



## Safety Data Sheet

Pursuant to Act No. 67/2010 Coll. and Regulation (EC) No 1907/2006 of the European Parliament and of the Council (REACH) as amended

Revision: 10 March 2025, version no. 14 replaces all previous versions.

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product identifier

General purpose cements according to EN 197-1.

| List of products         |                                         |                          |
|--------------------------|-----------------------------------------|--------------------------|
| CEM I 42,5 R             | Portland cement EN 197-1                | UFI: 2200-U0CW-500E-QU85 |
| CEM I 52,5 N             | Portland cement EN 197-1                | UFI: 2200-U0CW-500E-QU85 |
| CEM II/A-S 42,5 R        | Portland slag cement EN 197-1           | UFI: 1500-C029-F00X-D5UV |
| CEM II/A-S 52,5 N        | Portland slag cement EN 197-1           | UFI: 1500-C029-F00X-D5UV |
| CEM II/B-S 42,5 N        | Portland slag cement EN 197-1           | UFI: 1500-C029-F00X-D5UV |
| CEM II/B-M (S-L) 32,5 R  | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/B-M (S-LL) 32,5 R | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/B-M (S-L) 32,5 N  | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/B-M (S-LL) 32,5 N | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/B-M (S-L) 42,5 N  | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/B-M (S-LL) 42,5 N | Portland composite cement EN 197-1      | UFI: 0P00-D06P-900W-C7CS |
| CEM II/A - LL 42,5 R     | Portland cement with limestone EN 197-1 | UFI: YK00-V0H9-000D-PVSN |
| CEM III/A 32,5 N         | Blast-furnace mixed cement EN 197-1     | UFI: 1500-C029-F00X-D5UV |
| CEM VI (S-LL) 42,5 N     | Composite cement EN 197-5               | UFI: 0P00-D06P-900W-C7CS |
| CEM VI (S-LL) 32,5 R     | Composite cement EN 197-5               | UFI: 0P00-D06P-900W-C7CS |
| CEM VI (S-LL) 32,5 N     | Composite cement EN 197-5               | UFI: 0P00-D06P-900W-C7CS |

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

Cements are used in industrial facilities for production/manufacturing of hydraulic binders in the building industry and for building works, such as concrete, mortars, plasters, grouts, as well as concrete prefabricated components. General purpose cements and mixtures containing cement (hydraulic binders) are used in the industry by both professional users and consumers in the building industry and for internal and external building works. Determined use of cements and cement mixtures include dry products and wet products (suspensions, plastics).

| PROC | Determined use - process category                                                                                                            | Production /<br>manufacture                        | Professional<br>/industrial<br>use |
|------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------|
|      |                                                                                                                                              | in the building industry<br>and building materials |                                    |
| 2    | Using during the non-stop closed production process with occasionally controlled exposure (e.g. sampling)                                    | x                                                  | x                                  |
| 3    | Using during the closed batched production process (synthesis or formulation)                                                                | x                                                  | x                                  |
| 5    | Mixing or blending in the batched production processes during formulation of preparations and items (more stages and/or significant contact) | x                                                  | x                                  |
| 7    | Spraying techniques in the industrial devices and applications                                                                               |                                                    | x                                  |
| 8a   | Transport of substance or preparation (filling up / emptying) containers/huge containers in non-specific facilities                          |                                                    | x                                  |
| 8b   | Transport of substance or preparation (filling up / emptying) containers/huge containers in specific facilities                              | x                                                  | x                                  |
| 9    | Transport of substance or preparation into small containers (special filling machine, incl. weighing out)                                    | x                                                  | x                                  |
| 10   | Application of glues and other surface materials by roller or brush                                                                          |                                                    | x                                  |
| 11   | Spraying techniques out of the industrial devices and applications                                                                           |                                                    | x                                  |
| 13   | Treatment of items by soaking and pouring                                                                                                    |                                                    | x                                  |
| 14   | Production of preparations or items by pressing pills, compression, pushing, pelletizing                                                     | x                                                  | x                                  |
| 19   | Manual mixing during which happens direct contact with substance; only personal protective aids are available                                |                                                    | x                                  |
| 22   | Potentially closed manufacturing processing with minerals / metals at increased temperature                                                  |                                                    | x                                  |
| 26   | Handling with solid inorganic substances at ambient temperature                                                                              | x                                                  | x                                  |

### 1.3 Detailed data of the Material Safety Datasheet supplier

|                                                                                    |                                                    |
|------------------------------------------------------------------------------------|----------------------------------------------------|
| <b>Business name of the company:</b>                                               | Považská cementáreň, a. s.                         |
| <b>Address:</b>                                                                    | Ul. J. Kráľa<br>018 63 Ladce, Slovak Republic      |
| <b>BIN:</b>                                                                        | 31615716                                           |
| <b>Tel.:</b>                                                                       | +421 42 460 31 11                                  |
| <b>Fax:</b>                                                                        | +421 42 460 33 86                                  |
| <b>Email:</b>                                                                      | <a href="mailto:pcla@pcla.sk">pcla@pcla.sk</a>     |
| <b>E-mail address of the person responsible for the Material Safety Datasheet:</b> | <a href="mailto:tido.i@pcla.sk">tido.i@pcla.sk</a> |

### 1.4 Emergency phone number:

|                                                                                              |                   |
|----------------------------------------------------------------------------------------------|-------------------|
| <b>Phone number in case of emergencies:</b><br>(Toxicology Information Centre in Bratislava) | +421 2 547 4166   |
| <b>Working hours:</b>                                                                        | 24 hours / 7 days |
| <b>Services are provided in the following language:</b>                                      | Slovak            |

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### 2.1.1 According to the Regulation (EC) No. 1272/2008

| Hazard class                                                                          | Hazard category | Classification procedure       |
|---------------------------------------------------------------------------------------|-----------------|--------------------------------|
| Skin Irrit. 2                                                                         | 2               | Based upon data from tests     |
| Eye Dam. 1                                                                            | 1               | Based upon data from tests     |
| Skin Sens. 1B                                                                         | 1 B             | Based upon literature research |
| Toxic to specific target organs – single exposure. Respiratory irritation (STOT SE 3) | 3               | Based upon literature research |

### Hazard statements

H318 Causes serious eye damage.


