

## Sicherheitsdatenblatt

gemäß Artikel 32 (nicht gefährliche Stoffe) der Verordnung (EG) Nr.1907/2006 (REACH)

Produktbezeichnung:  
erstellt am: 10.02.2012

**Calciumcarbonatschlamm**  
überarbeitet am: 22.03.2012

Materialnummer: 406  
Ausgabedatum: 23.03.2012 Seite 1 von 7

### ABSCHNITT 1: Bezeichnung des Stoffes / der Mischung und Firmenbezeichnung

<b>1.1</b>	<b>Produktidentifikator</b>	
<b>1.1.1</b>	<b>Bezeichnung auf dem Kennzeichnungsschild/ Handelsname:</b>	<b>Calciumcarbonatschlamm</b>
<b>1.1.2</b>	<b>Zusätzliche Bezeichnungen:</b>	<b>Kalkschlamm</b>
<b>1.1.3</b>	<b>REACH Registrierungsnummer:</b>	n.a. für Mischungen
<b>1.2</b>	<b>Relevante identifizierte Verwendungen des Stoffs und Verwendungen, von denen abgeraten wird</b>	
<b>1.2.1</b>	<b>Relevante identifizierte Verwendungen:</b>	ES 1: Herstellung und industrielle Verwendung von Calciumcarbonat ES 2: Verwendung von Calciumcarbonat als solches und in Mischungen in nicht-industriellen Verwendungen
<b>1.2.2</b>	<b>Verwendungen, von denen abgeraten wird:</b>	Keine bekannt
<b>1.3</b>	<b>Einzelheiten zum Lieferanten, der das Sicherheitsdatenblatt bereitstellt</b>	
<b>1.3.1</b>	<b>EG-Inverkehrbringer (Hersteller):</b>	Salzgitter Flachstahl GmbH
<b>1.3.2</b>	<b>Hausadresse:</b>	Eisenhüttenstraße 99, 38239 Salzgitter
<b>1.3.3</b>	<b>Postadresse:</b>	38223 Salzgitter
<b>1.3.4</b>	<b>Land</b>	Deutschland
<b>1.3.5</b>	<b>Telefon:</b>	05341 / 21-01
<b>1.3.6</b>	<b>Telefax:</b>	05341 / 21-39 21
<b>1.3.7</b>	<b>Auskunft gebender Bereich:</b>	Hauptabteilung Arbeitssicherheit Tel. 05341 / 21-22 01 Fax. 05341 / 21-39 21
<b>1.3.8</b>	<b>E-Mail (sachkundige Person):</b>	szfg.reach@salzgitter-ag.de
<b>1.4</b>	<b>Notrufnummer: (24 h/d besetzt)</b>	05341 / 21-112 (Werkfeuerwehr)

### ABSCHNITT 2: Mögliche Gefahren

<b>2.1</b>	<b>Einstufung des Stoffes oder Gemisches</b>	
<b>2.1.1</b>	<b>Gemäß RL 1999/45/EG Gef. Zubereitungen:</b>	nicht eingestuft entsprechend der RL 1999/45/EG
<b>2.1.2</b>	<b>Gemäß Verordnung (EG) Nr. 1272/2008:</b>	nicht eingestuft entsprechend VO (EG) Nr. 1272/2008
<b>2.2</b>	<b>Kennzeichnungselemente</b>	
<b>2.2.1</b>	<b>Kennzeichnungselement/e RL 1999/45/EG:</b>	nicht kennzeichnungspflichtig entsprechend RL 1999/45/EG
<b>2.2.2</b>	<b>Kennzeichnungselemente VO (EG) Nr.1272/2008 :</b>	nicht kennzeichnungspflichtig entsprechend VO (EG) Nr. 1272/2008
<b>2.2.2</b>	<b>Signalwort:</b>	n.a.
<b>2.2.3</b>	<b>Gefahrenhinweise:</b>	n.a.
<b>2.2.4</b>	<b>Sicherheitshinweise:</b>	n.a.
<b>2.3</b>	<b>Zusätzliche Gefahrenhinweise für Mensch und Umwelt:</b>	keine

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### ABSCHNITT 3: Zusammensetzung / Angaben zu Bestandteilen

**3.1 Chemische Charakterisierung (Mischung):** Suspension von Calciumcarbonat in Wasser

#### **3.2 Inhaltsstoffe:**

Reach Registriernummer: 01-2119486795-18-0006 **Bezeichnung:** Calciumcarbonat

EG-Nr.	CAS-Nr.	Anteil [%]	Einstufung Richtl. 67/548/EWG	Einstufung VO (EG) Nr.1272/2008
207-439-9	471-34-1	ca. 55%	nicht eingestuft	nicht eingestuft

Reach Registriernummer: n.a. **Bezeichnung:** Wasser

EG-Nr.	CAS-Nr.	Anteil [%]	Einstufung Richtl. 67/548/EWG	Einstufung VO (EG) Nr.1272/2008
231-791-2	7732-18-5	ca. 45%	nicht eingestuft	nicht eingestuft

**3.3 Zusatzinformationen:** keine

### ABSCHNITT 4: Erste Hilfe Maßnahmen

#### **4.1 Beschreibung der Erste-Hilfe Maßnahmen**

- 4.1.1 Allgemeine Hinweise:** Beschmutzte, getränkte Kleidung sofort ausziehen.
- 4.1.2 Nach Einatmen:** Die betroffene Person an die frische Luft bringen. Gesicht abwaschen, Mund und Nase mit Wasser spülen.
- 4.1.3 Nach Hautkontakt:** Betroffene Hautpartie mit viel Wasser spülen.
- 4.1.4 Nach Augenkontakt:** Auge unter Schutz des unverletzten Auges mindestens 10 Minuten unter fließendem Wasser bei weitgespreizten Lidern spülen. Bei anhaltenden Beschwerden: Augenarzt hinzuziehen.
- 4.1.5 Nach Verschlucken:** Mund sofort mit Wasser ausspülen und reichlich Wasser trinken lassen. Kein Erbrechen herbeiführen.
- 4.2 Wichtigste akute und verzögert auftretende Symptome und Wirkungen:** keine
- 4.3 Hinweise für den Arzt:** Hinweise zur Toxikologie siehe ABSCHNITT 11.

### ABSCHNITT 5: Maßnahmen zur Brandbekämpfung

- 5.1 Geeignete Löschmittel:** Löschmaßnahmen auf die Umgebung abstimmen. Stoff selbst brennt nicht.
- 5.2 Aus Sicherheitsgründen ungeeignete Löschmittel:** keine
- 5.3 Besondere vom Stoff ausgehende Gefahren:** Bei sehr hohen Temperaturen (>600°C) kann Kohlendioxid freigesetzt werden.
- 5.4 Besondere Schutzausrüstung bei der Brandbekämpfung:** Schutzausrüstung auf die Umgebung abstimmen.
- 5.5 Zusätzliche Hinweise:** Kontaminiertes Löschwasser getrennt sammeln. Nicht in die Kanalisation, Oberflächenwasser oder Grundwasser gelangen lassen.

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### ABSCHNITT 6: Maßnahmen bei unbeabsichtigter Freisetzung

- 6.1 Personenbezogene Vorsichtsmaßnahmen:** Schutzausrüstung tragen. Bei Staubbildung Atemschutzgerät tragen. Ungeschützte Personen fernhalten. Für ausreichende Lüftung sorgen.
- 6.2 Umweltschutzmaßnahmen:** keine
- 6.3 Methoden und Material für Rückhaltung und Reinigung:** Beim Aufnehmen Staubbildung vermeiden.

### ABSCHNITT 7: Handhabung und Lagerung

- 7.1 Schutzmaßnahmen zur sicheren Handhabung:**
- 7.1.1 Hinweise zum sicheren Umgang:** Staubbildung vermeiden. Kontakt mit Haut, Augen und Kleidung vermeiden.
- 7.1.2 Technische Maßnahmen:** Bei Staubbildung: Für ausreichende Belüftung sorgen und ggf. lokale Absaugung verwenden. Augenspülvorrichtung / Spülflasche in Arbeitsplatznähe bereit halten.
- 7.1.3 Hinweise zum Brand- und Explosionsschutz:** keine.
- 7.1.4 Allgemeine Hygienemaßnahmen:** Im Arbeitsbereich nicht Essen, Trinken oder Rauchen. Keine Lebensmittel im Arbeitsbereich aufbewahren. Nach Arbeitsende und vor den Pausen Hände waschen.
- 7.2 Bedingungen zur sicheren Lagerung:** Staubbildung vermeiden.
- 7.3 Spezifische Endanwendungen:** Siehe Expositionsszenarien im Anhang.

