: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* | PROC 9, PROC 26 |
| 10: Use as laboratory reagent | PROC 15, PROC 26 |
| 11: Tabletting, compression, extrusion, pelettisation, granulation | PROC 14 |
| 12: *Transfer of substance or mixture (charging/discharging) at non dedicated-facilities* | PROC 8a, PROC 26 |
| 13: *Transfer of substance or mixture (charging/discharging) at dedicated-facilities* | PROC 8b, PROC 26 |
| 14: *Equipment cleaning and maintenance at non-dedicated facility* | PROC 8a, PROC 28 |
| 15: Manual maintenance (cleaning and repair) of machinery | PROC 28 |

**2.2. Conditions of use affecting exposure**

**2.2.1. Control of worker exposure**

**Conditions of use applicable to all contributing scenarios**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| *Use suitable eye protection.* |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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**Specific conditions of use per contributing scenario**

|  |  |
| --- | --- |
| **Contributing scenario** | **Specific conditions of use** |
| ***Chemical production in closed process without likelihood of exposure or in containment conditions.* (PROC 1)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| ***Chemical production in closed continuous process with occasional controlled exposure.* (PROC 2)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| ***Formulation in closed batch processes with occasional controlled exposure.* (PROC 3)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| ***Chemical production where opportunity for exposure arises* (PROC 4)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| **Mixing or blending in batch processes (PROC 5)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| ***Transfer of a substance or mixture during process sampling at dedicated facilities* (PROC 8b, PROC 26)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| ***Transfer of a substance or mixture during process sampling at non-dedicated facilities* (PROC 8a, PROC 26)** | Covers use up to 1 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| ***Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| **Use as laboratory reagent (PROC 15, PROC 26)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| ***Transfer of substance or mixture (charging/discharging) at non dedicated-facilities* (PROC 8a, PROC 26)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| ***Transfer of substance or mixture (charging/discharging) at dedicated-facilities* (PROC 8b, PROC 26)** | Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| ***Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| **Manual maintenance (cleaning and repair) of machinery (PROC 28)** | Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |

**2.3. Exposure estimation and reference to its source**

**2.3.1. Worker exposure: *Chemical production in closed process without likelihood of exposure or in containment conditions.* (PROC 1)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

**2.3.2. Worker exposure: *Chemical production in closed continuous process with occasional controlled exposure.* (PROC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.3. Worker exposure: *Formulation in closed batch processes with occasional controlled exposure.* (PROC 3)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**2.3.4. Worker exposure: *Chemical production where opportunity for exposure arises* (PROC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.5. Worker exposure: Mixing or blending in batch processes (PROC 5)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.6. Worker exposure: *Transfer of a substance or mixture during process sampling at dedicated facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**2.3.7. Worker exposure: *Transfer of a substance or mixture during process sampling at non-dedicated facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.8. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.9. Worker exposure: Use as laboratory reagent (PROC 15, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.10. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**2.3.11. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non dedicated-facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.12. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated-facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**2.3.13. Worker exposure: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.14. Worker exposure: Manual maintenance (cleaning and repair) of machinery (PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.2 |

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

**3. ES 3: Use at industrial sites; Various sectors (SU 1, SU 2a, SU 2b, SU 4, SU 5, SU 6b, SU 8, SU 9, SU 11, SU 12, SU 13, SU 14, SU 15, SU 16, SU 17)**

**3.1. Title section**

ES name: *Use at industrial site (e.g. Industrial Indoor use as Chemical Intermediate and Process aid, Industrial Outdoor use)*