H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H335 May cause respiratory irritation.

### 2.2. Label elements

#### 2.2.1. According to the Regulation (EC) No. 1272/2008

|                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GHS Pictograms:</b>                |                                                                                                                                                                                                                                                                                   |
| <b>Signal word:</b>                   | Danger                                                                                                                                                                                                                                                                                                                                                               |
| <b>Hazard-determining components:</b> | Portland clinker, dust from the production of Portland clinker                                                                                                                                                                                                                                                                                                       |
| <b>Hazard Statements:</b>             | <b>H318</b> Causes serious eye damage.<br><b>H315</b> Causes skin irritation.<br><b>H317</b> May cause an allergic skin reaction.<br><b>H335</b> May cause respiratory irritation.                                                                                                                                                                                   |
| <b>Precautionary Statements:</b>      | <b>P102</b> Keep out of reach of children.<br><b>P280</b> Wear protective gloves/protective clothing/eye protection/face protection.<br><b>P305 + P351 + P338 + P310</b> IF IN EYES: Rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call Toxicology Information Centre, Bratislava or doctor. |

**P302 + P352 + P333 + P313** IF ON SKIN: Wash with plenty of water and soap. If skin irritation or rash occurs: Seek medical advice/attention.  
**P261 + P304 + P340 + P312** Avoid breathing dust. IF INHALED: Provide fresh air and keep at rest in a position comfortable for breathing. If not feeling well, call Toxicology Information Centre, Bratislava or doctor.  
**P501** Dispose of contents/container to ... according to local / regional regulations.

### Additional information

Contact with wet cement, fresh concrete or mortar with skin may cause irritation, dermatitis or acid burning.

May cause damage to products made of aluminium or other non-noble metals.

### 2.3. Other hazards

Cements do not satisfy criteria for PTB or vPvB in accordance with Annex XIII of the REACH document (Regulation (EC) No 1907/2006)

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Not applicable.

### 3.2 Mixtures

General purpose cement in terms of EN 197-1, cement in accordance with EN 197-5 and special purpose cement according to ÖNORM B 3327-1 and DIN 1164.

#### Hazardous substances:

| Name                                        | Portland cement clinker                                   | Dust from the production of Portland clinker              |
|---------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| EC No.                                      | 266-043-4                                                 | 270-659-9                                                 |
| CAS No.                                     | 65997-15-1                                                | 68475-76-3                                                |
| Registration number                         | Not assigned                                              | 01-2119486767-17-xxxx                                     |
| Concentration range (% w/w)                 | 5 - 100                                                   | According to internal regulations                         |
| Classification according to CLP (1272/2008) | <br>Danger                                                | <br>Danger                                                |
| Hazard classes and hazard categories        | Eye Dam. 1<br>Skin Sens. 1B<br>Skin Irrit. 2<br>STOT SE 3 | Eye Dam. 1<br>Skin Sens. 1B<br>Skin Irrit. 2<br>STOT SE 3 |
| H-statements                                | H315, H317, H318, H335                                    | H315, H317, H318, H335                                    |

**Other substances:**

| Name                                        | Blast furnace slag              | Calcium sulphate                | Limestone                       |
|---------------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| EC No.                                      | 266-002-0                       | 7778-18-9                       | 215-279-6                       |
| CAS No.                                     | 65996-69-2                      | 231-900-3                       | 1317-65-3                       |
| Registration number                         | 01-2119487456-25-xxxx           | 01-2119444918-26-xxxx           | Exempted, Annex IV, REACH       |
| Concentration range (% w/w)                 | According to EN 197-1, EN 197-5 | According to EN 197-1, EN 197-5 | According to EN 197-1, EN 197-5 |
| Classification according to CLP (1272/2008) | -                               | -                               | -                               |
| Hazard classes and hazard categories        | -                               | -                               | -                               |
| H-statements                                | -                               | -                               | -                               |

## SECTION 4: First-aid measures

### 4.1 Description of first-aid measures

#### General information

First-aid providers do not need to use any protective aids. First-aid employees should avoid contact with wet cement or mixtures containing cement.

#### After eye contact

Do not rub your eyes so that you will not damage cornea mechanically. Remove contact lenses if you use them. Tilt head to the side of the affected eye, open eyelids wide and carefully rinse the eye (eyes) with plenty of water for the period of 20 minutes at least in order to remove any particles. Prevent from fouling up the unaffected eye with particles. If possible, use isotonic water (0.9% NaCl), visit a specialist for professional diseases or specialized optician.

#### After skin contact

Remove dry cement and rinse with plenty of water. In case of wet/damp cement wash the skin with plenty of water. Remove the contaminated clothes, shoes, watches, etc. and carefully clean them before their next use. In case of any irritation or burning seek medical attention.

#### After inhaling

Provide fresh air. Dust (cement) from throat (neck) and nasal cavity should be released spontaneously. If it persists or irritation appears lately or nausea, cough or other symptoms persist, seek medical attention.

#### After swallowing

Do not induce vomiting. If the person is conscious, rinse his/her mouth with water and let him/her drink plenty of water. Immediately seek medical attention or contact Toxicology Information Centre, Bratislava.

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

**Eyes:** Contact of eyes with cement (dry or wet) may cause serious and potentially irreversible injury.

**Skin:** Cement may have irritation effects to wet skin (owing to sweating or soaking) after further contact or it may cause contact dermatitis after repeated contact. Further contact of skin with wet cement or concrete may cause serious burning (acid burning), because it is developed with initial absence of pain (e.g. kneeling in wet concrete, even though the clothes). For more details see (reference 1).