### ABSCHNITT 8: Begrenzung und Überwachung der Exposition/Persönliche Schutzausrüstung

#### 8.1 Expositionsgrenzwerte

##### 8.1.1 Arbeitsplatzgrenzwerte (TRGS 900):

EG-Nr.	CAS-Nr.	Bezeichnung	Fraktion	mg/m <sup>3</sup>	Spitzenbegrenzung
207-439-9	7647-01-0	Calciumcarbonat	alveolengängig	3	2 (II)
207-439-9	7647-01-0	Calciumcarbonat	einatembar	10	2 (II)

##### 8.1.2 DNEL- und PNEC-Werte:

###### Abgeleitete Expositionshöhe ohne Beeinträchtigung (DNEL):

Calciumcarbonat

Arbeiter (Langzeitwert, systemische Effekte) Einatmen:  
DNEL = 10 mg/m<sup>3</sup>

Arbeiter (Kurzzeitwert, systemische Effekte) Verschlucken:  
DNEL = 6,1 mg/kg/bw/day

Arbeiter (Langzeitwert, systemische Effekte) Verschlucken:  
DNEL = 6,1 mg/kg/bw/day

###### Abgeschätzte Nicht-Effekt-Konzentration (PNEC):

Calciumcarbonat

Süßwasser: nicht relevant (keine aquatische Toxizität)

Meerwasser: nicht relevant (keine aquatische Toxizität)

Kläranlage: 100 mg/l (NOEC, AF = 10)

Sediment: nicht relevant (Ca-Ionen und Carbonat-Ionen sind ubiquitär im Sediment vorhanden.)

Boden: nicht relevant (keine Ökotoxizität)

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### 8.2 Begrenzung und Überwachung der Exposition

#### 8.2.1 Begrenzung und Überwachung der Exposition am Arbeitsplatz:

vgl. ABSCHNITT 7

#### 8.2.2 Atemschutz:

Bei Auftreten von Staub Atemschutzgerät mit Partikelschutz P2 tragen.

#### 8.2.3 Handschutz:

Die Chemikalienbeständigkeit der Schutzhandschuhe ist mit dem Lieferanten abzuklären und muss den Spezifikationen der EG-Richtlinie 89/686/EWG und der daraus ergebenden Norm EN374 genügen. Geeignet sind Handschuhe aus folgenden Materialien

Bei Voll- und Spritzkontakt:

Handschuhmaterial: Baumwollhandschuhe mit Nitrilkautschuk  
Durchbruchzeit: > 480 Min.

#### 8.2.4 Augenschutz:

Bei Auftreten von Staub und Spritzern Schutzbrille tragen.

#### 8.2.5 Körperschutz:

Arbeitskleidung tragen.

### 8.3 Begrenzung und Überwachung der Umweltexposition:

Siehe ABSCHNITT 7. Es sind keine darüber hinausgehenden Maßnahmen erforderlich.

## ABSCHNITT 9: Physikalische und chemische Eigenschaften

### 9.1 Allgemeine Angaben

#### 9.1.1 Aggregatzustand:

Suspension

#### 9.1.2 Farbe:

weiß

#### 9.1.3 Geruch:

geruchslos

#### 9.1.4 pH-Wert:

9,5

#### 9.1.5 Schmelzpunkt/ -bereich:

n.z.

#### 9.1.6 Siedepunkt/-bereich:

n.z. (1013 hPa)

#### 9.1.7 Dichte:

n.z. (20°C)

#### 9.1.8 Wasserlöslichkeit:

CaCO<sub>3</sub>: 0,0166 g/l (20°C)

#### 9.1.9 Flammpunkt:

n.z. (1013 hPa)

#### 9.1.10 Zündtemperatur:

n.z. (1013 hPa)

#### 9.1.11 Untere Explosionsgrenze:

n.z.

#### 9.1.12 Obere Explosionsgrenze:

n.z.

#### 9.1.13 Dampfdruck:

k.D.v. (20°C)

### 9.2 Sonstige Angaben:

keine

## ABSCHNITT 10: Stabilität und Reaktivität

### 10.1 Reaktivität:

Nicht reaktiv unter normalen Bedingungen.

### 10.2 Chemische Stabilität:

Stabil unter normalen Bedingungen.

### 10.3 Möglichkeit gefährlicher Reaktionen:

Bei Kontakt mit Säuren kann CO<sub>2</sub> freigesetzt werden.

### 10.4 Zu vermeidende Bedingungen:

Bei sehr starkem Erhitzen und Kontakt mit Säuren kann CO<sub>2</sub> freigesetzt werden.

### 10.5 Unverträgliche Materialien:

Säuren.

### 10.6 Gefährliche Zersetzungsprodukte:

CO<sub>2</sub>.

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### ABSCHNITT 11: Toxikologische Angaben

#### 11.1 Akute Wirkungen

- 11.1.1 Akute Toxizität:** Für die Mischung sind keine Daten verfügbar.  
**oral:**  
Ratte  
LD 50: > 2000 mg/kg bw (CaCO<sub>3</sub>) (CSR)  
**inhalativ:**  
Ratte, Prüfatmosphäre: Staub  
LC 50: > 3 mg/l (CaCO<sub>3</sub>) (CSR)  
**dermal:**  
Ratte  
LD 50: > 2000 mg/kg (CaCO<sub>3</sub>) (CSR)
- 11.1.2 Reiz- / Ätzwirkung auf die Haut:** Es gibt keinen Hinweis darauf, dass Calciumcarbonat reizend oder ätzend auf die Haut wirkt. (CSR)
- 11.1.2 Reiz- / Ätzwirkung auf die Augen:** Es gibt keinen Hinweis darauf, dass Calciumcarbonat reizend oder ätzend auf die Augen wirkt. (CSR)
- 11.2 Sensibilisierung:** Es gibt keinen Hinweis darauf, dass Calciumcarbonat sensibilisierend für die Haut ist. (CSR)
- 11.3 Toxizität bei wiederholter Aufnahme:** Es gibt keinen Hinweis darauf, dass Calciumcarbonat chronisch toxisch wirkt. (CSR)
- 11.4 CMR-Wirkungen (krebserzeugende, erbgutverändernde und fortpflanzungsgef. Wirkung)**
- 11.4.1 Mutagen:** Es gibt keine Hinweise darauf, dass Calciumcarbonat eine mutagene Wirkung hat. (CSR)
- 11.4.2 Karzinogen:** Es gibt keine Hinweise darauf, dass Calciumcarbonat eine karzinogene Wirkung hat. (CSR)
- 11.4.3 Reproduktionstoxisch:** Es gibt keine Hinweise darauf, dass Calciumcarbonat reproduktionstoxisch wirkt. (CSR)
- 11.5 Zielorgantoxisch (STOT):** Es gibt keine Hinweise darauf, dass Calciumcarbonat zielorgantoxisch wirkt. (CSR)
- 11.6 Aspirationstoxisch:** Keine Daten verfügbar.

### ABSCHNITT 12: Umweltbezogene Angaben

- 12.1 Ökotoxizität:** Für die Mischung sind keine Daten verfügbar.
- 12.1.1 Aquatisch:**
- 12.1.1.1 Fischtoxizität:** Für CaCO<sub>3</sub> (*Fisch: Oncorhynchus mykiss*)  
LC50 (96 h): größer als die Löslichkeit (CSR)
- 12.1.1.2 Daphnientoxizität:** Für CaCO<sub>3</sub> (*Wirbellose: Daphnia magna*)  
LC50 (48h): größer als die Löslichkeit (CSR)
- 12.1.1.3 Algentoxizität:** Für CaCO<sub>3</sub> (*Alge: Desmodesmus subspicatus*)  
EC50 (72h): > 14 mg/l (größer als die Löslichkeit) (CSR)

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### 12.1.1 Terrestrisch:

#### 12.1.2.1 Bakterientoxizität:

Für CaCO<sub>3</sub> (*Belebtschlamm*)

EC50 (3h): >1000 mg/l

(CSR)

#### 12.1.2.2 Regenwurmtoxizität:

Für CaCO<sub>3</sub> (Regenwurm: *Eisenia fetida*)

LC50 (14d): > 1000 mg/kg Trockenerde

(CSR)

#### 12.1.2.3 Pflanzentoxizität:

Für CaCO<sub>3</sub> (Pflanze: *Glycine max*)

EC50 (21d): > 1000 mg/kg Trockenerde

(CSR)

Für CaCO<sub>3</sub> (Pflanze: *Lycopersicon esculentum*)

EC50 (21d): > 1000 mg/kg Trockenerde

(CSR)

### 12.2 Persistenz und Abbaubarkeit:

Die Methoden zur Bestimmung der biologischen Abbaubarkeit sind bei anorganischen Stoffen nicht anwendbar.

### 12.3 Bioakkumulationspotenzial:

Keine Daten verfügbar.

### 12.4 Mobilität im Boden:

Keine Daten verfügbar.