Sector of use: Agriculture, forestry, fishery (SU 1), Mining (without offshore industries) (SU 2a), Offshore industries (SU 2b), Manufacture of food products (SU 4), Manufacture of textiles, leather, fur (SU 5), Manufacture of pulp, paper and paper products (SU 6b), Manufacture of bulk, large scale chemicals (including petroleum products) (SU 8), Manufacture of fine chemicals (SU 9), Manufacture of rubber products (SU 11), Manufacture of plastics products, including compounding and conversion (SU 12), Manufacture of other non-metallic mineral products, e.g. plasters, cement (SU 13), Manufacture of basic metals, including alloys (SU 14), Manufacture of fabricated metal products, except machinery and equipment (SU 15), Manufacture of computer, electronic and optical products, electrical equipment (SU 16), General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment. (SU 17)

|  |  |
| --- | --- |
| **Environment** |  |
| 1: Use as an intermediate | ERC 6a |
| 2: Use of non-reactive processing aid at industrial site (no inclusion into or onto article) | ERC 4 |
| **Worker** |  |
| 3: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* | PROC 1 |
| 4: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* | PROC 2 |
| 5: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* | PROC 3 |
| 6: Chemical production where opportunity for exposure arises | PROC 4 |
| 7: Mixing or blending in batch processes | PROC 5 |
| 8: Calendering operations | PROC 6 |
| 9: Indoor use; Industrial spraying; Solid in solution | PROC 7 |
| 10: Outdoor use; Industrial spraying | PROC 7 |
| 11: Outdoor use; Industrial spraying | PROC 7 |
| 12: *Transfer of a substance or mixture during process sampling at non-dedicated facilities with a local exhaust ventilation* | PROC 8a, PROC 26 |
| 13: *Transfer of a substance or mixture during process sampling at non-dedicated facilities without a local exhaust ventilation* | PROC 8a, PROC 26 |
| 14: *Transfer of a substance or mixture during process sampling at dedicated facilities with a local exhaust ventilation* | PROC 8b, PROC 26 |
| 15: *Transfer of a substance or mixture during process sampling at dedicated facilities without a local exhaust ventilation* | PROC 8b, PROC 26 |
| 16: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities with a local exhaust ventilation.* | PROC 8a, PROC 26 |
| 17: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities without a local exhaust ventilation.* | PROC 8a, PROC 26 |
| 18: *Transfer of substance or mixture (charging/discharging) at dedicated facilities with a local exhaust ventilation.* | PROC 8b, PROC 26 |
| 19: *Transfer of substance or mixture (charging/discharging) at dedicated facilities without a local exhaust ventilation.* | PROC 8b, PROC 26 |
| 20: *Equipment cleaning and maintenance at non-dedicated facility* | PROC 8a, PROC 28 |
| 21: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities with a local exhaust ventilation* | PROC 9, PROC 26, PROC 27b |
| 22: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities without a local exhaust ventilation* | PROC 9, PROC 26 |
| 23: Roller application or brushing | PROC 10 |
| 24: Treatment of articles by dipping and pouring | PROC 13 |
| 25: Tabletting, compression, extrusion, pelettisation, granulation | PROC 14 |
| 26: Use as laboratory reagent | PROC 15, PROC 26, PROC 27b |
| 27: *Manufacturing and processing of minerals and/or metals at substantially elevated temperature (> melting point - High fugacity)* | PROC 22, PROC 27a |
| 28: *Manufacturing and processing of minerals and/or metals at substantially elevated temperature (>= melting point. Medium fugacity)* | PROC 22, PROC 27a |
| 29: *Open processing and transfer operations at substantially elevated temperature (=< melting point - Medium fugacity)* | PROC 23, PROC 27a |
| 30: *Open processing and transfer operations at substantially elevated temperature (> melting point - High fugacity)* | PROC 23, PROC 27a |
| 31: *Manual maintenance (cleaning and repair) of machinery at noon-dedicated facilities* | PROC 28 |

**3.2. Conditions of use affecting exposure**

**3.2.1. Control of worker exposure**

**Conditions of use applicable to all contributing scenarios**

|  |
| --- |
| **Technical and organisational conditions and measures** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| *Use suitable eye protection.* |
| **Other conditions affecting workers exposure** |
| Assumes process temperature up to 20 °C |

