**CENÁRIO DE EXPOSIÇÃO PARA COMUNICAÇÃO**

**Nome da substância:** calcium chloride

**número CE:** 233-140-8

**Número CAS:** 10043-52-4

**Número de Registo:**

**Data de produção/revisão:** 16/04/2020

**Autor:** Apeiron-Team NV

**Índice**

[1. ES 1: Fabrico](#N10033) [3](#N10033)

[2. ES 2: Formulação ou reembalagem](#N10449) [6](#N10449)

[3. ES 3: Utilização em instalações industriais; Vários setores (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)](#N1097D) [11](#N1097D)

[4. ES 4: Utilização generalizada por trabalhadores profissionais; Vários setores (SU 0, SU 1, SU 13, SU 19, SU 20)](#N11497) [21](#N11497)

[5. ES 5: Utilização generalizada por trabalhadores profissionais; Vários setores (SU 0, SU 1, SU 5, SU 13, SU 19, SU 20)](#N11A79) [28](#N11A79)

[6. ES 6: Utilização pelos consumidores; Vários produtos (PC 0, PC 2, PC 4, PC 12, PC 16, PC 27, PC 35, PC 37)](#N120A3) [35](#N120A3)

**Capítulo 1. ES 1: Fabrico**

**1.1. Secção do título**

DesignaçãoES: Manufacture

|  |  |
| --- | --- |
| **Ambiente** |  |
| 1: *Manufacturing of substances* | ERC 1 |
| **Trabalhador** |  |
| 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. Condições de utilização que afetem a exposição**

**1.2.1. Controlo da exposição dos trabalhadores**

**Condições de utilização aplicáveis a todos os cenários contributivos**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada (ou contida em artigos), frequência e duração da utilização/exposição** |
| Covers use up to 8 h/day |
| **Condições e medidas técnicas e organizacionais** |
| 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. |
| **Condições e medidas relacionadas com a proteção individual, a higiene e a avaliação da saúde** |
| 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. |
| **Outras condições que afetem a exposição dos trabalhadores** |
| Indoor use |
| Assumes process temperature up to 20 °C |

**1.3. Estimativa da exposição e referência à sua fonte**

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.774 mg/m³ (Dados medidos) | 0.355 |
| Por inalação, local, agudo | 1.774 mg/m³ (Dados medidos) | 0.177 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.774 mg/m³ (Dados medidos) | 0.355 |
| Por inalação, local, agudo | 1.774 mg/m³ (Dados medidos) | 0.177 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.774 mg/m³ (Dados medidos) | 0.355 |
| Por inalação, local, agudo | 1.774 mg/m³ (Dados medidos) | 0.177 |

**1.3.4. Exposição do trabalhador: Chemical production where opportunity for exposure arises (PROC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.881 mg/m³ (Dados medidos) | 0.376 |
| Por inalação, local, agudo | 1.881 mg/m³ (Dados medidos) | 0.188 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

**1.3.8. Exposição do trabalhador: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

**1.3.9. Exposição do trabalhador: Use as laboratory reagent (PROC 15, PROC 26)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.774 mg/m³ (Dados medidos) | 0.355 |
| Por inalação, local, agudo | 1.774 mg/m³ (Dados medidos) | 0.177 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

**1.3.13. Exposição do trabalhador: Handling of solid inorganic substances at ambient temperature (PROC 26)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 2.742 mg/m³ (Dados medidos) | 0.548 |
| Por inalação, local, agudo | 2.742 mg/m³ (Dados medidos) | 0.274 |

**1.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**

**Capítulo 2. ES 2: Formulação ou reembalagem**

**2.1. Secção do título**

DesignaçãoES: Formulation or re-packing; Distribution of substance

|  |  |
| --- | --- |
| **Ambiente** |  |
| 1: Formulation into mixture | ERC 2 |
| **Trabalhador** |  |
| 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. Condições de utilização que afetem a exposição**

**2.2.1. Controlo da exposição dos trabalhadores**

**Condições de utilização aplicáveis a todos os cenários contributivos**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Condições e medidas técnicas e organizacionais** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Condições e medidas relacionadas com a proteção individual, a higiene e a avaliação da saúde** |
| 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.* |
| **Outras condições que afetem a exposição dos trabalhadores** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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**Condições específicas de utilização por cenários contributivo**

|  |  |
| --- | --- |
| **Cenáriocontribuinte** | **Medidas específicas** |
| ***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. Estimativa da exposição e referência à sua fonte**