### 12.5 Ergebnis der Ermittlung der PBT-Eigenschaften:

Diese Mischung erfüllt nicht die Kriterien für eine Einstufung als PBT oder als vPvB.

### 12.6 Weitere ökologische Hinweise:

keine

## ABSCHNITT 13: Hinweise zur Entsorgung

### 13.1 Verfahren zur Abfallbehandlung:

Produktreste sind unter der Beachtung der Abfallrichtlinie 2008/98/EG zu entsorgen.

### 13.2 Vorschlagsliste für Abfallschlüssel/ Abfallbezeichnungen gemäß EAKV:

190903 (Schlämme aus der Decarbonisierung)

### 13.3 Verpackung:

Keine Daten vorhanden.

## ABSCHNITT 14: Angaben zum Transport

Diese Mischung ist nicht als gefährlich eingestuft entsprechend der Transportrichtlinien.

## ABSCHNITT 15: Rechtsvorschriften

### 15.1 Vorschriften zu Sicherheit, Gesundheits- und Umweltschutz/spezifische Rechtsvorschriften für den Stoff oder das Gemisch

#### 15.1.1 Beschäftigungsbeschränkung:

keine

#### 15.1.2 Wassergefährdungsklasse:

nwg gemäß Kenn-Nr. 317

#### 15.1.3 Störfallverordnung:

nicht zutreffend

#### 15.1.3 Zusätzliche Hinweise zu nationalen

##### Vorschriften:

Die nationalen Vorschriften sind zu beachten.

### 15.2 Stoffsicherheitsbeurteilung:

Im Rahmen der REACH-Verordnung (EG) Nr.1907/2006 wurde eine Stoffsicherheitsbeurteilung für Calciumcarbonat durchgeführt, welche im Stoffsicherheitsbericht (CSR) dokumentiert ist.

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## **ABSCHNITT 16: Sonstige Angaben**

- 16.1 Änderungen:** keine
- 16.2 Literatur, Quellen:** **Stoffsicherheitsbericht (CSR Chemical Safety Report)**  
"Calciumcarbonat" erstellt gemäß Verordnung (EG) Nr.1907/2006.  
**Institut für Arbeitsschutz der gesetzlichen Unfallversicherungen:**  
GESTIS Stoffdatenbank  
<http://www.dguv.de/ifa/de/gestis/stoffdb/index.jsp>
- 16.3 Liste der identifizierten Verwendungen:**
- k.D.v. = keine Daten vorhanden  
n.z. = nicht zutreffend  
n.d. = nicht durchführbar  
u.a. = unter anderem  
n.a. = nicht anwendbar
- 16.4 Weitere Informationen:**
- Abkürzungen:  
k.D.v. = keine Daten vorhanden  
n.z. = nicht zutreffend  
n.d. = nicht durchführbar  
u.a. = unter anderem  
nwg = nicht wassergefährdend  
n.a. = nicht anwendbar

### *Erklärung:*

*Dieses Sicherheitsdatenblatt ist überarbeitet worden gemäß Anhang II der REACH Verordnung (2010). Die in diesem Sicherheitsdatenblatt verwendeten Daten beruhen auf dem Registrierungsdossier und dem Chemischen Sicherheitsbericht für Calciumcarbonat. Die Angaben in diesem Sicherheitsdatenblatt stützen sich auf den heutigen Stand unserer Kenntnisse und Erfahrungen. Das Sicherheitsdatenblatt beschreibt die Produkte im Hinblick auf Sicherheitserfordernisse. Die Angaben haben nicht die Bedeutung von Eigenschaftszusicherungen*

## **ANHANG**

## **Anhang zum EG - Sicherheitsdatenblatt**

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## Summary of Exposure Scenario 1

<b>1. Short title of the exposure scenario 1</b>	
Manufacturing and industrial processing of calcium carbonate	
<b>2. Description of processes and activities covered by the exposure scenario</b>	
Sector of use (SU)	<ul style="list-style-type: none"> <li>1: Agriculture, forestry, fishery</li> <li>2a: Mining, (without offshore industries)</li> <li>2b: Offshore industries</li> <li>3: Industrial uses: Uses of substances as such or in preparations at industrial sites</li> <li>4: Manufacture of food products</li> <li>5: Manufacture of textiles, leather, fur</li> <li>6a: Manufacture of wood and wood products</li> <li>6b: Manufacture of pulp, paper and paper products</li> <li>7: Printing and reproduction of recorded media</li> <li>8: Manufacture of bulk, large scale chemicals (including petroleum products)</li> <li>9: Manufacture of fine chemicals</li> <li>10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</li> <li>11: Manufacture of rubber products</li> <li>12: Manufacture of plastics products, including compounding and conversion</li> <li>13: Manufacture of plastics products, including compounding and conversion</li> <li>14: Manufacture of basic metals, including alloys</li> <li>15: Manufacture of fabricated metal products, except machinery and equipment</li> <li>16: Manufacture of computer, electronic and optical products, electrical equipment</li> <li>17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment</li> <li>18: Manufacture of furniture</li> <li>19: Building and construction work</li> <li>20: Health services</li> <li>23: Electricity, steam, gas water supply and sewage treatment</li> <li>24: Scientific research and development</li> </ul>
Product category (PC)	<ul style="list-style-type: none"> <li>1: Adhesives, sealants</li> <li>2: Adsorbents</li> <li>3: Air care products</li> <li>4: Anti-Freeze and de-icing products</li> <li>7: Base metals and alloys</li> <li>8: Biocidal products (e.g. Disinfectants, pest control)</li> <li>9a: Coatings and paints, thinners, paint removers</li> <li>9b: Fillers, putties, plasters, modelling clay</li> <li>9c: Finger paints</li> <li>11: Explosives</li> <li>12: Fertilisers</li> <li>14: Metal surface treatment products, including galvanic and electroplating products (This covers substances permanently binding with the metal surface)</li> <li>15: Non-metal-surface treatment products (Like for example treatment of walls before painting.)</li> </ul>

	<p>16: Heat transfer fluids  17: Hydraulic fluids  18: Ink and toners  19: Intermediate  20: Products such as ph-regulators, flocculants, precipitants, neutralization agents (This category covers processing aids used in the chemical industry)  21: Laboratory chemicals  23: Leather tanning, dye, finishing, impregnation and care products  24: Lubricants, greases, release products  25: Metal working fluids  26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids  27: Plant protection products  28: Perfumes, fragrances  29: Pharmaceuticals  30: Photo-chemicals  31: Polishes and wax blends  32: Polymer preparations and compounds  33: Semiconductors  34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids;  35: Washing and cleaning products (including solvent based products)  36: Water softeners  37: Water treatment chemicals  38: Welding and soldering products (with flux coatings or flux cores.), flux products  39: Cosmetics, personal care products  40: Extraction agents</p>
Process category (PROC)	<p>1: Use in closed process, no likelihood of exposure  2: Use in closed, continuous process with occasional controlled exposure  3: Use in closed batch process (synthesis or formulation)  4: Use in batch and other process (synthesis) where opportunity for exposure arises  5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)  6: Calendering operations  7: Industrial spraying  8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  10: Roller application or brushing  12: Use of blowing agents in manufacture of foam  13: Treatment of articles by dipping and pouring  14: Production of preparations or articles by tableting, compression, extrusion, pelletisation  15: Use as laboratory reagent  17: Lubrication at high energy conditions and in partly open process  18: Greasing at high energy conditions</p>

	<p>19: Hand-mixing with intimate contact and only PPE available  21: Low energy manipulation of substances bound in materials and/or articles  22: Potentially closed processing operations with minerals/metals at elevated temperature  23: Open processing and transfer operations with minerals/metals at elevated temperature  24: High (mechanical) energy work-up of substances bound in materials and/or articles  25: Other hot work operations with metals  26: Handling of solid inorganic substances at ambient temperature  27a: Production of metal powders (hot processes)  27b: Production of metal powders (wet processes)</p>
Article category (AC)	<p>1: Vehicles  2: Machinery, mechanical appliances, electrical/electronic articles  3: Electrical batteries and accumulators  4: Stone, plaster, cement, glass and ceramic articles  5: Fabrics, textiles and apparel  6: Leather articles  7: Metal articles  8: Paper articles  10: Rubber articles  11: Wood articles  13: Plastic articles  31: Scented clothes  32: Scented eraser  34: Scented Toys  35: Scented paper articles  36: Scented CD  38: Packaging material for metal parts, releasing grease/corrosion inhibitors</p>
Environmental release category (ERC)	<p>1: Manufacture of substances  2: Formulation of preparations  3: Formulation in materials  4: Industrial use of processing aids in processes and products, not becoming part of articles  5: Industrial use resulting in inclusion into or onto a matrix  6a: Industrial use resulting in manufacture of another substance (use of intermediates)  6b: Industrial use of reactive processing aids  6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers  7: Industrial use of substances in closed systems  8a: Wide dispersive indoor use of processing aids in open systems  8b: Wide dispersive indoor use of reactive substances in open systems  8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix  8d: Wide dispersive outdoor use of processing aids in open systems  8e: Wide dispersive outdoor use of reactive substances in open systems  8f: Wide dispersive outdoor use resulting in inclusion into or</p>