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**Specific conditions of use per contributing scenario**

|  |  |
| --- | --- |
| **Contributing scenario** | **Specific conditions of use** |
| ***Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* (PROC 1)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* (PROC 3)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| **Chemical production where opportunity for exposure arises (PROC 4)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| **Mixing or blending in batch processes (PROC 5)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS.  Outdoor use |
| **Calendering operations (PROC 6)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.*  Indoor use |
| **Indoor use; Industrial spraying; Solid in solution (PROC 7)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 2 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Covers exposure in the presence of local exhaust ventilation of minimum 95% efficiency or respiratory protection with minimum 90% efficiency (e.g. APF of10)*  *covers spraying with moderate application rate (0.3-3 L/minute)*  *Covers spraying direction only horizontal or downward*  Indoor use |
| **Outdoor use; Industrial spraying (PROC 7)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 0.25 h/day  *Covers activity where the primary emission source is located in the breathing zone of the worker (i.e. the volume of air within 1 metre in any direction of the worker’s head)*  *covers any spraying direction*  *covers spraying with high compressed air*  *covers high spraying application rate (> 3 L/minute)*  *Covers spraying activity wearing respiratory protection with minimum efficiency of 95% (i.e. APF of 20)*  Outdoor use |
| **Outdoor use; Industrial spraying (PROC 7)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 2 h/day  *Covers activity where the primary emission source is located out the breathing zone of the worker (i.e. the volume of air is more than 1 metre in any direction of the worker’s head)*  *Covers spraying direction only horizontal or downward*  *covers spraying with high compressed air*  *covers high spraying application rate (> 3 L/minute)*  Outdoor use  *covers partial personal enclosure (e.g. truck cabin)* |
| ***Transfer of a substance or mixture during process sampling at non-dedicated facilities with a local exhaust ventilation* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 1 h/day  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Transfer of a substance or mixture during process sampling at non-dedicated facilities without a local exhaust ventilation* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 1 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.*  Indoor use |
| ***Transfer of a substance or mixture during process sampling at dedicated facilities with a local exhaust ventilation* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Local exhaust ventilation; Inhalation - minimum efficiency of 95 %  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Transfer of a substance or mixture during process sampling at dedicated facilities without a local exhaust ventilation* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Transfer of substance or mixture (charging/discharging) at non-dedicated facilities with a local exhaust ventilation.* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| ***Transfer of substance or mixture (charging/discharging) at non-dedicated facilities without a local exhaust ventilation.* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.*  Indoor or outdoor use |
| ***Transfer of substance or mixture (charging/discharging) at dedicated facilities with a local exhaust ventilation.* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 95 %  Indoor use |
| ***Transfer of substance or mixture (charging/discharging) at dedicated facilities without a local exhaust ventilation.* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Indoor or outdoor use |
| ***Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  Indoor use |
| ***Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities with a local exhaust ventilation* (PROC 9, PROC 26, PROC 27b)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| ***Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities without a local exhaust ventilation* (PROC 9, PROC 26)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.*  Indoor or outdoor use |
| **Roller application or brushing (PROC 10)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.*  Indoor use |
| **Treatment of articles by dipping and pouring (PROC 13)** | Solid, medium dustiness  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| **Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| **Use as laboratory reagent (PROC 15, PROC 26, PROC 27b)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Manufacturing and processing of minerals and/or metals at substantially elevated temperature (> melting point - High fugacity)* (PROC 22, PROC 27a)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| ***Manufacturing and processing of minerals and/or metals at substantially elevated temperature (>= melting point. Medium fugacity)* (PROC 22, PROC 27a)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| ***Open processing and transfer operations at substantially elevated temperature (=< melting point - Medium fugacity)* (PROC 23, PROC 27a)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Indoor use |
| ***Open processing and transfer operations at substantially elevated temperature (> melting point - High fugacity)* (PROC 23, PROC 27a)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a good standard of controlled ventilation (5 to 10 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Indoor use |
| ***Manual maintenance (cleaning and repair) of machinery at noon-dedicated facilities* (PROC 28)** | Covers concentrations up to 100 %  *Solid, medium dustiness. Covers also liquid form*  Covers use up to 8 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of %  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  Indoor use |

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

**3.3.1. Worker exposure: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* (PROC 1)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