**Inhaling:** Long-term repeated inhaling of general purpose cement increases risk of respiratory diseases development.

**Environment:** General purpose cements are not dangerous for environment when using normally.

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

When seeing a doctor, take this SDS with you.

## **SECTION 5: Fire-fighting measures**

### **5.1 Extinguishing media**

General purpose cements are not flammable.

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

Cements are not flammable / combustible and do not enable, nor support burning of other materials.

### **5.3 Advice for fire-fighters**

Cements do not cause any fire-related hazard. Fire-fighters do not need any special protective equipment.

## **SECTION 6: Accidental release measures**

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

#### **6.1.1 For non-emergency employees**

Wear protective aids as it is described in Section 8 and keep instructions for safe handling and using specified in Section 7.

#### **6.1.2 For emergency employees**

Emergency procedures are not required. However, the protection of airways is necessary in cases of high levels of dustiness. For more details see Section 7.1.2

## **6.2 Environmental precautions**

Do not release cement into sewage and drainage systems or water areas (e.g. watercourses).

## **6.3 Methods and material for containment and cleaning up**

Gather the spilled dry material and use if it is not polluted or spoiled.

### **Dry cement**

Use dry methods of disposal, such as cleaning by suction or vacuuming (industrial mobile units equipped with high-efficiency air-filters towards particles (EPA and HEPA filters, EN 1822 - 1: 2009) or similar equipment) which reduces dust emissions into air and do not cause dispersion/dusting. Never use compressed air.

Wet cleaning is possible (water spray, fine water mist), avoid increase of dust, swipe the dust and remove the newly-emerged sediments (see wet cement). During wet cleaning vacuuming and brushing is not possible, ensure so that employees were wearing adequate protective aids and avoid dust dispersion.

Avoid inhaling cement and contact with skin. Gather the spilled material into containers and use it. Let it solidify before its disposal, as described in Section 13.

### **Wet cement**

Place wet cement into container during cleaning. Let the material dry and solidify before its disposal, as it is described in Section 13.

## **6.4 Reference to other sections**

For more details see Sections 8 and 13.

# **SECTION 7: Handling and storage**

## **7.1 Precautions for safe handling**

### **7.1.1 Protective measures**

Follow the recommendations given in Section 8. See the disposal of dry cement in Chapter 6.3.

### **Measures to avoid fire**

Not used.

### **Measures to avoid the appearance of aerosols and dust**

Do not sweep. Using dry methods of removal, such as removal by vacuuming or suction, which reduces the emissions of dust into air.

### **Measures to protect environment**

No specific measures.

### **7.1.2 Information on general hygiene at work**

Do not handle the materials or store them near food or drinks or smoking accessories. Wear a dust mask or a respirator and protective glasses in dusty environment.

Wear protective gloves to avoid contact with skin.



## **7.2 Conditions for safe storage, including any incompatibilities**

- Loose cement should be stored in silos which are watertight, dry (i.e. with minimized internal condensation), clean and protected against pollution. Risk of drowning: Cement may accumulate on walls of the closed spaces or stick to them. Cement may unexpectedly loosen, collapse or fall down. Do not enter closed spaces such as silos, reservoirs, trucks for the transport of loose materials or other storing containers or vessels in which cements are stored or which contain cements because of the risk of drowning or suffocation, although you have adopted appropriate safety measures.
- Do not use aluminium packages owing to material incompatibility.
- Packed products should be stored in original and well closed bags, in cool and dry place, protected against pollution to avoid the loss of quality.
- Bags should be stored (layered) in a constant way.

## **7.3 Specific end use(s)**

Not required any other information for specific end use (see point 1.2.).

## **7.4 Control of content of soluble Cr(VI)**

According to regulations specified in Section 15, the effectiveness of the reduction agent is lowered with time in cements treated by reduction agent Cr(VI). That is why cement bags and/or delivery documentation must contain information about the date of packing, storage conditions and storage period during which the activity of the reduction agent is kept, and the content of hexavalent chrome is kept under 0.0002 % in the total weight of cement, in accordance with EN196-10. Specified storage conditions must be specified in order to keep the efficiency of the reduction agent.

# **SECTION 8. Exposure controls and personal protection**

## **8.1 Control parameters**

DNEL inhaling (8h): 3 mg/m<sup>3</sup>

DNEL dermal: not applied

DNEL oral: not relevant

DNEL values are related to respirable dust, whereas exposure estimates for MEASE tool reflect inhaling fraction. That is why next safety reserve is inseparable part of risk control assessment and derived risk control measures. There is no DNEL value for cements for dermal exposures for employees, not even from safety studies or human practice. Dermal exposure must be lowered up to the technically feasible minimum because cements are classified as skin and eye irritants.

PNEC water environment: not applied

PNEC sediment: not applied

PNEC soil environment: not applied

Assessment of exposure into water environment is based upon possible pH changes. Determination of exposure is carried out by the assessment of the final pH impact. The pH value of surface water, underground water and sewage water should not exceed value 9.

| Name                   | Limit value                        | Exposure limit value                               | Exposure intensity                         | Legal reference              |
|------------------------|------------------------------------|----------------------------------------------------|--------------------------------------------|------------------------------|
| <b>Portland cement</b> | OEL total inhaled dust             | 5 (E) mg/m <sup>3</sup>                            | Limit value of working environment         | TRGS 900 (17)                |
| <b>Cement</b>          | OEL inhaled dust<br>OEL lung share | 10 (E) mg/m <sup>3</sup><br>3(A) mg/m <sup>3</sup> |                                            |                              |
| <b>Cement</b>          | Soluble Cr(VI) (dermal exposure)   | 2 ppm                                              | short-term (acute)<br>long-term (repeated) | Regulation (EC) No 1907/2006 |

