**EXPOSITIONSSZENARIUM ZUR KOMMUNIKATION**

**Stoffname:** calcium chloride

**EG-Nummer:** 233-140-8

**CAS-Nummer:** 10043-52-4

**Registrierungsnummer:**

**Ausgabedatum/Überarbeitungsdatum:** 16/04/2020

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**Kapitel 1. ES 1: Herstellung**

**1.1. Titel-Abschnitt**

ES-.ezeichnung: Manufacture

|  |  |
| --- | --- |
| **Umwelt** |  |
| 1: *Manufacturing of substances* | ERC 1 |
| **Arbeitnehmer** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**1.2.1. Kontrolle der Exposition von Arbeitnehmerns**

**Für alle Beitragsszenarien geltende Verwendungsbedingungen**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge (oder in Erzeugnissen enthaltene Menge), Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 8 h/day |
| **Technische und organisatorische Bedingungen und Maßnahmen** |
| 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. |
| **Bedingungen und Maßnahmen im Zusammenhang mit persönlichen Schutzausrüstungen, Hygiene und Gesundheitsbewertung** |
| 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. |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Arbeitnehmern** |
| Indoor use |
| Assumes process temperature up to 20 °C |

**1.3. Expositionsabschätzung und Verweis auf ihren Ursprung**

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.774 mg/m³ (Messdaten) | 0.355 |
| Inhalation, lokal, akut | 1.774 mg/m³ (Messdaten) | 0.177 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.774 mg/m³ (Messdaten) | 0.355 |
| Inhalation, lokal, akut | 1.774 mg/m³ (Messdaten) | 0.177 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.774 mg/m³ (Messdaten) | 0.355 |
| Inhalation, lokal, akut | 1.774 mg/m³ (Messdaten) | 0.177 |

**1.3.4. Exposition des Arbeitnehmers: Chemical production where opportunity for exposure arises (PROC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.881 mg/m³ (Messdaten) | 0.376 |
| Inhalation, lokal, akut | 1.881 mg/m³ (Messdaten) | 0.188 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

**1.3.8. Exposition des Arbeitnehmers: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

**1.3.9. Exposition des Arbeitnehmers: Use as laboratory reagent (PROC 15, PROC 26)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.774 mg/m³ (Messdaten) | 0.355 |
| Inhalation, lokal, akut | 1.774 mg/m³ (Messdaten) | 0.177 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

**1.3.13. Exposition des Arbeitnehmers: Handling of solid inorganic substances at ambient temperature (PROC 26)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 2.742 mg/m³ (Messdaten) | 0.548 |
| Inhalation, lokal, akut | 2.742 mg/m³ (Messdaten) | 0.274 |

**1.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**

**Kapitel 2. ES 2: Formulierung oder Umverpackung**

**2.1. Titel-Abschnitt**

ES-.ezeichnung: Formulation or re-packing; Distribution of substance

|  |  |
| --- | --- |
| **Umwelt** |  |
| 1: Formulation into mixture | ERC 2 |
| **Arbeitnehmer** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**2.2.1. Kontrolle der Exposition von Arbeitnehmerns**

**Für alle Beitragsszenarien geltende Verwendungsbedingungen**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Technische und organisatorische Bedingungen und Maßnahmen** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Bedingungen und Maßnahmen im Zusammenhang mit persönlichen Schutzausrüstungen, Hygiene und Gesundheitsbewertung** |
| 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.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Arbeitnehmern** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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**Pro Beitragsszenarium geltende besondere Verwendungsbedingungen**

|  |  |
| --- | --- |
| **Beitragsszenarium** | **Gezielte Maßnahmen** |
| ***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. Expositionsabschätzung und Verweis auf ihren Ursprung**

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**2.3.4. Exposition des Arbeitnehmers: *Chemical production where opportunity for exposure arises* (PROC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.5. Exposition des Arbeitnehmers: Mixing or blending in batch processes (PROC 5)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**2.3.9. Exposition des Arbeitnehmers: Use as laboratory reagent (PROC 15, PROC 26)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.10. Exposition des Arbeitnehmers: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**2.3.14. Exposition des Arbeitnehmers: Manual maintenance (cleaning and repair) of machinery (PROC 28)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (PROC 8a estimate used to cover PROC 28) | 0.2 |