**3.3.2. Worker exposure: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.3. Worker exposure: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* (PROC 3)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.4. Worker exposure: Chemical production where opportunity for exposure arises (PROC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.5. Worker exposure: Mixing or blending in batch processes (PROC 5)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.6. Worker exposure: Calendering operations (PROC 6)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.7. Worker exposure: Indoor use; Industrial spraying; Solid in solution (PROC 7)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**3.3.8. Worker exposure: Outdoor use; Industrial spraying (PROC 7)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**3.3.9. Worker exposure: Outdoor use; Industrial spraying (PROC 7)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**3.3.10. Worker exposure: *Transfer of a substance or mixture during process sampling at non-dedicated facilities with a local exhaust ventilation* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.11. Worker exposure: *Transfer of a substance or mixture during process sampling at non-dedicated facilities without a local exhaust ventilation* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.12. Worker exposure: *Transfer of a substance or mixture during process sampling at dedicated facilities with a local exhaust ventilation* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.05 mg/m³ (TRA Workers 3.0) | 0.01 |
| Inhalation, local, acute | 0.2 mg/m³ (TRA Workers 3.0) | 0.02 |

**3.3.13. Worker exposure: *Transfer of a substance or mixture during process sampling at dedicated facilities without a local exhaust ventilation* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.14. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities with a local exhaust ventilation.* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.15. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities without a local exhaust ventilation.* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.16. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated facilities with a local exhaust ventilation.* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.035 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.14 mg/m³ (TRA Workers 3.0) | 0.014 |

**3.3.17. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated facilities without a local exhaust ventilation.* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**3.3.18. Worker exposure: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.19. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities with a local exhaust ventilation* (PROC 9, PROC 26, PROC 27b)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.20. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing) at facilities without a local exhaust ventilation* (PROC 9, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.21. Worker exposure: Roller application or brushing (PROC 10)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.22. Worker exposure: Treatment of articles by dipping and pouring (PROC 13)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.23. Worker exposure: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.24. Worker exposure: Use as laboratory reagent (PROC 15, PROC 26, PROC 27b)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.25. Worker exposure: *Manufacturing and processing of minerals and/or metals at substantially elevated temperature (> melting point - High fugacity)* (PROC 22, PROC 27a)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, local, acute | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

**3.3.26. Worker exposure: *Manufacturing and processing of minerals and/or metals at substantially elevated temperature (>= melting point. Medium fugacity)* (PROC 22, PROC 27a)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, local, acute | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

**3.3.27. Worker exposure: *Open processing and transfer operations at substantially elevated temperature (=< melting point - Medium fugacity)* (PROC 23, PROC 27a)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.28. Worker exposure: *Open processing and transfer operations at substantially elevated temperature (> melting point - High fugacity)* (PROC 23, PROC 27a)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.03 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.12 mg/m³ (TRA Workers 3.0) | 0.012 |

**3.3.29. Worker exposure: *Manual maintenance (cleaning and repair) of machinery at noon-dedicated facilities* (PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.5 mg/m³ (ECETOC TRA Workers) | 0.1 |
| Inhalation, local, acute | 2 mg/m³ (ECETOC TRA Workers) | 0.2 |

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

Scaling tool: For the evaluation of spraying activities the ART (Advanced Reach Tool) modeling tool has been used. In case the DU cannot demonstrate safe use with the conditions currently presented in this SDS Annex, the ART modeling Tool can be used as scaling tool.

**4. ES 4: Widespread use by professional workers; Various sectors (SU 0, SU 1, SU 13, SU 19, SU 20)**

**4.1. Title section**

ES name: Professional use; Indoor use

Sector of use: Other (SU 0), Agriculture, forestry, fishery (SU 1), Manufacture of other non-metallic mineral products, e.g. plasters, cement (SU 13), Building and construction work (SU 19), Health services (SU 20)