## 8.2 Exposure controls

### 8.2.1 Adequate technical provision

Measures to eliminate dust and avoid dust spread in the environment, such as dust removal, suction ventilation and dry methods of removal which do not cause dispersion in air.

| Exposure scenario                                                                          | PROC*                   | Exposure                                                               | Local control / local measures                                  | Effectiveness |
|--------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------|---------------|
| Industrial production of hydraulic building and construction materials                     | 2.3                     | Length is not limited (up to 480 minutes per shift, 5 shifts per week) | not required                                                    | -             |
|                                                                                            | 14, 26                  |                                                                        | A) not required<br>or<br>B) common local extraction             | -<br>78%      |
|                                                                                            | 5, 8b, 9                |                                                                        | A) full / total ventilation<br>or<br>B) common local extraction | 17%<br>78%    |
| Industrial use of dry hydraulic building and construction materials (internal, external)   | 2                       |                                                                        | not required                                                    | -             |
|                                                                                            | 14, 22, 26              |                                                                        | A) not required<br>or<br>B) common local extraction             | -<br>78%      |
|                                                                                            | 5, 8b, 9                |                                                                        | A) full / total ventilation<br>or<br>B) common local extraction | 17%<br>78%    |
| Industrial use of wet suspensions of hydraulic building and construction materials         | 7                       |                                                                        | A) not required<br>or<br>B) common local extraction             | -<br>78%      |
|                                                                                            | 2, 5, 8b, 9, 10, 13, 14 |                                                                        | not required                                                    | -             |
| Professional use of dry hydraulic building and construction materials (internal, external) | 2                       |                                                                        | not required                                                    | -             |
|                                                                                            | 9, 26                   |                                                                        | A) not required<br>or<br>B) common local                        | -<br>72%      |




|                                                                                      |                                 |  |                                                                                  |              |
|--------------------------------------------------------------------------------------|---------------------------------|--|----------------------------------------------------------------------------------|--------------|
|                                                                                      |                                 |  | extraction                                                                       |              |
|                                                                                      | 5, 8a, 8b, 14                   |  | A) not required<br>or<br>B) integrated local ventilation                         | -<br><br>87% |
|                                                                                      | 19                              |  | Local measures are not applicable, only in well air-conditioned rooms or outside | 50%          |
| Professional use of wet suspensions of hydraulic building and construction materials | 11                              |  | A) not required<br>or<br>B) common local extraction                              | -<br><br>72% |
|                                                                                      | 2, 5, 8a, 8b, 9, 10, 13, 14, 19 |  | not required                                                                     | -            |

\*PROC are determined uses and defined in point 1.2.

#### 8.2.2 Individual protective measures such as protective aids

##### General

Avoid kneeling in wet mortar or concrete at work, if possible. If kneeling cannot be avoided, use appropriate waterproof personal protective aids. Do not eat, drink or smoke during the work with cement, you will avoid contact with skin and mouth. Before starting the work with cement use a protection cream and use it in regular intervals repeatedly. After finishing the work with cement or materials containing cement it is necessary for employees to have a shower or use skin moisturizing preparations. Remove the contaminated clothes, shoes, watches, etc. and carefully clean them before their next use.

| Eye and face protection                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                      | Do not wear your contact lenses. During manipulation with dry or wet cement wear the approved glasses or protective glasses according to EN 166 in order to avoid contact with the eyes.                                                                                                                                                                                                                                                                                                                                                                                           |
| Skin protection                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|   | Wear waterproof gloves resistant to abrasion and alkalis (made of material with small content of soluble CR(VI), cotton inside, high boots, clothes with closed sleeves and trousers, as well as skin protective aids (including protective creams) in order to protect the skin against long-term contact with wet dusts. Especially important is to prevent shoes from being in contact with wet cement from inside. When contact cannot be avoided, e.g. in case of laying / application of concrete mixture or coating, use waterproof resistant trousers and knee-protection. |
| Respiratory protection                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



If there are potentially higher levels of dust than exposure limits, use airways protection. The protection should be adjusted / adapted to the dust level and should satisfy the corresponding EN standard (e.g. EN 149, EN140, EN14387, EN1827) or be in accordance with national standards.

### Thermal hazard

Not relevant.

| Exposure scenario                                                                          | PROC*                           | Exposure                                                               | Local control / local measures                   | Effectiveness       |
|--------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------------------|--------------------------------------------------|---------------------|
| Industrial production of hydraulic building and construction materials                     | 2,3                             | Length is not limited (up to 480 minutes per shift, 5 shifts per week) | not required                                     | -                   |
|                                                                                            | 14, 26                          |                                                                        | A) P1 mask (FF, FM)<br>or<br>B) not required     | APF = 4<br>-        |
|                                                                                            | 5, 8b, 9                        |                                                                        | A) P2 mask (FF, FM)<br>or<br>B) P1 mask (FF, FM) | APF = 10<br>APF = 4 |
| Industrial use of dry hydraulic building and construction materials (internal, external)   | 2                               |                                                                        | not required                                     | -                   |
|                                                                                            | 14, 22, 26                      |                                                                        | A) P1 mask (FF, FM)<br>or<br>B) not required     | APF = 4<br>-        |
|                                                                                            | 5, 8b, 9                        |                                                                        | A) P2 mask (FF, FM)<br>or<br>B) P1 mask (FF, FM) | APF = 10<br>APF = 4 |
| Industrial use of wet suspensions of hydraulic building and construction materials         | 7                               |                                                                        | A) P1 mask (FF, FM)<br>or<br>B) not required     | APF = 4<br>-        |
|                                                                                            | 2, 5, 8b, 9, 10, 13, 14         |                                                                        | not required                                     | -                   |
| Professional use of dry hydraulic building and construction materials (internal, external) | 2                               |                                                                        | P1 mask (FF, FM)                                 | APF = 4             |
|                                                                                            | 9, 26                           |                                                                        | A) P2 mask (FF, FM)<br>or<br>B) P1 mask (FF, FM) | APF = 10<br>APF = 4 |
|                                                                                            | 5, 8a, 8b, 14                   |                                                                        | A) P3 mask (FF, FM)<br>or<br>B) P1 mask (FF, FM) | APF = 20<br>APF = 4 |
|                                                                                            | 19                              |                                                                        | P2 mask (FF, FM)                                 | APF = 10            |
| Professional use of wet suspensions of hydraulic building and construction materials       | 11                              |                                                                        | A) P2 mask (FF, FM)<br>or<br>B) P1 mask (FF, FM) | APF = 10<br>APF = 4 |
|                                                                                            | 2, 5, 8a, 8b, 9, 10, 13, 14, 19 |                                                                        | not required                                     | -                   |