**2.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**

**Kapitel 3. ES 3: Verwendung an Industriestandorten; Verschiedene Sektoren (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. Titel-Abschnitt**

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

Verwendungssektor: Land- und Forstwirtschaft, Fischerei (SU 1), Bergbau (außer Offshore-Industrien) (SU 2a), Offshore-Industrien (SU 2b), Herstellung von Lebens- und Futtermitteln (SU 4), Herstellung von Textilien, Leder, Pelzen (SU 5), Herstellung von Zellstoff, Papier und Papierprodukten (SU 6b), Herstellung von Massenchemikalien (einschließlich Mineralölprodukte) (SU 8), Herstellung von Feinchemikalien (SU 9), Herstellung von Gummiprodukten (SU 11), Herstellung von Kunststoffprodukten, einschließlich Compoundierung und Konversion (SU 12), Herstellung von sonstigen nichtmetallischen mineralischen Produkten, z. B. Gips, Zement (SU 13), Metallerzeugung und -bearbeitung, einschließlich Legierungen (SU 14), Herstellung von Metallerzeugnissen, außer Maschinen und Ausrüstungen (SU 15), Herstellung von Computern, elektronischen und optischen Erzeugnissen, elektrischen Ausrüstungen (SU 16), Allgemeine Herstellung, z. B. Maschinen, Ausrüstungen, Fahrzeuge, sonstige Transportausrüstung (SU 17)

|  |  |
| --- | --- |
| **Umwelt** |  |
| 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 |
| **Arbeitnehmer** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**3.2.1. Kontrolle der Exposition von Arbeitnehmerns**

**Für alle Beitragsszenarien geltende Verwendungsbedingungen**

|  |
| --- |
| **Technische und organisatorische Bedingungen und Maßnahmen** |
| Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision. |
| **Bedingungen und Maßnahmen im Zusammenhang mit persönlichen Schutzausrüstungen, Hygiene und Gesundheitsbewertung** |
| 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.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Arbeitnehmern** |
| Assumes process temperature up to 20 °C |

​

**Pro Beitragsszenarium geltende besondere Verwendungsbedingungen**

|  |  |
| --- | --- |
| **Beitragsszenarium** | **Gezielte Maßnahmen** |
| ***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. Expositionsabschätzung und Verweis auf ihren Ursprung**

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.4. Exposition des Arbeitnehmers: Chemical production where opportunity for exposure arises (PROC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.5. Exposition des Arbeitnehmers: Mixing or blending in batch processes (PROC 5)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.6. Exposition des Arbeitnehmers: Calendering operations (PROC 6)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.7. Exposition des Arbeitnehmers: Indoor use; Industrial spraying; Solid in solution (PROC 7)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

**3.3.8. Exposition des Arbeitnehmers: Outdoor use; Industrial spraying (PROC 7)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

**3.3.9. Exposition des Arbeitnehmers: Outdoor use; Industrial spraying (PROC 7)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.05 mg/m³ (TRA Workers 3.0) | 0.01 |
| Inhalation, lokal, akut | 0.2 mg/m³ (TRA Workers 3.0) | 0.02 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.035 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.14 mg/m³ (TRA Workers 3.0) | 0.014 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.19. Exposition des Arbeitnehmers: *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)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

**3.3.21. Exposition des Arbeitnehmers: Roller application or brushing (PROC 10)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**3.3.22. Exposition des Arbeitnehmers: Treatment of articles by dipping and pouring (PROC 13)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.23. Exposition des Arbeitnehmers: Tabletting, compression, extrusion, pelettisation, granulation (PROC 14)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