	<p>onto a matrix</p> <p>9a: Wide dispersive indoor use of substances in closed systems</p> <p>9b: Wide dispersive outdoor use of substances in closed systems</p> <p>10a: Wide dispersive outdoor use of long-life articles and materials with low release</p> <p>10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing)</p> <p>11a: Wide dispersive indoor use of long-life articles and materials with low release</p> <p>11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)</p> <p>12a: Industrial processing of articles with abrasive techniques (low release)</p> <p>12b: Industrial processing of articles with abrasive techniques (high release)</p>
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### 3. Operational conditions

#### 3.1. Operational conditions related with frequency and quantities of use

Duration of exposure at workplace:	8 hours per day
Frequency of exposure at workplace:	365 days/year for each worker
Annual amount used per site:	The actual tonnage handled per shift is not considered to influence the exposure as such for this scenario

#### 3.2. Operational conditions related with substance/ product

Physical state	Solid ranging from a fine powder with high dustiness to coarser granules with low dustiness or a slurry
Concentration of substance in mixture	100% w/w for solid calcium carbonate 10 % w/w for slurries or dispersions containing calcium carbonate

#### 3.3. Other relevant operational conditions

In principle, only processes and activities where dust may be generated are relevant in this assessment because no calcium carbonate vapours are released during the processes and dermal and oral exposure to calcium carbonate is not harmful to workers.  
No information about frequency and duration of the various tasks is available.

### 4. Risk Management Measures

#### 4.1 RMMs related to workers

Organisational measures	Local exhaust ventilation is installed at manufacturing sites. The employer has also to ascertain that the required PPE is available and used according to instructions.
Technical measures	Safe conditions were defined by taking into account local exhaust ventilation in the present scenario.
Respiratory protection	If the occupational exposure limit is exceeded and or dust is released then the appropriate respiratory protection should be used. Local exhaust ventilation and dust filters are recommended for indoor sites where high dust formation rates can occur.
Hand protection	Workers use gloves during the handling of the pure, solid substance.
Eye protection	Workers use safety glasses during the handling of the pure, solid substance.
Skin and body protection	Wearing of suitable protective clothing.
Hygiene measures	Standard occupational hygiene measures should be adopted.

<b>4.2. RMMs related to the environment</b>	
Organisational measures	Procedural and/or control technologies are required to minimize emissions and the resulting exposure during cleaning and maintenance procedures.
Abatement measures related to waste air and solid waste.	Solid and liquid waste has to be incinerated or appropriately disposed of as chemical waste.
<b>4.3 Waste related measures</b>	
Type of waste	Solid and liquid waste and packaging material
Disposal technique	Waste can be landfilled when in compliance with local regulations. Containers must be emptied and unused product incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. The empty and clean containers can be reused in conformity with regulations.
<b>5. Prediction of exposure resulting from the conditions described above and the substance properties.</b>	
<b>5.1. Human exposure</b>	
<b>Worker (oral)</b>	
The manufacture and processing of calcium carbonate will not notably contribute to the oral intake of calcium carbonate. Good hygiene practice will also minimise oral exposure.	
<b>Worker (inhalation)</b>	
<b>DNEL: Worker, long-term, systemic, inhalation: 10 mg/m<sup>3</sup> for medium and low dustiness solids and 3 mg/m<sup>3</sup> for high dustiness solids</b>	
<p>The occupational exposure to calcium carbonate was modelled by taking into account three grades of solid products exhibiting low, medium and high dustiness.</p> <p>Occupational exposure to calcium carbonate was calculated with the ECETOC TRA tool (ECETOC, 2010) taking into account the operational conditions. The airborne concentrations for processes with no significant formation of dusts and aerosols was assessed with the ECETOC TRA model as well. For calculating the exposure during roller application or brushing, treatment of articles by dipping, pouring and hand mixing of pastes or paints, a solid material exhibiting low dustiness was assumed as recommended in the Targeted Risk Assessment guidance (ECETOC, 2004, Appendix C). The airborne concentration of aerosols occurring during industrial spraying of paints or similarly viscous mixtures was modelled by considering a solid substance exhibiting high dustiness (ECETOC, 2004, Appendix C). The molecular weight of calcium carbonate of 100.09 g/mol was considered in the calculations.</p> <p>Short peak concentrations of calcium carbonate can occur in situations where clouds of dusts are formed, e.g. in the moment when a transport container is emptied and the powdery product is rushing into the mixing vessel or in processes where mixing with high-energy agitation occurs in open vessels. These short-term concentrations may exceed the 8-hour time-weighted average concentrations but persist for only short duration. It is therefore recommended that respiratory protection is worn in situations with elevated short-term dust concentrations.</p> <p>The long-term airborne dust concentrations resulting from the processes and activities described in this exposure scenario are given below. The calculated concentrations are time-weighted averages over a full working shift of 8 hours. Thus, they represent worst case long-term occupational exposure to calcium carbonate.</p> <p>An indoor and an outdoor setting is considered for the majority of processes. Local exhaust ventilation (LEV) was only taken into account when the modelled long-term airborne dust or aerosol concentrations exceeded the respective occupational exposure limit (OEL) value. At outdoor sites, natural ventilation was assumed to reduce concentrations in air by 30% (ECETOC default). Personal respiratory equipment (PRE) may be used as an alternative to LEV at indoor sites and will</p>	

be considered as the more likely RMM at outdoor sites. Contact with the pure substance was modelled except for processes involving the handling of slurries or dispersions (PROC 7, 10, 13) where a maximal concentration of 10% solid calcium carbonate in the slurries or dispersions was considered.

Process Category	LEV/ PRE (% efficiency)	Duration (hour)	CaCO <sub>3</sub> conc. (% w/w)	Airborne CaCO <sub>3</sub> conc. (mg/m <sup>3</sup> ) <sup>a)</sup>		RCR inhalation		Conclusion
				IN	OUT	IN	OUT	
<b>Industrial activities with solid calcium carbonate exhibiting high dustiness<sup>b)</sup></b>								
PROC 1	No	4 to 8	100	0.01	0.01	0.003	0.003	Risk controlled
PROC 2	No	4 to 8	100	1	0.7	0.33	0.23	Risk controlled
PROC 3	No	4 to 8	100	1	0.7	0.33	0.23	Risk controlled
PROC 4	No	4 to 8	100	25	17.5	8.33	5.83	RMMs needed to control risk
	90	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 5	No	4 to 8	100	25	17.5	8.33	5.83	RMMs needed to control risk
	90	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 6	No	4 to 8	100	25	17.5	8.33	5.83	RMMs needed to control risk
	90	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 8a	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 8b	No	4 to 8	100	25	17.5	8.33	5.83	RMMs needed to control risk
	90	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 9	No	4 to 8	100	20	14	6.67	4.67	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 13	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 14	No	4 to 8	100	10	7	3.33	2.33	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.333	0.233	Risk controlled
PROC 15	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled

PROC 17	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 18	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 19	No	4 to 8	100	25	17.5	8.33	5.83	RMMs needed to control risk
	90	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 21	No	4 to 8	100	10	7	3.33	2.33	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.333	0.233	Risk controlled
PROC 22	No	4 to 8	100	1	0.7	0.333	0.233	Risk controlled
PROC 23	No	4 to 8	100	1	0.7	0.333	0.233	Risk controlled
PROC 24	No	4 to 8	100	1	0.7	0.333	0.233	Risk controlled
PROC 25	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 26 <sup>c)</sup>	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
<b>Industrial activities with solid calcium carbonate exhibiting medium dustiness<sup>o)</sup></b>								
PROC 1	No	4 to 8	100	0.01	0.01	0.001	0.001	Risk controlled
PROC 2	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 3	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 4	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 5	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 6	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 8a	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 8b	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 9	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled

PROC 14	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 15	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 17	No	4 to 8	100	20	14	2	1.4	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.2	0.14	Risk controlled
PROC 18	No	4 to 8	100	20	14	2	1.4	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.2	0.14	Risk controlled
PROC 19	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 21	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled
PROC 22	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 23	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 24	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 25	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 26 <sup>c)</sup>	No	4 to 8	100	20	14	2	1.4	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.2	0.14	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	20	14	2	1.4	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.2	0.14	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	20	14	2	1.4	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.2	0.14	Risk controlled
<b>Industrial activities with solid calcium carbonate exhibiting low dustiness<sup>d)</sup></b>								
PROC 1	No	4 to 8	100	0.01	0.01	0.001	0.001	Risk controlled
PROC 2	No	4 to 8	100	0.01	0.01	0.001	0.001	Risk controlled
PROC 3	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 4	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 5	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 6	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 8a	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 8b	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 9	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 14	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 15	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 17	No	4 to 8	100	1	0.7	0.01	0.07	Risk controlled