|  |  |
| --- | --- |
| **Environment** |  |
| 1: Indoor use; Professional use | ERC 8a |
| **Worker** |  |
| 2: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* | PROC 1 |
| 3: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* | PROC 2 |
| 4: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* | PROC 3 |
| 5: Chemical production where opportunity for exposure arises | PROC 4 |
| 6: Mixing or blending in batch processes | PROC 5 |
| 7: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* | PROC 8a, PROC 26 |
| 8: *Transfer of substance or mixture (charging/discharging) at dedicated facilities* | PROC 8b, PROC 26 |
| 9: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* | PROC 9, PROC 26 |
| 10: Roller application or brushing | PROC 10 |
| 11: Indoor use; Non-industrial spraying; Solid in solution | PROC 11 |
| 12: Use as laboratory reagent | PROC 15, PROC 26 |
| 13: Manual activities involving hand contact | PROC 19 |
| 14: Use of functional fluids in small devices | PROC 20 |
| 15: *Equipment cleaning and maintenance at non-dedicated facility* | PROC 8a, PROC 28 |
| 16: *Manual maintenance (cleaning and repair) of machinery at non-dedicated facility* | PROC 28 |

**4.2. Conditions of use affecting exposure**

**4.2.1. Control of worker exposure**

**Conditions of use applicable to all contributing scenarios**

|  |
| --- |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| *Use suitable eye protection.* |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 20 °C |

​

**Specific conditions of use per contributing scenario**

|  |  |
| --- | --- |
| **Contributing scenario** | **Specific conditions of use** |
| ***Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* (PROC 1)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* (PROC 3)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Chemical production where opportunity for exposure arises (PROC 4)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Mixing or blending in batch processes (PROC 5)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Transfer of substance or mixture (charging/discharging) at dedicated facilities* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Roller application or brushing (PROC 10)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 90 %  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Indoor use; Non-industrial spraying; Solid in solution (PROC 11)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 2 h/day  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  *Covers exposure in the presence of local exhaust ventilation of minimum 95% efficiency or respiratory protection with minimum 90% efficiency (e.g. APF of10)*  *covers spraying with moderate application rate (0.3-3 L/minute)*  *Covers spraying direction only horizontal or downward*  Wear suitable gloves tested to EN374.; 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.; For further specification, refer to section 8 of the SDS. |
| **Use as laboratory reagent (PROC 15, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Manual activities involving hand contact (PROC 19)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of 80 %  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| **Use of functional fluids in small devices (PROC 20)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |
| ***Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Respiratory protection (APF of 10) is to be worn in those case where there is potential for peak exposure. Alternatively, good general ventilation with a minimum of 5-10 air changes per air can be applied.* |
| ***Manual maintenance (cleaning and repair) of machinery at non-dedicated facility* (PROC 28)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Provide a basic standard of general ventilation (1 to 3 air changes per hour).  Local exhaust ventilation; Inhalation - minimum efficiency of %  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS. |

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

**4.3.1. Worker exposure: *Chemical production in closed process without likelihood of exposure or in containment conditions or processes with equivalent containment conditions* (PROC 1)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

**4.3.2. Worker exposure: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**4.3.3. Worker exposure: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment condition* (PROC 3)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.4. Worker exposure: Chemical production where opportunity for exposure arises (PROC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.5. Worker exposure: Mixing or blending in batch processes (PROC 5)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.6. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.4 mg/m³ (TRA Workers 3.0) | 0.28 |
| Inhalation, local, acute | 5.6 mg/m³ (TRA Workers 3.0) | 0.56 |

**4.3.7. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.8. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.9. Worker exposure: Roller application or brushing (PROC 10)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.10. Worker exposure: Indoor use; Non-industrial spraying; Solid in solution (PROC 11)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**4.3.11. Worker exposure: Use as laboratory reagent (PROC 15, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.12. Worker exposure: Manual activities involving hand contact (PROC 19)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.13. Worker exposure: Use of functional fluids in small devices (PROC 20)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, local, acute | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**4.3.14. Worker exposure: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a, PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.15. Worker exposure: *Manual maintenance (cleaning and repair) of machinery at non-dedicated facility* (PROC 28)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (ECETOC TRA Workers) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (ECETOC TRA Workers) | 0.28 |

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

Scaling tool: For the evaluation of spraying activities the ART (Advanced Reach Tool) modeling tool has been used. In case the DU cannot demonstrate safe use with the conditions currently presented in this SDS Annex, the ART modeling Tool can be used as scaling tool.