**3.3.24. Exposition des Arbeitnehmers: Use as laboratory reagent (PROC 15, PROC 26, PROC 27b)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (TRA Workers 3.0) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (TRA Workers 3.0) | 0.2 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, lokal, akut | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.1 mg/m³ (TRA Workers 3.0) | 0.02 |
| Inhalation, lokal, akut | 0.4 mg/m³ (TRA Workers 3.0) | 0.04 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.03 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.12 mg/m³ (TRA Workers 3.0) | 0.012 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.5 mg/m³ (ECETOC TRA Workers) | 0.1 |
| Inhalation, lokal, akut | 2 mg/m³ (ECETOC TRA Workers) | 0.2 |

**3.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**

Skalierungswerkzeug: 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.

**Kapitel 4. ES 4: Breite Verwendung durch gewerbliche Anwender; Verschiedene Sektoren (SU 0, SU 1, SU 13, SU 19, SU 20)**

**4.1. Titel-Abschnitt**

ES-.ezeichnung: Professional use; Indoor use

Verwendungssektor: Sonstiges (SU 0), Land- und Forstwirtschaft, Fischerei (SU 1), Herstellung von sonstigen nichtmetallischen mineralischen Produkten, z. B. Gips, Zement (SU 13), Bauwirtschaft (SU 19), Gesundheitswesen (SU 20)

|  |  |
| --- | --- |
| **Umwelt** |  |
| 1: Indoor use; Professional use | ERC 8a |
| **Arbeitnehmer** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**4.2.1. Kontrolle der Exposition von Arbeitnehmerns**

**Für alle Beitragsszenarien geltende Verwendungsbedingungen**

|  |
| --- |
| **Bedingungen und Maßnahmen im Zusammenhang mit persönlichen Schutzausrüstungen, Hygiene und Gesundheitsbewertung** |
| *Use suitable eye protection.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Arbeitnehmern** |
| Indoor use |
| Assumes process temperature up to 20 °C |

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**Pro Beitragsszenarium geltende besondere Verwendungsbedingungen**

|  |  |
| --- | --- |
| **Beitragsszenarium** | **Gezielte Maßnahmen** |
| ***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. Expositionsabschätzung und Verweis auf ihren Ursprung**

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.01 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.04 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.4. Exposition des Arbeitnehmers: Chemical production where opportunity for exposure arises (PROC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.5. Exposition des Arbeitnehmers: Mixing or blending in batch processes (PROC 5)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.4 mg/m³ (TRA Workers 3.0) | 0.28 |
| Inhalation, lokal, akut | 5.6 mg/m³ (TRA Workers 3.0) | 0.56 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.9. Exposition des Arbeitnehmers: Roller application or brushing (PROC 10)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.10. Exposition des Arbeitnehmers: Indoor use; Non-industrial spraying; Solid in solution (PROC 11)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

**4.3.11. Exposition des Arbeitnehmers: Use as laboratory reagent (PROC 15, PROC 26)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**4.3.12. Exposition des Arbeitnehmers: Manual activities involving hand contact (PROC 19)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**4.3.13. Exposition des Arbeitnehmers: Use of functional fluids in small devices (PROC 20)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1 mg/m³ (TRA Workers 3.0) | 0.2 |
| Inhalation, lokal, akut | 4 mg/m³ (TRA Workers 3.0) | 0.4 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (ECETOC TRA Workers) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (ECETOC TRA Workers) | 0.28 |

**4.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**

Skalierungswerkzeug: 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.

**Kapitel 5. ES 5: Breite Verwendung durch gewerbliche Anwender; Verschiedene Sektoren (SU 0, SU 1, SU 5, SU 13, SU 19, SU 20)**

**5.1. Titel-Abschnitt**

ES-.ezeichnung: Professional use; Outdoor use

Verwendungssektor: Sonstiges (SU 0), Land- und Forstwirtschaft, Fischerei (SU 1), Herstellung von Textilien, Leder, Pelzen (SU 5), Herstellung von sonstigen nichtmetallischen mineralischen Produkten, z. B. Gips, Zement (SU 13), Bauwirtschaft (SU 19), Gesundheitswesen (SU 20)

|  |  |
| --- | --- |
| **Umwelt** |  |
| 1: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) | ERC 8d |
| **Arbeitnehmer** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**5.2.1. Kontrolle der Exposition von Arbeitnehmerns**