PROC 18	No	4 to 8	100	1	0.7	0.01	0.07	Risk controlled
PROC 19	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 21	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 22	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 23	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 24	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 25	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 26 <sup>c)</sup>	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
<b>Industrial activities with slurries or dispersions containing calcium carbonate<sup>e)</sup></b>								
	No	4 to 8	10	100	70	10	7	RMMs needed to control risk
PROC 7 <sup>f)</sup>	95	4 to 8	10	5	3.75	0.5	0.375	Risk controlled
PROC 10	No	4 to 8	10	0.05	0.04	0.005	0.004	Risk controlled
PROC 12	No	4 to 8	10	5.0	3.75	0.5	0.375	Risk controlled
PROC 13	No	4 to 8	10	0.01	0.01	0.001	0.001	Risk controlled
PROC 19	No	4 to 8	10	0.05	0.05	0.005	0.005	Risk controlled
ALL other PROCs	No	4 to 8	10	0.03	0.02	0.003	0.002	Risk controlled

a) The concentration for each process is given for an indoor and an outdoor scenario.

b) According to the documentation of the TRA tool (ECETOC 2010) the tool returns the respirable dust concentrations for solids characterised by a high dustiness. The existing OEL for respirable dust is 3 mg/m<sup>3</sup>.

c) According to the documentation of the TRA tool (ECETOC 2010), the tool does not calculate exposures for PROCs 26, 27a and 27b. Therefore, the highest exposure estimate from the other categories has been used along with the same RMMs in order to calculate a worst case exposure from this use.

d) According to the documentation of the TRA tool (ECETOC 2010) the tool returns the inhalable dust concentrations for solids characterised by a medium or low dustiness. The existing OEL for inhalable dust is 10 mg/m<sup>3</sup>.

e) The aerosol concentration is interpreted as the inhalable fraction. The existing OEL for inhalable dust is 10 mg/m<sup>3</sup>.

f) Spraying was modelled for a solid substance with fine dustiness.

### Workers (dermal)

Risk characterization for dermal exposure was not assessed, as no risks are anticipated with dermal exposure.

### Indirect exposure via the environment

Calcium carbonate occurs in the natural environment and humans are widely exposed to naturally occurring calcium carbonate, e.g. via drinking water. Calcium carbonate is a food additive approved by the Council Directive 95/2/EC on food additives (the substance has the acronym E 170). It is

expected that emissions of the substance from its identified uses will not significantly increase the concentrations of calcium carbonate in the environment resulting from natural processes. Moreover, the substance does not bio-accumulate. It is concluded that human exposure to anthropogenic calcium carbonate via the environment is not a risk.

**Consumer exposure**

No direct consumer exposure to calcium carbonate will result from the industrial uses.

**5.2. Environmental exposure**

Environmental release	The production of calcium carbonate can potentially result in aquatic emissions and locally increase the concentration of calcium and carbonate ions in the environment. However, any calcium carbonate that is released from human activities and entering the environment will become part of one of the major biogeochemical cycles on Earth, the carbon cycle. It describes the circulation of carbon and chemical components containing carbon through the biosphere from or to the lithosphere, atmosphere and hydrosphere. Calcium carbonate is an ubiquitous mineral in the Earth's upper crust, forming thick layers of sedimentary rocks and being present for example in limestone. Due to weathering, the mineral is released from rocks and transported into surface water or soil. In surface water, it may precipitate and be deposited in sediments or be transported into the ocean as dissolved calcium carbonate, where the calcium carbonate may once again precipitate and form sediments on the ocean's floor.
Waste water treatment plants (WWTP)	Wastewater from manufacture of calcium carbonate is not treated in a biological wastewater treatment plant. No risk for microbiological activity is anticipated with the manufacture of the substance.
Aquatic pelagic compartment	Calcium carbonate is abundant in surface water in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on aquatic ecosystems under natural conditions. Aquatic organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of environmental exposure to calcium carbonate is not needed.
Sediments	Calcium carbonate is abundant in sediments in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on aquatic and sediment ecosystems under natural conditions. Sediment organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of environmental exposure to calcium carbonate is not needed.
Soil and groundwater	Calcium carbonate is abundant in soils in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on terrestrial ecosystems under natural conditions. Terrestrial organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with

	<p>changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of environmental exposure to calcium carbonate is not needed.</p>
Atmospheric compartment	<p>Emissions of calcium carbonate into the atmosphere are low during the manufacture of the substance and waste air is expected to be filtered before released to the environment. The atmospheric concentrations of the substance are expected to be low. No risk is anticipated with the manufacture of the substance.</p>
Secondary poisoning	<p>Aquatic and terrestrial organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Calcium carbonate has no potential for bioaccumulation. Secondary poisoning is not a relevant phenomenon for the substance.</p>

## Summary of Exposure Scenario 2

<b>1. Short title of the exposure scenario 2</b>	
Use of calcium carbonate and mixtures containing calcium carbonate in non-industrial settings - occupational exposure to professionals and exposure to consumers	
<b>2. Description of processes and activities covered by the exposure scenario</b>	
<b>Professionals</b>	
Sector of use (SU)	<ul style="list-style-type: none"> <li>1: Agriculture, forestry, fishery</li> <li>2a: Mining, (without offshore industries)</li> <li>2b: Offshore industries</li> <li>3: Industrial uses: Uses of substances as such or in preparations at industrial sites</li> <li>4: Manufacture of food products</li> <li>5: Manufacture of textiles, leather, fur</li> <li>6a: Manufacture of wood and wood products</li> <li>6b: Manufacture of pulp, paper and paper products</li> <li>7: Printing and reproduction of recorded media</li> <li>8: Manufacture of bulk, large scale chemicals (including petroleum products)</li> <li>9: Manufacture of fine chemicals</li> <li>10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</li> <li>11: Manufacture of rubber products</li> <li>12: Manufacture of plastics products, including compounding and conversion</li> <li>13: Manufacture of plastics products, including compounding and conversion</li> <li>14: Manufacture of basic metals, including alloys</li> <li>15: Manufacture of fabricated metal products, except machinery and equipment</li> <li>16: Manufacture of computer, electronic and optical products, electrical equipment</li> <li>17: General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment</li> <li>18: Manufacture of furniture</li> <li>19: Building and construction work</li> <li>20: Health services</li> <li>23: Electricity, steam, gas water supply and sewage treatment</li> <li>24: Scientific research and development</li> </ul>
Product category (PC)	<ul style="list-style-type: none"> <li>1: Adhesives, sealants</li> <li>2: Adsorbents</li> <li>3: Air care products</li> <li>4: Anti-Freeze and de-icing products</li> <li>7: Base metals and alloys</li> <li>8: Biocidal products (e.g. Disinfectants, pest control)</li> <li>9a: Coatings and paints, thinners, paint removers</li> <li>9b: Fillers, putties, plasters, modelling clay</li> <li>9c: Finger paints</li> <li>11: Explosives</li> <li>12: Fertilisers</li> <li>14: Metal surface treatment products, including galvanic and electroplating products (This covers substances permanently binding with the metal surface)</li> <li>15: Non-metal-surface treatment products (Like for example</li> </ul>

	<p>treatment of walls before painting.)</p> <p>16: Heat transfer fluids</p> <p>17: Hydraulic fluids</p> <p>18: Ink and toners</p> <p>19: Intermediate</p> <p>20: Products such as ph-regulators, flocculants, precipitants, neutralization agents (This category covers processing aids used in the chemical industry)</p> <p>21: Laboratory chemicals</p> <p>23: Leather tanning, dye, finishing, impregnation and care products</p> <p>24: Lubricants, greases, release products</p> <p>25: Metal working fluids</p> <p>26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids</p> <p>27: Plant protection products</p> <p>28: Perfumes, fragrances</p> <p>29: Pharmaceuticals</p> <p>30: Photo-chemicals</p> <p>31: Polishes and wax blends</p> <p>32: Polymer preparations and compounds</p> <p>33: Semiconductors</p> <p>34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids;</p> <p>35: Washing and cleaning products (including solvent based products)</p> <p>36: Water softeners</p> <p>37: Water treatment chemicals</p> <p>38: Welding and soldering products (with flux coatings or flux cores.), flux products</p> <p>39: Cosmetics, personal care products</p> <p>40: Extraction agents</p>
<p>Process category (PROC)</p>	<p>1: Use in closed process, no likelihood of exposure</p> <p>2: Use in closed, continuous process with occasional controlled exposure</p> <p>3: Use in closed batch process (synthesis or formulation)</p> <p>4: Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>10: Roller application or brushing</p> <p>11: Non industrial spraying</p> <p>13: Treatment of articles by dipping and pouring</p> <p>14: Production of preparations or articles by tableting, compression, extrusion, pelletisation</p> <p>15: Use as laboratory reagent</p> <p>17: Lubrication at high energy conditions and in partly open process</p> <p>18: Greasing at high energy conditions</p> <p>19: Hand-mixing with intimate contact and only PPE available</p>