\*PROC are determined uses and defined in point 1.2.

APF survey of various RPE (according to STN EN 529:2005) may be found in the MEASE glossary (16).

When wearing each RPE, as defined above, other principles must be applied at the same time – a comparison of working hours with the real exposure time, the principles should reflect physiological stress (burden) of the employee when wearing it - worse breathing, the weight of RPE, higher thermal stress owing to head cover. Moreover, it is assumed that using tools and communication is during wearing reduced. That is why employee should be (i) healthy (especially in respect of healthy problems which may affect using RPE), (ii) have appropriate features / the shape of the face for the given type of RPE in order to minimize penetrations between the face and the mask (with respect to scars and moustache). If the recommended apparatus does not tight properly, it will not provide protection safely.

Employers and self-employed persons are legally responsible for the maintenance and issue of protective aids for airways and control of their proper use at the workplace. That is why they should define and document how to handle with breathing apparatus appropriately, including the training of employees.

### 8.2.3 Controls of environmental exposure

Environmental exposure limits for the emissions of cement particles into air must be in accordance with available technology and regulations for the emissions of dust particles generally.

Environmental exposure limit is relevant for the water environment, such as the emissions of cements in different phases of the life cycle (the production and use), especially in respect to the underground and sewage water. Effects in water environment and risk assessment includes the impact on organisms / ecosystems as a result of potential change related to pH (hydroxides dissolution). Toxicity of other dissolved inorganic ions is expected to be negligible in comparison with possible effect of pH change.

Local measure is expected in relation to pH changes for any effects that may appear during the production and use. Sewage water and surface water pH should not exceed 9. Otherwise it could lead to impact on the municipal sewage treatment plants and industrial sewage treatment plants. The following steps are suggested in respect of such exposure assessment:

Stage 1: Get information about sewage pH and cement contribution to the resulting pH. If the pH value is higher than 9, it can be caused by cement; further steps are needed in order to provide safe use.

Stage 2: Get information about pH of water in the point of inflow. The pH of water cannot exceed 9.

Stage 3: Measure pH in recipient in the point of outflow. If the pH value is lower than 9, safe use is fairly provable. If the established pH value is higher than 9, risk control measures must be adopted: sewage water must be neutralized and the safe use of cement during production or its use must be ensured.

No special measures for the regulation of emissions with respect to terrestrial environment (soil) are required.

## SECTION 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

This information applies to the whole mixtures.

- (a) **Form:** Solid powder material. Dry cements are finely ground solid inorganic materials. Size of particles primarily 5-30 µm.
- (b) **Colour:** Grey.
- (c) **Odour:** No odour, no odour limit.
- (d) **Melting point / Solidification point:** > 1 250 °C.

- (e) **Boiling point or initial boiling point and boiling range:** N/A.
- (f) **Flammability:** The mixture is not flammable.
- (g) **Upper and lower explosive limits:** N/A.
- (h) **Flashpoint:** N/A.
- (i) **Auto-ignition temperature:** N/A.
- (j) **Decomposition temperature:** N/A.
- (k) **pH:** When mixed with water in a ratio of 2:1 at a temperature of 20°C, a cement paste with a pH of 11 - 13.5 is formed.
- (l) **Kinematic viscosity:** N/A.
- (m) **Solubility:** In water: 0.1- 1.5 g/l.
- (n) **Partition coefficient (log value):** N/A.
- (o) **Vapour pressure:** N/A.
- (p) **Density and/or relative density:** bulk density of loose cement: 0.9 - 1.5 g/cm<sup>3</sup>, specific gravity of cement: 2.9 - 3.15 g/cm<sup>3</sup>.
- (q) **Relative vapour density:** N/A.
- (r) **Particle properties:** d (10%) = 1.5 - 2 µm, d (50%) = 10 - 20 µm, d (90%) = 35 - 90 µm, determination by laser diffraction analysis.

## 9.2 Other information.

Cement has a corrosive effect on aluminium.

# SECTION 10. Stability and reactivity

## 10.1 Reactivity

After mixing with water, cement will solidify into stable mass which is not reactive in normal environment.

## 10.2 Chemical stability

Dry cements are stable if they are stored properly (see Section 7), and they are compatible with a majority of other building materials. It is necessary to store them in dry place. It is necessary to avoid contact with incompatible materials.

Wet cement is alkaline and incompatible with acids, ammonium salts, aluminium or other non-noble metals. Cement is soluble in hydrofluoric acid generating corrosive gas of silicon tetrafluoride. Cements react with water generating silicates and calcium hydroxide. Silicates in cements react with strong oxidizing agents such as fluorine, boron fluoride, chlorine fluoride, manganese fluoride and oxygen difluoride.

## 10.3 Possibilities of hazardous reactions

Cement does not cause any hazardous reactions.

## 10.4 Conditions to avoid

Wet conditions during storing may cause lumping and the loss of the product quality.