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**2.3.4. Exposição do trabalhador: *Chemical production where opportunity for exposure arises* (PROC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.5. Exposição do trabalhador: Mixing or blending in batch processes (PROC 5)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.9. Exposição do trabalhador: Use as laboratory reagent (PROC 15, PROC 26)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.10. Exposição do trabalhador: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.14. Exposição do trabalhador: Manual maintenance (cleaning and repair) of machinery (PROC 28)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.2 |

**2.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**

**Capítulo 3. ES 3: Utilização em instalações industriais; Vários setores (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. Secção do título**

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

Setor de utilização: Agricultura, silvicultura, pescas (SU 1), Indústrias extractivas (sem incluir as indústrias offshore) (SU 2a), Indústrias offshore (SU 2b), Indústrias alimentares (SU 4), Fabrico de têxteis, artigos de couro e peles (SU 5), Fabrico de pasta, de papel e cartão e seus artigos (SU 6b), Fabrico de produtos químicos a granel em grande escala (incluindo produtos petrolíferos) (SU 8), Fabrico de produtos químicos finos (SU 9), Fabrico de artigos de borracha (SU 11), Fabrico de produtos de plástico, incluindo a operação de mistura e transformação (SU 12), Fabrico de outros produtos minerais não metálicos, por exemplo gesso, cimento (SU 13), Indústrias metalúrgicas de base, incluindo ligas (SU 14), Fabrico de produtos metálicos, excepto máquinas e equipamentos (SU 15), Fabrico de equipamentos informáticos, produtos ópticos e electrónicos e equipamentos eléctricos (SU 16), Operações de fabricação não especificadas, por exemplo, de máquinas, equipamentos, veículos ou outros equipamentos de transporte (SU 17)

|  |  |
| --- | --- |
| **Ambiente** |  |
| 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 |
| **Trabalhador** |  |
| 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. Condições de utilização que afetem a exposição**

**3.2.1. Controlo da exposição dos trabalhadores**

**Condições de utilização aplicáveis a todos os cenários contributivos**

|  |
| --- |
| **Condições e medidas técnicas e organizacionais** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Condições e medidas relacionadas com a proteção individual, a higiene e a avaliação da saúde** |
| 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.* |
| **Outras condições que afetem a exposição dos trabalhadores** |
| Assumes process temperature up to 20 °C |

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**Condições específicas de utilização por cenários contributivo**

|  |  |
| --- | --- |
| **Cenáriocontribuinte** | **Medidas específicas** |
| ***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. Estimativa da exposição e referência à sua fonte**

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.4. Exposição do trabalhador: Chemical production where opportunity for exposure arises (PROC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.5. Exposição do trabalhador: Mixing or blending in batch processes (PROC 5)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.6. Exposição do trabalhador: Calendering operations (PROC 6)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.7. Exposição do trabalhador: Indoor use; Industrial spraying; Solid in solution (PROC 7)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

**3.3.8. Exposição do trabalhador: Outdoor use; Industrial spraying (PROC 7)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

**3.3.9. Exposição do trabalhador: Outdoor use; Industrial spraying (PROC 7)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.05 mg/m³ (TRA Workers 3.0) | 0.01 |
| Por inalação, local, agudo | 0.2 mg/m³ (TRA Workers 3.0) | 0.02 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.035 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.14 mg/m³ (TRA Workers 3.0) | 0.014 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.19. Exposição do trabalhador: *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)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.21. Exposição do trabalhador: Roller application or brushing (PROC 10)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.22. Exposição do trabalhador: Treatment of articles by dipping and pouring (PROC 13)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.23. Exposição do trabalhador: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.24. Exposição do trabalhador: Use as laboratory reagent (PROC 15, PROC 26, PROC 27b)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Por inalação, local, agudo | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Por inalação, local, agudo | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.03 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.12 mg/m³ (TRA Workers 3.0) | 0.012 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.5 mg/m³ (ECETOC TRA Workers) | 0.1 |
| Por inalação, local, agudo | 2 mg/m³ (ECETOC TRA Workers) | 0.2 |

**3.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**

Ferramenta de extrapolação: 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.