	<p>20: Heat and pressure transfer fluids in dispersive, professional use but closed systems</p> <p>21: Low energy manipulation of substances bound in materials and/or articles</p> <p>22: Potentially closed processing operations with minerals/metals at elevated temperature</p> <p>23: Open processing and transfer operations with minerals/metals at elevated temperature</p> <p>24: High (mechanical) energy work-up of substances bound in materials and/or articles</p> <p>25: Other hot work operations with metals</p> <p>26: Handling of solid inorganic substances at ambient temperature</p> <p>27a: Production of metal powders (hot processes)</p> <p>27b: Production of metal powders (wet processes)</p>
Article category (AC)	<p>1: Vehicles</p> <p>2: Machinery, mechanical appliances, electrical/electronic articles</p> <p>3: Electrical batteries and accumulators</p> <p>4: Stone, plaster, cement, glass and ceramic articles</p> <p>5: Fabrics, textiles and apparel</p> <p>6: Leather articles</p> <p>7: Metal articles</p> <p>8: Paper articles</p> <p>10: Rubber articles</p> <p>11: Wood articles</p> <p>13: Plastic articles</p> <p>31: Scented clothes</p> <p>32: Scented eraser</p> <p>34: Scented Toys</p> <p>35: Scented paper articles</p> <p>36: Scented CD</p> <p>38: Packaging material for metal parts, releasing grease/corrosion inhibitors</p>
Environmental release category (ERC)	<p>1: Manufacture of substances</p> <p>2: Formulation of preparations</p> <p>3: Formulation in materials</p> <p>4: Industrial use of processing aids in processes and products, not becoming part of articles</p> <p>7: Industrial use of substances in closed systems</p> <p>8a: Wide dispersive indoor use of processing aids in open systems</p> <p>8b: Wide dispersive indoor use of reactive substances in open systems</p> <p>8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</p> <p>8d: Wide dispersive outdoor use of processing aids in open systems</p> <p>8e: Wide dispersive outdoor use of reactive substances in open systems</p> <p>8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</p> <p>9a: Wide dispersive indoor use of substances in closed systems</p> <p>9b: Wide dispersive outdoor use of substances in closed systems</p> <p>10a: Wide dispersive outdoor use of long-life articles and</p>

	<p>materials with low release</p> <p>10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing)</p> <p>11a: Wide dispersive indoor use of long-life articles and materials with low release</p> <p>11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)</p>
<b>Consumers</b>	
Product category (PC)	<p>1: Adhesives, sealants</p> <p>2: Adsorbents</p> <p>3: Air care products</p> <p>4: Anti-Freeze and de-icing products</p> <p>7: Base metals and alloys</p> <p>8: Biocidal products (e.g. Disinfectants, pest control)</p> <p>9a: Coatings and paints, thinners, paint removers</p> <p>9b: Fillers, putties, plasters, modelling clay</p> <p>9c: Finger paints</p> <p>11: Explosives</p> <p>12: Fertilisers</p> <p>14: Metal surface treatment products, including galvanic and electroplating products (This covers substances permanently binding with the metal surface)</p> <p>15: Non-metal-surface treatment products (Like for example treatment of walls before painting.)</p> <p>16: Heat transfer fluids</p> <p>17: Hydraulic fluids</p> <p>18: Ink and toners</p> <p>20: Products such as ph-regulators, flocculants, precipitants, neutralization agents (This category covers processing aids used in the chemical industry)</p> <p>21: Laboratory chemicals</p> <p>23: Leather tanning, dye, finishing, impregnation and care products</p> <p>24: Lubricants, greases, release products</p> <p>25: Metal working fluids</p> <p>26: Paper and board dye, finishing and impregnation products: including bleaches and other processing aids</p> <p>27: Plant protection products</p> <p>28: Perfumes, fragrances</p> <p>29: Pharmaceuticals</p> <p>30: Photo-chemicals</p> <p>31: Polishes and wax blends</p> <p>32: Polymer preparations and compounds</p> <p>33: Semiconductors</p> <p>34: Textile dyes, finishing and impregnating products; including bleaches and other processing aids;</p> <p>35: Washing and cleaning products (including solvent based products)</p> <p>36: Water softeners</p> <p>37: Water treatment chemicals</p> <p>38: Welding and soldering products (with flux coatings or flux cores.), flux products</p> <p>39: Cosmetics, personal care products</p> <p>40: Extraction agents</p>

Article category (AC)	<ul style="list-style-type: none"> <li>1: Vehicles</li> <li>2: Machinery, mechanical appliances, electrical/electronic articles</li> <li>3: Electrical batteries and accumulators</li> <li>4: Stone, plaster, cement, glass and ceramic articles</li> <li>5: Fabrics, textiles and apparel</li> <li>6: Leather articles</li> <li>7: Metal articles</li> <li>8: Paper articles</li> <li>10: Rubber articles</li> <li>11: Wood articles</li> <li>13: Plastic articles</li> <li>31: Scented clothes</li> <li>32: Scented eraser</li> <li>34: Scented Toys</li> <li>35: Scented paper articles</li> <li>36: Scented CD</li> <li>38: Packaging material for metal parts, releasing grease/corrosion inhibitors</li> </ul>
Environmental release category (ERC)	<ul style="list-style-type: none"> <li>1: Manufacture of substances</li> <li>2: Formulation of preparations</li> <li>3: Formulation in materials</li> <li>4: Industrial use of processing aids in processes and products, not becoming part of articles</li> <li>7: Industrial use of substances in closed systems</li> <li>8a: Wide dispersive indoor use of processing aids in open systems</li> <li>8b: Wide dispersive indoor use of reactive substances in open systems</li> <li>8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</li> <li>8d: Wide dispersive outdoor use of processing aids in open systems</li> <li>8e: Wide dispersive outdoor use of reactive substances in open systems</li> <li>8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</li> <li>9a: Wide dispersive indoor use of substances in closed systems</li> <li>9b: Wide dispersive outdoor use of substances in closed systems</li> <li>10a: Wide dispersive outdoor use of long-life articles and materials with low release</li> <li>10b: Wide dispersive outdoor use of long-life articles and materials with high or intended release (including abrasive processing)</li> <li>11a: Wide dispersive indoor use of long-life articles and materials with low release</li> <li>11b: Wide dispersive indoor use of long-life articles and materials with high or intended release (including abrasive processing)</li> </ul>
<b>3. Operational conditions</b>	
<b>3.1. Operational conditions related with frequency and quantities of use</b>	
Duration of exposure:	Up to 8 hours per day
Frequency of exposure at workplace:	5 days/week for each worker/ consumer



Annual amount used per site:	The actual amount handled per shift/ use is not considered to influence the exposure as such for this scenario
<b>3.2. Operational conditions related with substance/ product</b>	
Physical state	Solid ranging from a fine powder with high dustiness to coarser granules with low dustiness or a slurry
Concentration of substance in mixture	100% w/w for solid calcium carbonate 10 % w/w for slurries or dispersions containing calcium carbonate
<b>3.3. Other relevant operational conditions</b>	
In principle, only processes and activities where dust may be generated are relevant in this assessment because no calcium carbonate vapours are released during the processes and dermal and oral exposure to calcium carbonate is not harmful to workers. No information about frequency and duration of the various tasks is available.	
<b>4. Risk Management Measures</b>	
<b>4.1 RMMs related to professionals</b>	
Organisational measures	The employer has to ascertain that the required PPE is available and used according to instructions.
Technical measures	Safe conditions may be achieved by ensuring very good ventilation in the workplace
Respiratory protection	For processes with high dust or aerosol formation, the use of respiratory masks is recommended. These processes should be performed in well-vented areas.
Hand protection	Workers use gloves during the handling of the pure, solid substance.
Eye protection	Workers use safety glasses during the handling of the pure, solid substance.
Skin and body protection	Wearing of suitable protective clothing.
Hygiene measures	Standard occupational hygiene measures should be adopted.
<b>4.2. RMMs related to the environment</b>	
Organisational measures	Procedural and/or control technologies are required to minimize emissions and the resulting exposure during cleaning and maintenance procedures.
Abatement measures related to waste air and solid waste.	Solid and liquid waste has to be incinerated or appropriately disposed of as chemical waste.
<b>4.3 Waste related measures</b>	
Type of waste	Solid and liquid waste and packaging material
Disposal technique	Waste can be landfilled when in compliance with local regulations. Containers must be emptied and unused product incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. The empty and clean containers can be reused in conformity with regulations.
<b>5. Prediction of exposure resulting from the conditions described above and the substance properties.</b>	
<b>5.1. Human exposure</b>	
<b>Professional (oral)</b>	
The professional use of calcium carbonate will not notably contribute to the oral intake of calcium carbonate. Good hygiene practice will also minimise oral exposure.	
<b>Professional (inhalation)</b>	
<b>DNEL: Worker, long-term, systemic, inhalation: 10 mg/m<sup>3</sup> for medium and low dustiness solids and 3 mg/m<sup>3</sup> for high dustiness solids</b>	

The occupational exposure to calcium carbonate was modelled by taking into account three grades of solid products exhibiting low, medium and high dustiness.

