### 1. Identification of the substance/mixture and of the company

#### 1.1 Product identifier

**CEM I 52,5N Portland cement**

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

**Use(s):**

Cements are used in industrial installations to manufacture/formulate hydraulic binders for building and construction work, such as ready-mixed concrete, mortars, renders, grouts, plasters as well as precast concrete.

Common cements and cement containing mixtures (hydraulic binders) are used industrially, by professionals as well as by consumers in building and construction work, indoor and outdoor. The identified uses of cements and cement containing mixtures cover the dry products and the products in a wet suspension (paste).

<table>
<thead>
<tr>
<th>PROC(Uses)</th>
<th>Use description</th>
<th>Manufacture/formulation of building materials</th>
<th>Professional/industrial use of building materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Use in closed, continuous processes with occasional, controlled exposure</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Use in closed batch processes</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Mixing or blending in batch processes to form preparations and articles</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>Industrial spraying</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8a</td>
<td>Transfer of substance or preparation from/to vessels/large containers at non dedicated facilities</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8b</td>
<td>Transfer of substance or preparation from/to vessels/large containers at non dedicated facilities</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>Transfer of substance or preparation into small containers</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>Roller application or brushing</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Non-industrial spraying</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Treatment of articles by dipping and pouring</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Production of preparations or articles by tabletting, compression, extrusion, pelletisation</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
### 1.3 Details of the supplier of the Safety Data Sheet

| Manufacturer, Importer, Supplier: | Name: Holcim (Bulgaria) AD  
Address: 3040 Beli Izvor, Vratza  
tel.: +359 92 661341 fax: +359 92 661371  
URL website: www.holcim.bg |
|---|---|
| Responsible persons for the SDS | Health & Safety – georgi.iliev@lafargeholcim.com  
Environment – plamen.valchev@lafargeholcim.com  
Quality – tsvetana.kostova@lafargeholcim.com |

### 1.4 Emergency telephone:

| Emergency telephone: | National Toxicology Center  
Hospital for Active Medical Treatment and Emergency Medicine "N.I.Pirogov"  
Phone for emergency: +359 2 9154 233  
Hours of operation: 24 / 7  
Phone for emergency / fax: +359 2 9154 409  
Hours of operation: 8-16 h / 7  
E-mail: poison_centre@mail.orbitel.bg  
http://www.pirogov.bg  
Information provided will be limited to: seek First aid or closest Toxicology Center  
Service is provided in the following language: BG/ EN  
Available outside office hours? |
### 2. Hazards identification

#### 2.1 Classification of the substance or mixture

#### 2.1.1. Classification according to Regulation 1272/2008 (CLP)

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Hazard category</th>
<th>Hazard statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin irritation</td>
<td>2</td>
<td>H315: Causes skin irritation</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>1</td>
<td>H318: Causes serious eye damage</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>1B</td>
<td>H317: May cause an allergic skin reaction</td>
</tr>
<tr>
<td>Specific target organ toxicity</td>
<td>3</td>
<td>H335: May cause respiratory irritation</td>
</tr>
<tr>
<td>single exposure respiratory tract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>irritation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2.2 Label elements

#### 2.2.1. Labelling in accordance with Regulation 1272/2008 (CLP)

<table>
<thead>
<tr>
<th>Pictogram (s)</th>
<th>Hazard statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS05 – Corrosive</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>GHS07 – Attention</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>Signal word: Danger</td>
<td>May cause an allergic skin reaction</td>
</tr>
<tr>
<td></td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>Hazard statements</td>
<td>H318</td>
</tr>
<tr>
<td></td>
<td>H315</td>
</tr>
<tr>
<td></td>
<td>H317</td>
</tr>
<tr>
<td></td>
<td>H335</td>
</tr>
</tbody>
</table>
### Supplemental information
Skin contact with wet cement, fresh concrete or mortar may cause irritation, dermatitis or burns. May cause damage to products made of aluminium or other non-noble metals.

### 2.3. Other hazards

PBT/vPvB: Cement does not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation (EC) No 1907/2006).

The product contains chromate reducing agent. As a result, the content of soluble chromium (VI) is less than 2 ppm. If the storage conditions are not appropriate or the storage period is exceeded, the effectiveness of the reducing agent can diminish, and the cement can become skin sensitizing (R43 resp. H317 or EUH203).