**Für alle Beitragsszenarien geltende Verwendungsbedingungen**

|  |
| --- |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Arbeitnehmern** |
| Outdoor use |
| Assumes process temperature up to 20 °C |

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**Pro Beitragsszenarium geltende besondere Verwendungsbedingungen**

|  |  |
| --- | --- |
| **Beitragsszenarium** | **Gezielte Maßnahmen** |
| ***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. Expositionsabschätzung und Verweis auf ihren Ursprung**

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 7E-3 mg/m³ (TRA Workers 3.0) | < 0.01 |
| Inhalation, lokal, akut | 0.028 mg/m³ (TRA Workers 3.0) | < 0.01 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.4. Exposition des Arbeitnehmers: Chemical production where opportunity for exposure arises (PROC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.5. Exposition des Arbeitnehmers: Mixing or blending in batch processes (PROC 5)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

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

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.9. Exposition des Arbeitnehmers: Roller application or brushing (PROC 10)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.10. Exposition des Arbeitnehmers: Outdoor use; Non-industrial spraying (PROC 11)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

**5.3.11. Exposition des Arbeitnehmers: Outdoor use; Non-industrial spraying (PROC 11)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 1.2 mg/m³ (ART) | 0.24 |
| Inhalation, lokal, akut | 9.6 mg/m³ (ART) | 0.96 |

**5.3.12. Exposition des Arbeitnehmers: Use as laboratory reagent (PROC 15, PROC 26)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.13. Exposition des Arbeitnehmers: Mixing operations; Manual activities involving hand contact (PROC 19)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.35 mg/m³ (TRA Workers 3.0) | 0.07 |
| Inhalation, lokal, akut | 1.4 mg/m³ (TRA Workers 3.0) | 0.14 |

**5.3.14. Exposition des Arbeitnehmers: *Equipment cleaning and maintenance at non-dedicated facility* (PROC 8a)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.3.15. Exposition des Arbeitnehmers: Use of functional fluids in small devices (PROC 20)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.7 mg/m³ (TRA Workers 3.0) | 0.14 |
| Inhalation, lokal, akut | 2.8 mg/m³ (TRA Workers 3.0) | 0.28 |

**5.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**

Anleitung: 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.

**Kapitel 6. ES 6: Verwendung durch Verbraucher; Verschiedene Produkte (PC 0, PC 2, PC 4, PC 12, PC 16, PC 27, PC 35, PC 37)**

**6.1. Titel-Abschnitt**

ES-.ezeichnung: Consumer use; Indoor or outdoor use

Produktkategorie: Sonstiges (PC 0), Adsorptionsmittel (PC 2), Frostschutz- und Enteisungsmittel (PC 4), Düngemittel (PC 12), Wärmeübertragungsflüssigkeiten (PC 16), Pflanzenschutzmittel (PC 27), Wasch- und Reinigungsmittel (PC 35), Wasserbehandlungschemikalien (PC 37)

|  |  |
| --- | --- |
| **Umwelt** |  |
| 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 |
| **Verbraucher** |  |
| 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. Verwendungsbedingungen mit Auswirkung auf die Exposition**