**5. ES 5: Widespread use by professional workers; Various sectors (SU 0, SU 1, SU 5, SU 13, SU 19, SU 20)**

**5.1. Title section**

ES name: Professional use; Outdoor use

Sector of use: Other (SU 0), Agriculture, forestry, fishery (SU 1), Manufacture of textiles, leather, fur (SU 5), Manufacture of other non-metallic mineral products, e.g. plasters, cement (SU 13), Building and construction work (SU 19), Health services (SU 20)

|  |  |
| --- | --- |
| **Environment** |  |
| 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) | ERC 8d |
| **Worker** |  |
| 2: *Chemical production in closed process without likelihood of exposure or in containment conditions.* | PROC 1 |
| 3: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* | PROC 2 |
| 4: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions* | PROC 3 |
| 5: Chemical production where opportunity for exposure arises | PROC 4 |
| 6: Mixing or blending in batch processes | PROC 5 |
| 7: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* | PROC 8a, PROC 26 |
| 8: *Transfer of substance or mixture (charging/discharging) at dedicated facilities* | PROC 8b, PROC 26 |
| 9: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* | PROC 9, PROC 26 |
| 10: Roller application or brushing | PROC 10 |
| 11: Outdoor use; Non-industrial spraying | PROC 11 |
| 12: Outdoor use; Non-industrial spraying | PROC 11 |
| 13: Use as laboratory reagent | PROC 15, PROC 26 |
| 14: Mixing operations; Manual activities involving hand contact | PROC 19 |
| 15: *Equipment cleaning and maintenance at non-dedicated facility* | PROC 8a |
| 16: Use of functional fluids in small devices | PROC 20 |

**5.2. Conditions of use affecting exposure**

**5.2.1. Control of worker exposure**

**Conditions of use applicable to all contributing scenarios**

|  |
| --- |
| **Other conditions affecting workers exposure** |
| Outdoor use |
| Assumes process temperature up to 20 °C |

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**Specific conditions of use per contributing scenario**

|  |  |
| --- | --- |
| **Contributing scenario** | **Specific conditions of use** |
| ***Chemical production in closed process without likelihood of exposure or in containment conditions.* (PROC 1)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| ***Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| ***Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions* (PROC 3)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| **Chemical production where opportunity for exposure arises (PROC 4)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS.  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| **Mixing or blending in batch processes (PROC 5)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| ***Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* (PROC 8a, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| ***Transfer of substance or mixture (charging/discharging) at dedicated facilities* (PROC 8b, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| ***Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  *Use suitable eye protection*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| **Roller application or brushing (PROC 10)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| **Outdoor use; Non-industrial spraying (PROC 11)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 2 h/day  *Covers activity where the primary emission source is located out the breathing zone of the worker (i.e. the volume of air is more than 1 metre in any direction of the worker’s head)*  Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  *Covers spraying direction only horizontal or downward*  *covers spraying with high compressed air*  *covers high spraying application rate (> 3 L/minute)*  *Use suitable eye protection.*  Wear suitable gloves tested to EN374.; 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.; For further specification, refer to section 8 of the SDS.  *covers partial personal enclosure (e.g. truck cabin)* |
| **Outdoor use; Non-industrial spraying (PROC 11)** | Covers concentrations up to 35 %  *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.*  Covers use up to 0.25 h/day  *Covers activity where the primary emission source is located in the breathing zone of the worker (i.e. the volume of air within 1 metre in any direction of the worker’s head)*  Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.  *covers any spraying direction*  *covers spraying with high compressed air*  *covers high spraying application rate (> 3 L/minute)*  *Use suitable eye protection.*  *Covers spraying activity wearing respiratory protection with minimum efficiency of 95% (i.e. APF of 20)*  Wear suitable gloves tested to EN374.; 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.; For further specification, refer to section 8 of the SDS. |
| **Use as laboratory reagent (PROC 15, PROC 26)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |
| **Mixing operations; Manual activities involving hand contact (PROC 19)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| ***Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  *Handle substance within a closed system [ES47] Drain down and flush system prior to equipment break-in or maintenance [E55] Transfer via enclosed lines [E52]*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection*  Wear suitable respiratory protection.; Inhalation - minimum efficiency of 90 %; For further specification, refer to section 8 of the SDS. |
| **Use of functional fluids in small devices (PROC 20)** | Covers concentrations up to 100 %  Solid, medium dustiness  Covers use up to 8 h/day  *Assumes a good basic standard of occupational hygiene is implemented*  Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.; 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.; For further specification, refer to section 8 of the SDS.  *Use suitable eye protection* |