**Capítulo 4. ES 4: Utilização generalizada por trabalhadores profissionais; Vários setores (SU 0, SU 1, SU 13, SU 19, SU 20)**

**4.1. Secção do título**

DesignaçãoES: Professional use; Indoor use

Setor de utilização: Outros (SU 0), Agricultura, silvicultura, pescas (SU 1), Fabrico de outros produtos minerais não metálicos, por exemplo gesso, cimento (SU 13), Indústria da construção (SU 19), Serviços de saúde (SU 20)

|  |  |
| --- | --- |
| **Ambiente** |  |
| 1: Indoor use; Professional use | ERC 8a |
| **Trabalhador** |  |
| 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. Condições de utilização que afetem a exposição**

**4.2.1. Controlo da exposição dos trabalhadores**

**Condições de utilização aplicáveis a todos os cenários contributivos**

|  |
| --- |
| **Condições e medidas relacionadas com a proteção individual, a higiene e a avaliação da saúde** |
| *Use suitable eye protection.* |
| **Outras condições que afetem a exposição dos trabalhadores** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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**Condições específicas de utilização por cenários contributivo**

|  |  |
| --- | --- |
| **Cenáriocontribuinte** | **Medidas específicas** |
| ***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. Estimativa da exposição e referência à sua fonte**

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.4. Exposição do trabalhador: Chemical production where opportunity for exposure arises (PROC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.5. Exposição do trabalhador: Mixing or blending in batch processes (PROC 5)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.4 mg/m³ (TRA Workers 3.0) | 0.28 |
| Por inalação, local, agudo | 5.6 mg/m³ (TRA Workers 3.0) | 0.56 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.9. Exposição do trabalhador: Roller application or brushing (PROC 10)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.10. Exposição do trabalhador: Indoor use; Non-industrial spraying; Solid in solution (PROC 11)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

**4.3.11. Exposição do trabalhador: Use as laboratory reagent (PROC 15, PROC 26)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.12. Exposição do trabalhador: Manual activities involving hand contact (PROC 19)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.13. Exposição do trabalhador: Use of functional fluids in small devices (PROC 20)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Por inalação, local, agudo | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (ECETOC TRA Workers) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (ECETOC TRA Workers) | 0.28 |

**4.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**

Ferramenta de extrapolação: 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.

**Capítulo 5. ES 5: Utilização generalizada por trabalhadores profissionais; Vários setores (SU 0, SU 1, SU 5, SU 13, SU 19, SU 20)**

**5.1. Secção do título**

DesignaçãoES: Professional use; Outdoor use

Setor de utilização: Outros (SU 0), Agricultura, silvicultura, pescas (SU 1), Fabrico de têxteis, artigos de couro e peles (SU 5), Fabrico de outros produtos minerais não metálicos, por exemplo gesso, cimento (SU 13), Indústria da construção (SU 19), Serviços de saúde (SU 20)

|  |  |
| --- | --- |
| **Ambiente** |  |
| 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) | ERC 8d |
| **Trabalhador** |  |
| 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. Condições de utilização que afetem a exposição**

**5.2.1. Controlo da exposição dos trabalhadores**

**Condições de utilização aplicáveis a todos os cenários contributivos**

|  |
| --- |
| **Outras condições que afetem a exposição dos trabalhadores** |
| Outdoor use |
| Assumes process temperature up to 20 °C |

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**Condições específicas de utilização por cenários contributivo**

|  |  |
| --- | --- |
| **Cenáriocontribuinte** | **Medidas específicas** |
| ***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. Estimativa da exposição e referência à sua fonte**

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 7E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Por inalação, local, agudo | 0.028 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.4. Exposição do trabalhador: Chemical production where opportunity for exposure arises (PROC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.5. Exposição do trabalhador: Mixing or blending in batch processes (PROC 5)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.9. Exposição do trabalhador: Roller application or brushing (PROC 10)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.10. Exposição do trabalhador: Outdoor use; Non-industrial spraying (PROC 11)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

**5.3.11. Exposição do trabalhador: Outdoor use; Non-industrial spraying (PROC 11)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 1.2 mg/m³ (ART) | 0.24 |
| Por inalação, local, agudo | 9.6 mg/m³ (ART) | 0.96 |

**5.3.12. Exposição do trabalhador: Use as laboratory reagent (PROC 15, PROC 26)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.13. Exposição do trabalhador: Mixing operations; Manual activities involving hand contact (PROC 19)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Por inalação, local, agudo | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.14. Exposição do trabalhador: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.15. Exposição do trabalhador: Use of functional fluids in small devices (PROC 20)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Por inalação, local, agudo | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**

Orientação: 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.