## 10.5 Incompatible materials

Acids, ammonium salts, aluminium or other non-noble metals. It is necessary to avoid uncontrolled use of aluminium powder, hydrogen is generated /developed.

## 10.6 Hazardous decomposition products

Cements do not decompose to any hazardous products.

## SECTION 11: Toxicological information

### 11.1 Information on the hazard classes as defined in Regulation (EC) No 1278/2008

| Hazard class                                                | Cat. | Effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Reference             |
|-------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Acute toxicity - dermal                                     | -    | Limit test, rabbit, contact after 24 hours, 2000 mg/kg of body weight, non-lethal. Classification criteria are not fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (2)                   |
| Acute toxicity - inhalation (gases, vapours, dust and mist) | -    | If no acute effects were noticed during inhaling. Classification criteria are not fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (9)                   |
| Acute toxicity - oral                                       | -    | No data about toxicity result from studies of dust generated from production of Portland clinker. Classification criteria are not fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Literature research   |
| Causticity / skin irritant                                  | 2    | Contact of cement with wet skin may cause swelling, cracking or bursting of the skin. Further contact with simultaneous friction may cause strong burning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (2), human experience |
| Serious eye damage / eye irritation                         | 1    | Portland clinker caused various reflection of influences to the cornea and the calculated index of irritation was approx. 128. General purpose cements contain different quantity of Portland clinker, fly ash, blast furnace slag and plaster, natural pozzolan and calcined slate, silicic dust and lime stone. Direct contact with cement may cause mechanical damage to the cornea or immediate or late irritation or inflammation. Direct contact with higher quantity of dry cement dust or spraying by wet cement may cause effects varying from light irritation of eyes (e.g. conjunctivitis or eyelid inflammation) up to chemical burnings / acid burning and the loss of sight. | (10), (11)            |
| Skin sensitisation                                          | 1B   | After exposure to wet cement dust some individuals may suffer from eczema caused either by high pH arising contact dermatitis due to long-term irritation, or immunological reaction to soluble Cr(VI) which causes contact allergic dermatitis. Reaction may appear in various forms from light rash up to heavy dermatitis and it is a combination of both above mentioned mechanisms. If cement contains reduction agent for reduction of content of soluble Cr(VI) and if during storage period limit for soluble Cr(VI) is not exceeded, sensibilizing effects are not expected. (reference (3))                                                                                       | (3), (4), (17)        |

|                           |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |
|---------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Respiratory sensitisation | - | No signs of respiratory hypersensitiveness. Classification criteria are fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (1)                 |
| Germ cell mutagenicity    | - | No indication. Classification criteria are not fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (12), (13)          |
| Carcinogenicity           | - | No causal connection between exposure to Portland cement and cancer was confirmed. Epidemiology literature does not support Portland cement as possible human carcinogen. Portland cement is not classified as human carcinogen (according to ACGIH A4: Agents which cause worries about carcinogenicity for people, but which cannot be objectively assessed due to the lack of information. Studies in vitro or on animals do not provide the indications of carcinogenicity which are sufficient for agent classification by any other identification). Portland cement contains up to 5% dust particles. Classification criteria are not fulfilled based upon available data. | (1)<br><br>(14)     |
| Reproductive toxicity     | - | Classification criteria are not fulfilled based upon available data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | No human experience |
| STOT - one time exposure  | 3 | Dust from Portland cement may irritate the throat and the airways. During exposure to concentrations higher than exposure limits at the workplace may appear coughing, sneezing and breathlessness / dyspnoea. Generally, the structure of evidence clearly shows that exposure to cement dust in working environment causes the insufficiency of the breathing function. However, currently available evidence is not sufficient to determine specific certainty in relation to the amount of dose and these effects.                                                                                                                                                            | (1)                 |
| STOT - repeated exposure  | - | There exist COPD indication. Effects are acute due to high exposition. No effects or effects at lower concentrations were observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (15)                |
| Hazard when inhaled.      | - | Not used, because cements are not used as aerosols.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |

Unlike skin sensitization Portland clinker and general purpose cements have the same toxicological and eco-toxicological properties.

#### **State of health condition worsened after exposure**

Inhaling cement dust may worsen the existing airways disease or the state of health, such as emphysema (lungs emphysema) or asthma or the existing condition of skin or eyes.

## **SECTION 12: Ecological information**

### **12.1 Toxicity**

The product is not dangerous to the environment. Eco-toxicological tests of Portland cement for *Daphnia magna* (reference 5) and *Selenastrum coli* (reference 6) showed only low toxic influence. That is why values LC 50 and EC 50 could not be determined (reference 7). No sign



of toxicity in sediment (reference 8). However, the presence of a high quantity of cement in water may cause a pH increase and that is why it may be toxic for water life under certain circumstances (water environment, water organisms).

## **12.2 Persistence and degradability**

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

## **12.3 Bioaccumulative potential**

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

## **12.4 Mobility in soil**

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

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

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

## **12.6 Other adverse effects**

Irrelevant.

# **SECTION 13: Disposal considerations**

## **13.1 Waste treatment methods**

Do not dispose into sewerage system or surface waters.

### **Product - cement which exceeded its usable life / shelf-life / storage period**

(and if proved that it contains more than 0.0002 % of soluble Cr(VI)): must be used or sold only in controlled closed and fully automatized processes or should be recycled or disposed of in accordance with the applicable legal regulations, or used as a reduction agent again.

### **Product - unused rests or spilled dry material**

Take the unused dry rests or spilled dry material as they are. Mark the containers. It is possible to reuse the material again while assessing its usable period and requirements preventing from dusting. In case of disposal it solidifies with water and must be disposed according to the below mentioned instructions "Product - after mixing with water / after adding water it is solid".

### **Product - sludge**

Let the sludge solidify, avoid penetration or pouring into sewage water and sewerage systems or into water surfaces and dispose according to the below mentioned instructions "Product - after mixing with water / after adding water it is solid".