**5.3. Exposure estimation and reference to its source**

**5.3.1. Worker exposure: *Chemical production in closed process without likelihood of exposure or in containment conditions.* (PROC 1)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 7E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, local, acute | 0.028 mg/m³ (TRA Workers 3.0) | < 0.01 |

**5.3.2. Worker exposure: *Chemical production in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions* (PROC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.3. Worker exposure: *Manufacture or formulation in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions* (PROC 3)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.4. Worker exposure: Chemical production where opportunity for exposure arises (PROC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.5. Worker exposure: Mixing or blending in batch processes (PROC 5)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.6. Worker exposure: *Transfer of substance or mixture (charging/discharging) at non-dedicated facilities* (PROC 8a, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.7. Worker exposure: *Transfer of substance or mixture (charging/discharging) at dedicated facilities* (PROC 8b, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.8. Worker exposure: *Transfer of substance or mixture into small containers (dedicated filling line, including weighing)* (PROC 9, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.9. Worker exposure: Roller application or brushing (PROC 10)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.10. Worker exposure: Outdoor use; Non-industrial spraying (PROC 11)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**5.3.11. Worker exposure: Outdoor use; Non-industrial spraying (PROC 11)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, local, acute | 9.6 mg/m³ (ART) | 0.96 |

**5.3.12. Worker exposure: Use as laboratory reagent (PROC 15, PROC 26)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.13. Worker exposure: Mixing operations; Manual activities involving hand contact (PROC 19)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, local, acute | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.14. Worker exposure: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.15. Worker exposure: Use of functional fluids in small devices (PROC 20)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, local, acute | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

Guidance: Application of de-icing agent (mixture of 70% NaCl and 30% of a 20% solution of CaCl2) assumes a fraction of 0.06 of CaCl2 in road salt with an annual tonnage of 0.09 tonnes/km for 25 emission days per year. Application of de-icing agent (liquid CaCl2 brine (max. 35% solution)) assumes a fraction of 0.35 of CaCl2 in road salt with an annual tonnage of 0.28 tonnes/km for 25 emission days per year. Application of Dust suppressor (solid CaCl2 (up to 80%)) assumes a fraction of 0.8 of CaCl2 in road salt with an annual tonnage of 2.4 tonnes/km for 3 emission days per year. Application of Dust suppressor (solid CaCl2 (up to 37%)) assumes a fraction of 0.37 of CaCl2 in road salt with an annual tonnage of 1.11 tonnes/km for 3 emission days per year.

**6. ES 6: Consumer use; Various products (PC 0, PC 2, PC 4, PC 12, PC 16, PC 27, PC 35, PC 37)**

**6.1. Title section**

ES name: Consumer use; Indoor or outdoor use

Product category: Other (PC 0), Adsorbents (PC 2), Anti-Freeze and De-icing products (PC 4), Fertilizers (PC 12), Heat Transfer Fluids (PC 16), Plant Protection Products (PC 27), Washing and Cleaning Products (PC 35), Water treatment chemicals (PC 37)