**6.2.1. Kontrolle der Exposition von Verbrauchern: Dust suppressant; No spraying (PC 0)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.2. Kontrolle der Exposition von Verbrauchern: Dust suppressant; Spraying (PC 0)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| 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* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.3. Kontrolle der Exposition von Verbrauchern: *Humidity adsorbants* (PC 0)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.4. Kontrolle der Exposition von Verbrauchern: *Cement/concrete/mortar* (PC 0)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.5. Kontrolle der Exposition von Verbrauchern: Adsorbents (PC 2)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.6. Kontrolle der Exposition von Verbrauchern: Anti-freeze and de-icing products; No spraying (PC 4)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| 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* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.7. Kontrolle der Exposition von Verbrauchern: Anti-freeze and de-icing products; Spraying (PC 4)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| 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* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.8. Kontrolle der Exposition von Verbrauchern: Fertilizers; No spraying (PC 12)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.9. Kontrolle der Exposition von Verbrauchern: Fertilizers; Spraying (PC 12)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| 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* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.10. Kontrolle der Exposition von Verbrauchern: Heat transfer fluids (PC 16)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.11. Kontrolle der Exposition von Verbrauchern: Plant protection products; No spraying (PC 27)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.12. Kontrolle der Exposition von Verbrauchern: Plant protection products; Spraying (PC 27)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| 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* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.2.13. Kontrolle der Exposition von Verbrauchern: Water treatment chemicals (PC 37)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| *Covers exposure via inhalation route* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.14. Kontrolle der Exposition von Verbrauchern: Washing and cleaning products; No spraying (PC 35)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| Covers concentrations up to 100 % |
| *Solid, medium dustiness. Covers also liquid form* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers use up to 24 h* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |
| **Andere Bedingungen mit Auswirkung auf die Exposition von Verbrauchern** |
| Release area <= 125 m2 |

**6.2.15. Kontrolle der Exposition von Verbrauchern: Washing and cleaning products; Spraying (PC 35)**

|  |
| --- |
| **Produkt-/Erzeugnismerkmale** |
| 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* |
| **Verwendete Menge, Verwendungshäufigkeit und -dauer/Expositionshäufigkeit und -dauer** |
| Covers use up to 1 events per day |
| *Covers 10 minutes spraying application* |
| **Informationen und Verhaltensempfehlungen für Verbraucher** |
| *Requires room with good ventilation* |
| *Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands.* |

**6.3. Expositionsabschätzung und Verweis auf ihren Ursprung**

**6.3.1. Exposition von Verbrauchern: Dust suppressant; No spraying (PC 0)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.2. Exposition von Verbrauchern: Dust suppressant; Spraying (PC 0)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, lokal, akut | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.3. Exposition von Verbrauchern: *Humidity adsorbants* (PC 0)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.4. Exposition von Verbrauchern: *Cement/concrete/mortar* (PC 0)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.5. Exposition von Verbrauchern: Adsorbents (PC 2)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.6. Exposition von Verbrauchern: Anti-freeze and de-icing products; No spraying (PC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.7. Exposition von Verbrauchern: Anti-freeze and de-icing products; Spraying (PC 4)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, lokal, akut | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.8. Exposition von Verbrauchern: Fertilizers; No spraying (PC 12)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.9. Exposition von Verbrauchern: Fertilizers; Spraying (PC 12)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, lokal, akut | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.10. Exposition von Verbrauchern: Heat transfer fluids (PC 16)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.11. Exposition von Verbrauchern: Plant protection products; No spraying (PC 27)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.12. Exposition von Verbrauchern: Plant protection products; Spraying (PC 27)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, lokal, akut | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.3.13. Exposition von Verbrauchern: Water treatment chemicals (PC 37)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.14. Exposition von Verbrauchern: Washing and cleaning products; No spraying (PC 35)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 5E-3 mg/m³ (ConsExpo) | < 0.01 |
| Inhalation, lokal, akut | 0.01 mg/m³ (ConsExpo) | < 0.01 |

**6.3.15. Exposition von Verbrauchern: Washing and cleaning products; Spraying (PC 35)**

| **Expositionsweg und Auswirkungsarten** | **Expositionsabschätzung** | **RCR** |
| --- | --- | --- |
| Inhalation, lokal, Langzeit- | 0.687 mg/m³ (ConsExpo) | 0.275 |
| Inhalation, lokal, akut | 0.69 mg/m³ (ConsExpo) | 0.138 |

**6.4. Leitlinien für nachgeschaltete Anwender, um zu überprüfen, ob sie innerhalb der im Expositionsszenarium festgelegten Grenzen arbeiten**