### **Product - after mixing with water / after adding water it is solid**

Dispose according to the local legislation. Prevent from penetration into the sewerage water system. Dispose the solidified product as particular building waste. Regarding the fact that solidification makes the material quite inert, the concrete waste is not dangerous.

## **Catalogue numbers of wastes (EWC):**

**10 13 14** - Waste concrete and concrete sludge (10 Wastes from thermal processes, 10 13 Wastes from production of cement, lime and plaster and products made of them)

**17 01 01** - Concrete (17 Building and demolition wastes (including the extracted soil from contaminated places, 17 01 Concrete, bricks, roofing and ceramics)

Packaging - completely empty packaging and dispose of in accordance with legislation.

**15 01 01** - Paper and cardboard packages (15 Waste packages, absorption agents, cleaning clothes, filtration materials and protective clothes not determined otherwise, 15 01 Packages (including separately collected municipal waste)

## **SECTION 14: Transport regulations**

General purpose cements are not included in the international regulation on transport of dangerous goods (IMDG, IATA, ADR/RID); no classification is required. No special preventative measures are needed, except for those mentioned in Section 8.

### **14.1 UN number or identification number**

Irrelevant

### **14.2 Proper UN shipping name**

Irrelevant

### **14.3 Transport hazard class(es)**

Irrelevant

### **14.4 Packing group**

Irrelevant

### **14.5 Environmental hazards**

Irrelevant

### **14.6 Special precautions for users**

Irrelevant

### **14.7 Maritime transport in bulk according to IMO instruments**

Irrelevant

## **SECTION 15: Regulatory information**

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

Cement is a mixture according to the REACH Regulation (EC) 1907/2006 and is not subject to registration. Cement (Portland) clinker is excluded from registration liability (art. 2 sec. 7 letter b and supplement V point 7 of the REACH Regulation).

Launching to market and using is limited owing to the content of soluble Cr(VI) - Supplement XVII point 47 of the REACH Regulation:

1. Cement and preparations containing cement must not be used or launched to market if after mixing with water they contain more than 0.0002 % of soluble hexavalent chrome related to the total weight of dry cement.
2. If reduction agents are used, package of cement or preparations containing cement must be legibly and undeletably marked with information about date of packing, as well as information about storage conditions and storage period suitable for keeping the reduction agent active and keeping the content of soluble hexavalent chrome under limit mentioned in paragraph 1, without touching application of other regulations of the Association on classification, packing and marking of dangerous substances and preparations.
3. Paragraphs 1 and 2 are not used for launching into market and use in the controlled closed and fully automatized processes in which only machinery is handling with cement and preparations containing cement, and no contact with skin is possible.

Within social dialogue "Agreement on health protection of employees by means of proper handling and proper use of crystalline silicon and products which contain it" the trade association of employees and employers (among which is also CEMBUREAU) accepted so called "good practice guide" containing recommendations for practice of safe handling (<http://www.nepsi.eu/good-practise-guide.aspx>).

## 15.2 Chemical safety assessment

No assessment of chemical safety of the mixture was carried out.

## SECTION 16: Other information

### 16.1 Information on the current version of the Safety Data Sheet

This version of the Safety Data Sheet is revised according to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), as amended by Commission Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to the REACH Regulation. This revision is supplemented with cements CEM VI (S-LL) 42,5 N, CEM VI (S-LL) 32,5 R, CEM VI (S-LL) 32,5N.

### 16.2 Abbreviations and acronyms (abbreviated words)

|                  |                                                                                                                                                                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ADR / RID</b> | European Agreements on the transport of Dangerous goods by Road / Railway                                                                                                                                                                                                                                |
| <b>ACGIH</b>     | American Conference of Industrial Hygienists                                                                                                                                                                                                                                                             |
| <b>APF</b>       | Assigned protection factor                                                                                                                                                                                                                                                                               |
| <b>BL = SDS</b>  | Safety Data sheet                                                                                                                                                                                                                                                                                        |
| <b>CAS</b>       | Chemical Abstracts Service, Chemical Abstracts Service keeps a complete list of chemical substances. Each substance registered in the register has its CAS registration number. CAS registration number (usually mentioned as CAS No.) is widely used as specific numeric marking of chemical substance. |
| <b>CLP</b>       | Classification, labelling and packaging (EC Regulation No. 1207/2008)                                                                                                                                                                                                                                    |
| <b>COPD</b>      | Chronic Obstructive Pulmonary Disease                                                                                                                                                                                                                                                                    |