|  |  |
| --- | --- |
| **Environment** |  |
| 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) | ERC 8a |
| 2: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) | ERC 8d |
| **Consumer** |  |
| 3: Dust suppressant; No spraying | PC 0 |
| 4: Dust suppressant; Spraying | PC 0 |
| 5: *Humidity adsorbants* | PC 0 |
| 6: *Cement/concrete/mortar* | PC 0 |
| 7: Adsorbents | PC 2 |
| 8: Anti-freeze and de-icing products; No spraying | PC 4 |
| 9: Anti-freeze and de-icing products; Spraying | PC 4 |
| 10: Fertilizers; No spraying | PC 12 |
| 11: Fertilizers; Spraying | PC 12 |
| 12: Heat transfer fluids | PC 16 |
| 13: Plant protection products; No spraying | PC 27 |
| 14: Plant protection products; Spraying | PC 27 |
| 15: Water treatment chemicals | PC 37 |
| 16: Washing and cleaning products; No spraying | PC 35 |
| 17: Washing and cleaning products; Spraying | PC 35 |

**6.2. Conditions of use affecting exposure**

**6.2.1. Control of consumer exposure: Dust suppressant; No spraying (PC 0)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.2. Control of consumer exposure: Dust suppressant; Spraying (PC 0)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 45 % |
| *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.* |
| *Covers spraying activity* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.3. Control of consumer exposure: *Humidity adsorbants* (PC 0)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.4. Control of consumer exposure: *Cement/concrete/mortar* (PC 0)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.5. Control of consumer exposure: Adsorbents (PC 2)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.6. Control of consumer exposure: Anti-freeze and de-icing products; No spraying (PC 4)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| For each use event, covers use amounts up to 5E4 g/event |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.7. Control of consumer exposure: Anti-freeze and de-icing products; Spraying (PC 4)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 45 % |
| *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.* |
| *Covers spraying activity* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.8. Control of consumer exposure: Fertilizers; No spraying (PC 12)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.9. Control of consumer exposure: Fertilizers; Spraying (PC 12)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 45 % |
| *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.* |
| *Covers spraying activity* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.10. Control of consumer exposure: Heat transfer fluids (PC 16)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.11. Control of consumer exposure: Plant protection products; No spraying (PC 27)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.12. Control of consumer exposure: Plant protection products; Spraying (PC 27)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 45 % |
| *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.* |
| *Covers spraying activity* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.13. Control of consumer exposure: Water treatment chemicals (PC 37)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| *Covers exposure via inhalation route* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.14. Control of consumer exposure: Washing and cleaning products; No spraying (PC 35)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Other conditions affecting consumers exposure** |
| Release area <= 125 m2 |

**6.2.15. Control of consumer exposure: Washing and cleaning products; Spraying (PC 35)**

|  |
| --- |
| **Product (article) characteristics** |
| Covers concentrations up to 45 % |
| *Physical form of the product is assumed as liquid, this is conservative as it is a solid in a liquid with a very low vapour pressure.* |
| *Covers spraying activity* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Information and behavioral advice for consumers** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

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

**6.3.1. Consumer exposure: Dust suppressant; No spraying (PC 0)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.2. Consumer exposure: Dust suppressant; Spraying (PC 0)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, local, acute | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.3. Consumer exposure: *Humidity adsorbants* (PC 0)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.4. Consumer exposure: *Cement/concrete/mortar* (PC 0)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.5. Consumer exposure: Adsorbents (PC 2)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.6. Consumer exposure: Anti-freeze and de-icing products; No spraying (PC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.7. Consumer exposure: Anti-freeze and de-icing products; Spraying (PC 4)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, local, acute | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.8. Consumer exposure: Fertilizers; No spraying (PC 12)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.9. Consumer exposure: Fertilizers; Spraying (PC 12)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, local, acute | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.10. Consumer exposure: Heat transfer fluids (PC 16)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.11. Consumer exposure: Plant protection products; No spraying (PC 27)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.12. Consumer exposure: Plant protection products; Spraying (PC 27)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, local, acute | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.13. Consumer exposure: Water treatment chemicals (PC 37)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.14. Consumer exposure: Washing and cleaning products; No spraying (PC 35)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, local, acute | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.15. Consumer exposure: Washing and cleaning products; Spraying (PC 35)**

| **Route of exposure and type of effects** | **Exposure estimate** | **RCR** |
| --- | --- | --- |
| Inhalation, local, long term | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, local, acute | 0.69 mg/m³ (ConsExpo) | 0.138 |

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