Occupational inhalation exposure to calcium carbonate was modelled with the ECETOC TRA tool (ECETOC, 2010). The airborne concentrations of calcium carbonate resulting from processes with no significant formation of dusts and aerosols was assessed with the ECETOC TRA tool as well. For calculating the exposure during roller application or brushing, treatment of articles by dipping, pouring and hand mixing of pastes or paints, a solid material exhibiting low dustiness was assumed as recommended in the Targeted Risk Assessment guidance (ECETOC, 2004, Appendix C). The airborne concentration of aerosols occurring during non-industrial spraying of paints or similarly viscous mixtures was modelled by considering a solid substance exhibiting high dustiness (ECETOC, 2004, Appendix C). The molecular weight of the substance of 100.09 g/mol was considered in the calculations.

Short peak concentrations of calcium carbonate may occur in situations where clouds of dust are formed, e.g. in the moment when a transport container is emptied and the dusty product is rushing into the mixing vessel or reactor and in processes where mixing with high-energy agitation occurs in open vessels. These short-term concentrations may exceed the modelled long-term concentrations, but persist for only short duration. It is therefore recommended that respiratory protection is worn in situations with elevated airborne dust or aerosol concentrations.

The long-term airborne dust concentrations of calcium carbonate resulting from the processes and activities described in this exposure scenario are given below. Products with high, medium and low dustiness were differentiated. A number of professional activities involving the use of calcium carbonate exhibiting high dustiness may lead to airborne dust concentrations that exceed the occupational exposure limits of 3 mg/m<sup>3</sup> for respirable particles (taken into account for the handling of powdery solids with high dustiness) and 10 mg/m<sup>3</sup> for inhalable particles (taken into account for the handling of solids with medium or low dustiness and aerosols). Professionals may use calcium carbonate outdoors, for example for the conditioning of soils. Therefore, an outdoor scenario was considered for all processes described in the exposure scenario.

The use of local exhaust ventilation with a sufficient efficiency ensures that the OEL values are respected for all uses. Alternatively, workers may use breathing masks with a sufficient filtering capacity or the duration of the activities may be reduced: the default factors for reduction of concentrations in the TRA tool are 0.6 for durations of 1 to 4 hours, 0.2 for durations of 15 minutes to 1 hour and 0.1 for durations less than 15 minutes. It may also be useful to consider the concentration of the substance in the mixtures used by professionals as the airborne concentrations will decrease with decreasing concentrations.

The spraying of slurries or dispersions containing up to 10% w/w calcium carbonate was investigated in the exposure modelling. Non-industrial spraying may result in high airborne aerosol concentrations according to the TRA tool.

Process Category	LEV/ PRE (% efficiency)	Duration (hours)	CaCO <sub>3</sub> conc. (% w/w)	Airborne CaCO <sub>3</sub> conc. (mg/m <sup>3</sup> ) <sup>a)</sup>		RCR inhalation		Conclusion
				IN	OUT	IN	OUT	
<b>Professional activities with solid calcium carbonate exhibiting high dustiness<sup>b)</sup></b>								
PROC 1	No	4 to 8	100	0.1	0.07	0.033	0.023	Risk controlled
PROC 2	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 3								
	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to

								control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 4	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 5	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 8a	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 8b	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 9	No	4 to 8	100	20	14	6.67	4.67	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 13	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 14	No	4 to 8	100	50	37.5	16.7	12.5	RMMs needed to control risk
	95	4 to 8	100	2.5	1.75	0.833	0.583	Risk controlled
PROC 15	No	4 to 8	100	5	3.75	1.67	1.25	RMMs needed to control risk
	90	4 to 8	100	0.5	0.38	0.167	0.125	Risk controlled
PROC 17	No	4 to 8	100	200	140	66.7	46.7	RMMs needed to control risk
	99	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 18	No	4 to 8	100	200	140	66.7	46.7	RMMs needed to control risk
	99	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 19	No	4 to 8	100	50	3.75	16.7	1.25	RMMs needed to control risk
	95	4 to 8	100	2.5	0.38	0.833	0.125	Risk controlled
PROC 21	No	4 to 8	100	20	14	6.67	4.67	RMMs needed to control risk
	90	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 23								
	No	4 to 8	100	3	2.1	1	0.7	RMMs needed to

								control risk
	90	4 to 8	100	0.3	0.21	0.1	0.07	Risk controlled
PROC 24	No	4 to 8	100	3	2.1	1	0.7	RMMs needed to control risk
	90	4 to 8	100	0.3	0.21	0.1	0.07	Risk controlled
PROC 25	No	4 to 8	100	10	7	3.33	2.33	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.33	0.233	Risk controlled
PROC 26 <sup>c)</sup>	No	4 to 8	100	200	140	66.7	46.7	RMMs needed to control risk
	99	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	200	140	66.7	46.7	RMMs needed to control risk
	99	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	200	140	66.7	46.7	RMMs needed to control risk
	99	4 to 8	100	2	1.4	0.667	0.467	Risk controlled
<b>Professional activities with solid calcium carbonate exhibiting medium dustiness <sup>d)</sup></b>								
PROC 1	No	4 to 8	100	0.01	0.007	0.001	0.0007	Risk controlled
PROC 2	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 3	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 4	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 5	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 8a	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 8b	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 9	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 14	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 15	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 17	No	4 to 8	100	50	37.5	5	3.75	RMMs needed to control risk
	90	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 18	No	4 to 8	100	50	37.5	5	3.75	RMMs needed to control risk
	90	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 19	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 21	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 23	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled

PROC 24	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled
PROC 25	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 26 <sup>c)</sup>	No	4 to 8	100	50	37.5	5	3.75	RMMs needed to control risk
	90	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	50	37.5	5	3.75	RMMs needed to control risk
	90	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	50	37.5	5	3.75	RMMs needed to control risk
	90	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
<b>Professional activities with solid calcium carbonate exhibiting low dustiness <sup>d)</sup></b>								
PROC 1	No	4 to 8	100	0.01	0.007	0.001	0.0007	Risk controlled
PROC 2	No	4 to 8	100	0.01	0.007	0.001	0.0007	Risk controlled
PROC 3	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 4	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 5	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 8a	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 8b	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 9	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 14	No	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 15	No	4 to 8	100	0.1	0.07	0.01	0.007	Risk controlled
PROC 17	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 18	No	4 to 8	100	5	3.75	0.5	0.375	Risk controlled
PROC 19	No	4 to 8	100	0.5	0.38	0.05	0.038	Risk controlled
PROC 21	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled
PROC 23	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled
PROC 24	No	4 to 8	100	3	2.1	0.3	0.21	Risk controlled
PROC 25	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk

PROC 26 <sup>c)</sup>

	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 27a <sup>c)</sup>	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
PROC 27b <sup>c)</sup>	No	4 to 8	100	10	7	1	0.7	RMMs needed to control risk
	90	4 to 8	100	1	0.7	0.1	0.07	Risk controlled
<b>Professional activities with liquid mixtures containing calcium carbonate<sup>e)</sup></b>								
PROC 10	No	4 to 8	10	0.05	0.038	0.05	0.0038	Risk controlled
PROC 11 <sup>f)</sup>	No	4 to 8	10	250.2	175.1	25.02	17.51	RMMs needed to control risk
	97.5	4 to 8	10	6.3	4.4	0.63	0.44	Risk controlled
PROC 13	No	4 to 8	10	0.05	0.038	0.005	0.0038	Risk controlled
PROC 19	No	4 to 8	10	0.05	0.038	0.005	0.0038	Risk controlled
All other PROCs	No	4 to 8	10	0.03	0.02	0.003	0.002	Risk controlled

a) The concentration for each process is given for an indoor and an outdoor scenario.

b) According to the documentation of the TRA tool (ECETOC 2010) the tool returns the respirable dust concentrations for solids characterised by a high dustiness. The existing OEL for respirable dust is 3 mg/m<sup>3</sup>.

c) According to the documentation of the TRA tool (ECETOC 2010), the tool does not calculate exposures for PROCs 26, 27a and 27b. Therefore, the highest exposure estimate from the other categories has been used along with the same RMMs in order to calculate a worst case exposure from this use.

d) According to the documentation of the TRA tool (ECETOC 2010) the tool returns the inhalable dust concentrations for solids characterised by a medium or low dustiness. The existing OEL for inhalable dust is 10 mg/m<sup>3</sup>.

e) The aerosol concentration is interpreted as the inhalable fraction. The existing OEL for inhalable dust is 10 mg/m<sup>3</sup>.

f) Spraying was modelled for a solid substance with fine dustiness.