**Capítulo 6. ES 6: Utilização pelos consumidores; Vários produtos (PC 0, PC 2, PC 4, PC 12, PC 16, PC 27, PC 35, PC 37)**

**6.1. Secção do título**

DesignaçãoES: Consumer use; Indoor or outdoor use

Categoria de produto: Outros (PC 0), Adsorventes (PC 2), Produtos anticongelantes e de descongelamento (PC 4), Fertilizantes (PC 12), Fluidos para transferência de calor (PC 16), Produtos fitofarmacêuticos (PC 27), Produto de lavagem e de limpeza (PC 35), Produtos químicos para tratamento de águas (PC 37)

|  |  |
| --- | --- |
| **Ambiente** |  |
| 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 |
| **Consumidor** |  |
| 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. Condições de utilização que afetem a exposição**

**6.2.1. Controlo da exposição do consumidor: Dust suppressant; No spraying (PC 0)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.2. Controlo da exposição do consumidor: Dust suppressant; Spraying (PC 0)**

|  |
| --- |
| **Características do produto (artigo)** |
| 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* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.3. Controlo da exposição do consumidor: *Humidity adsorbants* (PC 0)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.4. Controlo da exposição do consumidor: *Cement/concrete/mortar* (PC 0)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.5. Controlo da exposição do consumidor: Adsorbents (PC 2)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.6. Controlo da exposição do consumidor: Anti-freeze and de-icing products; No spraying (PC 4)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| 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* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.7. Controlo da exposição do consumidor: Anti-freeze and de-icing products; Spraying (PC 4)**

|  |
| --- |
| **Características do produto (artigo)** |
| 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* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.8. Controlo da exposição do consumidor: Fertilizers; No spraying (PC 12)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.9. Controlo da exposição do consumidor: Fertilizers; Spraying (PC 12)**

|  |
| --- |
| **Características do produto (artigo)** |
| 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* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.10. Controlo da exposição do consumidor: Heat transfer fluids (PC 16)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.11. Controlo da exposição do consumidor: Plant protection products; No spraying (PC 27)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.12. Controlo da exposição do consumidor: Plant protection products; Spraying (PC 27)**

|  |
| --- |
| **Características do produto (artigo)** |
| 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* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.13. Controlo da exposição do consumidor: Water treatment chemicals (PC 37)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| *Covers exposure via inhalation route* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.14. Controlo da exposição do consumidor: Washing and cleaning products; No spraying (PC 35)**

|  |
| --- |
| **Características do produto (artigo)** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Outras condições que afetem a exposição dos consumidores** |
| Release area <= 125 m2 |

**6.2.15. Controlo da exposição do consumidor: Washing and cleaning products; Spraying (PC 35)**

|  |
| --- |
| **Características do produto (artigo)** |
| 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* |
| **Quantidade utilizada, frequência e duração da utilização/exposição** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informação e recomendações de comportamento para consumidores** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.3. Estimativa da exposição e referência à sua fonte**

**6.3.1. Exposição do consumidor: Dust suppressant; No spraying (PC 0)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.2. Exposição do consumidor: Dust suppressant; Spraying (PC 0)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Por inalação, local, agudo | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.3. Exposição do consumidor: *Humidity adsorbants* (PC 0)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.4. Exposição do consumidor: *Cement/concrete/mortar* (PC 0)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.5. Exposição do consumidor: Adsorbents (PC 2)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.6. Exposição do consumidor: Anti-freeze and de-icing products; No spraying (PC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.7. Exposição do consumidor: Anti-freeze and de-icing products; Spraying (PC 4)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Por inalação, local, agudo | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.8. Exposição do consumidor: Fertilizers; No spraying (PC 12)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.9. Exposição do consumidor: Fertilizers; Spraying (PC 12)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Por inalação, local, agudo | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.10. Exposição do consumidor: Heat transfer fluids (PC 16)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.11. Exposição do consumidor: Plant protection products; No spraying (PC 27)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.12. Exposição do consumidor: Plant protection products; Spraying (PC 27)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Por inalação, local, agudo | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.13. Exposição do consumidor: Water treatment chemicals (PC 37)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.14. Exposição do consumidor: Washing and cleaning products; No spraying (PC 35)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Por inalação, local, agudo | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.15. Exposição do consumidor: Washing and cleaning products; Spraying (PC 35)**

| **Via de exposição e tipo de efeitos** | **Estimativa da exposição** | **QCR** |
| --- | --- | --- |
| Por inalação, local, crónico | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Por inalação, local, agudo | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.4. Orientações para o DU avaliar se trabalha dentro dos limites estabelecidos pelo ES**