|                        |                                                                                                                                                                                                                                                                                                            |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DNEL</b>            | Derived no effect level (defined level at which there are no adverse effects on human health)                                                                                                                                                                                                              |
| <b>Eye Dam 1</b>       | Serious eye damage                                                                                                                                                                                                                                                                                         |
| <b>EC<sub>50</sub></b> | Half maximal effective concentration (median effective concentration (concentration causing death or immobilisation of 50% of tested organisms, e.g. Daphnia magna)                                                                                                                                        |
| <b>ECHA</b>            | European Chemicals Agency                                                                                                                                                                                                                                                                                  |
| <b>EINECS</b>          | European Inventory of Existing Commercial Chemical Substances                                                                                                                                                                                                                                              |
| <b>EPA</b>             | Type of high efficiency air filter                                                                                                                                                                                                                                                                         |
| <b>EpiDerm TM</b>      | Reconstructed human epidermis for testing purposes                                                                                                                                                                                                                                                         |
| <b>ES / SE</b>         | Exposure scenario                                                                                                                                                                                                                                                                                          |
| <b>GefStoffV</b>       | Gefahrstoffverordnung (dangerous substances)                                                                                                                                                                                                                                                               |
| <b>HEPA</b>            | Type of high efficiency air filter                                                                                                                                                                                                                                                                         |
| <b>H&amp;S</b>         | Health and Safety                                                                                                                                                                                                                                                                                          |
| <b>IATA</b>            | International Air Transport Association                                                                                                                                                                                                                                                                    |
| <b>IMDG</b>            | International agreement on the Maritime transport of Dangerous Goods                                                                                                                                                                                                                                       |
| <b>LC<sub>50</sub></b> | Median lethal concentration, 50% (medium lethal concentration causing death of 50% of tested fish in the given time period)                                                                                                                                                                                |
| <b>LD<sub>50</sub></b> | Median lethal dose                                                                                                                                                                                                                                                                                         |
| <b>LOEL</b>            | Lowest observed effect level (lowest observed effect level, means the lowest tested dose or exposure level during which in certain study was observed statistically significant effect in exposed population in comparison with a suitable control group)                                                  |
| <b>MEASE</b>           | Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Euromeraux, <a href="http://www.ebrc.de/ebrc/ebrc-mease.php">http://www.ebrc.de/ebrc/ebrc-mease.php</a>                                                                                                                   |
| <b>MS</b>              | Member State                                                                                                                                                                                                                                                                                               |
| <b>NOEC</b>            | No observable effect concentration (the highest tested concentration of toxic substance during which no statistically significant adverse effect to organisms happened in comparison with control (approx. to 5% of mortality), concentration does not cause visible effect)                               |
| <b>NOEL</b>            | No observed effect level (dose without observed adverse effect - dose level without the observed effect is the highest tested dose level or exposure level during which in certain study no statistically significant effects were found out in exposed group in comparison with a suitable control group) |
| <b>OECD</b>            | Organisation for Economic Co-operation and Development                                                                                                                                                                                                                                                     |
| <b>OECD TG</b>         | OECD Technical Guidance                                                                                                                                                                                                                                                                                    |
| <b>OELV</b>            | Occupational exposure limit value                                                                                                                                                                                                                                                                          |

|                        |                                                                                                                                                                                                                               |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PBT</b>             | Persistent, bioaccumulative and toxic                                                                                                                                                                                         |
| <b>PEL<sub>c</sub></b> | Permissible exposure limit                                                                                                                                                                                                    |
| <b>PNEC</b>            | Predicted no-effect concentration (determined concentration during which no adverse effects to environment happens)                                                                                                           |
| <b>PROC</b>            | Process category                                                                                                                                                                                                              |
| <b>REACH</b>           | Registration, Evaluation and Authorisation of Chemicals - registration, evaluation and authorisation and limits of chemical substances (EC Regulation No. 1907/2006)                                                          |
| <b>SCOEL</b>           | Scientific Committee on Occupational Exposure Limit Values                                                                                                                                                                    |
| <b>Skin Irrit.</b>     | Skin irritation                                                                                                                                                                                                               |
| <b>Skin Sens.</b>      | Skin sensitisation                                                                                                                                                                                                            |
| <b>STOT</b>            | Specific Target Organ Toxicity, SE - one time, RE – repeated exposure                                                                                                                                                         |
| <b>STP</b>             | Sewage treatment plant                                                                                                                                                                                                        |
| <b>TLV-TWA</b>         | Threshold Limit Value-Time-Weighted Average (threshold limit, time-weighted average concentration of chemical substance in air (mg.m <sup>-3</sup> ) which the employee may be exposed during working hours, usually 8 hours) |
| <b>TRGS</b>            | Technische Regeln für Gefahrstoffe (technical instructions for dangerous substances)                                                                                                                                          |
| <b>UVC</b>             | Substance of Unknown or Variable composition, Complex reaction products                                                                                                                                                       |
| <b>UVCB</b>            | Substance of Unknown or Variable composition, Complex reaction products or Biological materials                                                                                                                               |
| <b>VLE-MP</b>          | Exposure limit value - weighted average in mg by cubic meter of air                                                                                                                                                           |
| <b>vPvP</b>            | Very persistent, very bioaccumulative                                                                                                                                                                                         |

### 16.3 Main references to literature and information sources

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- (4) Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr (VI) in cement, NIOH, Page 11, 2003
- (5) U. S. EPA, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 3rd ed. EPA/600/7-91/002, Environmental Monitoring and Support Laboratory, U. S. EPA, Cincinnati, OH (1994a) and 4<sup>th</sup> ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (2002).

- (6) U. S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 4th ed. EPA/600/4-90/027F, Environmental Monitoring and Support Laboratory, U. S. EPA, Cincinnati, OH (1993) and 5<sup>th</sup> ed. EPA-821-R-02-012, US EPA, office of water, Washington D. C. (2002)
- (7) Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D. C. 2001.
- (8) Final report Sediment Phase Toxicity Test Results with *Corophium volutator* for Portland clinker prepared for Norcem A. S. by AnalyCen Ecotox AS, 2007.
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- (11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.
- (12) Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Vas Berlo et al, Chem. Res. Toxicol., 2009 Sept; 22(9):1548-58.
- (13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.
- (14) Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008
- (15) Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Norbø, National Institute of Occupational Health, Oslo, Norway, March 2010
- (16) MEASE, Metals estimation and Assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/ebrc/ebrc-mease.php>.
- (17) TRGS 900, Arbeitsplatzgrenzwerte, Technische Regel für Gefahrstoffe, 2009, GMBI Nr.29 S.605

#### **16.4 Training instructions**

Except for training programs about health protection, safety at work and protection of environment for their employees the companies must ensure so that the employees read this Safety Data Sheet (SDS), understand it and applied its requirements.

#### **16.5 Scope of liability**

Information in this Safety Data Sheet reflect contemporary available knowledge and are reliable provided that the product is used under the given conditions and in accordance with determined uses mentioned on package or in technical guides / material data sheets. Any other use of this product including use of this product in combination with any other product, or any other processes is the user's responsibility. It results thereof

that the user is responsible for determination of proper safety measures and for application of legislation covering his/her own activities.