### Professional (dermal)

Risk characterization for dermal exposure was not assessed, as no risks are anticipated with dermal exposure.

### Indirect exposure via the environment

Calcium carbonate occurs in the natural environment and humans are widely exposed to naturally occurring calcium carbonate, e.g. via drinking water. Calcium carbonate is a food additive approved by the Council Directive 95/2/EC on food additives (the substance has the acronym E 170). It is expected that emissions of the substance from its identified uses will not significantly increase the concentrations of calcium carbonate in the environment resulting from natural processes. Moreover, the substance does not bio-accumulate. It is concluded that human exposure to anthropogenic calcium carbonate via the environment is not a risk.

### Consumer exposure

## Consumer (inhalation)

### **DNEL: Consumer, long-term, systemic, inhalation: 10 mg/m<sup>3</sup> for medium and low dustiness solids**

As the conditions of consumer exposure may deviate significantly from those of professional exposure, it is useful to assess consumer exposure occurring during certain activities separately.

#### **Inhalation exposure during loading and mixing of powdery products:**

An inventory compiled by Van Hemmen (1992) for the inhalation exposure of professionals to pesticides gives an indicative value for mixing and loading of solid pesticides (wetttable powders). The 90th percentile value of the inhalation exposure is 15 mg formulation per hour, which is applicable for an amount of 25 kg active substance applied per day. The indicative value for professional exposure to pesticides is extrapolated to the consumer use of pesticides in the Pest Control Products Fact Sheet (RIVM 2006). Subsequently, it has been assumed that the indicative value found for a powdery pesticide product may be also appropriate for do-it-yourself products (RIVM 2007). In the Do-It-Yourself Products Fact Sheet (RIVM 2007), it is assumed that the quantity of active substance applied per day is 1000 times lower for consumer than for professional products; thus, the amount applied per day is circa 25 g of active substance.

The inhalation exposure of consumers to airborne dusts of the products is estimated at 0.015 mg/hour. This is reasonable for relatively low product amounts. For tasks involving the use of larger amounts of product the inhalation exposure is expected to be higher. A factor of 10 is suggested when the product amount exceeds 2.5 kg, resulting in an inhalation exposure of 0.15 mg/hour.

Inhalation exposure to calcium carbonate dusts may for example occur when consumers work with cements and plasters, fertilisers and soil conditioners or water treatment chemicals. A product amount exceeding 2.5 kg/day (an inhalation exposure of 0.15 mg/hour), an exposure duration of 30 minutes per day and an inhalation rate of 26 m<sup>3</sup>/day for light exercise result in a reasonable worst-case airborne dust concentration of  $0.15 / (0.5 / 24 \times 26) = 0.277 \text{ mg/m}^3$ .

Therefore, comparing the exposure value to the inhalation DNEL of 10 mg/m<sup>3</sup>, gives a **RCR of 0.028** and demonstrates that this use of calcium carbonate is safe for consumers.

The inhalation exposure of consumers to calcium carbonate resulting from the use of powdery abrasives was modelled with the ConsExpo tool by using the default exposure scenarios implemented in the tool (RIVM 2006b). A worst case weight fraction of calcium carbonate in the products of 25% w/w was considered. The mean event concentration was 0.0102 mg/m<sup>3</sup> during cleaning.

Therefore, comparing the exposure value to the inhalation DNEL of 10 mg/m<sup>3</sup>, gives a **RCR of 0.001** and demonstrates that this use of calcium carbonate is safe for consumers.

#### **Inhalation exposure during use of liquid and viscous mixtures by rolling and brushing:**

The inhalation exposure of consumers to calcium carbonate resulting from the use of paints and liquid abrasives by rolling and brushing was modelled with the ConsExpo tool by using the default exposure scenarios implemented in the tool (RIVM 2006b). A worst case weight fraction of calcium carbonate in the products of 25% w/w was considered. The mean event concentration was  $1.15 \times 10^{-4} \text{ mg/m}^3$  during painting and  $5.25 \times 10^{-5} \text{ mg/m}^3$  during use of liquid abrasive.

Therefore, comparing these exposure values to the inhalation DNEL of 10 mg/m<sup>3</sup>, gives **RCRs of  $1.15 \times 10^{-5}$  and  $5.25 \times 10^{-6}$** , respectively and demonstrates that the use of calcium carbonate during painting and the use of liquid abrasive is safe for consumers.

#### **Inhalation exposure during use of liquid and viscous mixtures by spraying:**

The inhalation exposure of consumers to calcium carbonate resulting from the use of spray paints was modelled with the ConsExpo tool by using the default exposure scenario implemented in the

tool (RIVM 2006b). The substance is added to paints and other liquid or viscous mixtures as ground calcium carbonate. It is assumed that solid calcium carbonate particles released during spraying may form inhalable airborne dust. The average daily airborne concentration of calcium carbonate depends on the concentration of the substance in the spray paint. The RCR values calculated using the average daily airborne concentration of calcium carbonate and the inhalation DNEL of 10 mg/m<sup>3</sup> are shown below:

**Mean event airborne concentration of calcium carbonate during use of spray paints**

Concentration of substance in spray paint	Mean airborne concentration of substance on day of exposure (mg/m <sup>3</sup> )	RCR
25% w/w	1.3	0.13
20% w/w	1.04	0.104
15% w/w	0.781	0.078
10% w/w	0.521	0.052
5% w/w	0.26	0.026

These RCR demonstrate that the use of calcium carbonate during spraying is safe for consumers.

**Inhalation exposure from use articles:**

No consumer exposure to calcium carbonate via the inhalation route is anticipated with the use of articles containing the substance.

**5.2. Environmental exposure**

Environmental release	The production of calcium carbonate can potentially result in aquatic emissions and locally increase the concentration of calcium and carbonate ions in the environment. However, any calcium carbonate that is released from human activities and entering the environment will become part of one of the major biogeochemical cycles on Earth, the carbon cycle. It describes the circulation of carbon and chemical components containing carbon through the biosphere from or to the lithosphere, atmosphere and hydrosphere. Calcium carbonate is an ubiquitous mineral in the Earth's upper crust, forming thick layers of sedimentary rocks and being present for example in limestone. Due to weathering, the mineral is released from rocks and transported into surface water or soil. In surface water, it may precipitate and be deposited in sediments or be transported into the ocean as dissolved calcium carbonate, where the calcium carbonate may once again precipitate and form sediments on the ocean's floor.
Waste water treatment plants (WWTP)	Wastewater from manufacture of calcium carbonate is not treated in a biological wastewater treatment plant. No risk for microbiological activity is anticipated with the manufacture of the substance.
Aquatic pelagic compartment	Calcium carbonate is abundant in surface water in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on aquatic ecosystems under natural conditions. Aquatic organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of



	environmental exposure to calcium carbonate is not needed.
Sediments	Calcium carbonate is abundant in sediments in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on aquatic and sediment ecosystems under natural conditions. Sediment organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of environmental exposure to calcium carbonate is not needed.
Soil and groundwater	Calcium carbonate is abundant in soils in varying concentrations depending on the environmental conditions and natural processes. There are no hints that the substance may exhibit adverse effects on terrestrial ecosystems under natural conditions. Terrestrial organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Environmental emissions of calcium carbonate from human activities may cause short-term alterations in the environmental conditions on a local scale, but it is unlikely that they may influence the environment on a larger regional scale. It is concluded that emissions of calcium carbonate from human activities do not pose environmental risks and that a detailed assessment of environmental exposure to calcium carbonate is not needed.
Atmospheric compartment	Emissions of calcium carbonate into the atmosphere are low during the manufacture of the substance and waste air is expected to be filtered before released to the environment. The atmospheric concentrations of the substance are expected to be low. No risk is anticipated with the manufacture of the substance.
Secondary poisoning	Aquatic and terrestrial organisms are able to actively regulate the levels of calcium and carbonate in their bodies and can cope with changes in the environmental levels of calcium carbonate. Calcium carbonate has no potential for bioaccumulation. Secondary poisoning is not a relevant phenomenon for the substance.