### 3. Composition / information on ingredients

#### 3.1 Substances – inapplicable, since the product is a mixture.

#### 3.2 Composition – main components, according to the EN 197-1:2011:

Portland cement clinker  95 – 100%
Other components 0 – 5%

<table>
<thead>
<tr>
<th>Component Concentration (w/w in cement)</th>
<th>EINECS</th>
<th>CAS</th>
<th>REACH Registration No.</th>
<th>Classification Regulation 67/548/EEC (valid until 31.05.2015)</th>
<th>Classification under Regulation 1272/2008 (CLP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Description</td>
<td>Concentration</td>
<td>UN Number</td>
<td>CAS Number</td>
<td>Classification</td>
<td>Effects</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------</td>
<td>-----------</td>
<td>------------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>Portland cement clinker</td>
<td>95 - 100%</td>
<td>266-043-4</td>
<td>65997-15-1</td>
<td>Exempt</td>
<td>Skin irritation 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin sensitisation 1B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Serious eye damage 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Specific target organ toxicity-single exposure - 3</td>
</tr>
<tr>
<td>Flue dust from production of cement clinker</td>
<td>0 - 5%</td>
<td>270-659-9</td>
<td>68475-76-3</td>
<td>Irritant: Xi</td>
<td>Skin irritation 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin sensitisation 1B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Specific target organ toxicity-single exposure - 3</td>
</tr>
<tr>
<td>Reducing agent</td>
<td>0 - 0.5%</td>
<td>231-753-5</td>
<td>01-2119</td>
<td>Toxic: Xn</td>
<td>Acute toxicity - 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Serious eye damage/ eye irritation -2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin irritation - 2</td>
</tr>
<tr>
<td>Grinding aid</td>
<td>0 - 0.2%</td>
<td>000122-20-3</td>
<td>204-528-4</td>
<td>Irritant: Xi</td>
<td>Serious eye damage/ eye irritation - 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dangerous for the aquatic environment - chronic hazard - 3</td>
</tr>
</tbody>
</table>

4. First aid measures

4.1 Description of first aid measures - No personal protective equipment is needed for victim and first aid responders. The latter should avoid contact with wet cement or wet cement containing preparations.

Following contact with eyes: Do not rub eyes in order to avoid possible cornea damage as a result of mechanical stress. Remove contact lenses if any. Incline head to injured eye, open the eyelid(s) widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for at least 20 minutes to remove all particles. If possible, use isotonic water (0.9% NaCl). Contact a specialist of occupational medicine or an eye specialist.
Following skin contact: For dry cement, remove and rinse abundantly with water. For wet cement, wash skin with plenty of water. Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them. Seek medical treatment in all cases of irritation or burns.

Following ingestion: Do not induce vomiting. If the person is conscious, wash out mouth with water and give plenty of water to drink. Get immediate medical attention or contact the anti poison centre.

Following inhalation: Move the person to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops or if discomfort, coughing or other symptoms persist.

4.2 Most important symptoms and effects, both acute and delayed

| Acute reactions | Eyes: Eye contact with cement (dry or wet) may cause serious and potentially irreversible injuries.  
|                 | Skin: Cement may have an irritating effect on moist skin (due to sweat or humidity) after prolonged contact or may cause contact dermatitis after repeated contact. Prolonged skin contact with wet cement or wet concrete may cause serious burns because they develop without pain being felt (for example when kneeling in wet concrete even when wearing trousers). Inhalation: Repeated inhalation of dust of common cements over a long period of time increases the risk of developing lung diseases. Environment: Under normal use, common cement is not hazardous to the environment. |

4.3 Indication of any immediate medical attention and special treatment needed

When contacting a physician, take this SDS with you.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media - Common cements are not flammable.

5.2 Special hazards arising from the substance or mixture - Cements are non-combustible and non-explosive and will not facilitate or sustain the combustion of other materials
5.3 **Advice for fire-fighters** - Cement poses no fire-related hazards. No need for special protective equipment for fire fighters.

Special protective equipment – not required

Special precautions – not required

---

6. Accidental release measures

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

**For non-emergency personnel** - Wear protective equipment as described under Section 8 and follow the advice for safe handling and use given under Section 7.

**For emergency responders** - Emergency procedures are not required. However, respiratory protection is needed in situations with high dust levels.

6.2 **Environmental precautions** - Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

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

Collect the spillage in a dry state if possible.

**Dry cement**
Use cleanup methods such as vacuum clean-up or vacuum extraction (Industrial portable units, equipped with high efficiency air filters (EPA and HEPA filters, EN 1822-1:2009) or equivalent technique) which do not cause airborne dispersion. Never use compressed air.
Alternatively, wipe-up the dust by mopping, wet brushing or by using water sprays or hoses (fine mist to avoid that the dust becomes airborne) and remove slurry. If not possible, remove by slurring with water (see wet cement).
When wet cleaning or vacuum cleaning is not possible and only dry cleaning with brushes can be done, ensure that the workers wear the appropriate personal protective equipment and prevent dust from spreading.
Avoid inhalation of cement and contact with skin. Place spilled materials into a container. Solidify before disposal as described under Section 13.

**Wet cement**
Clean up wet cement and place in a container. Allow material to dry and solidify before disposal as described under Section 13.

6.4 **Reference to other sections**
See sections 8 and 13 for more details.

---

7. **Handling and storage**

7.1 **Precautions for safe handling**

**Technical protective measures:**
Follow the recommendations given under Section 8.
To clean up dry cement, see Subsection 6.3.

**Measures to prevent fire**
Not applicable.

**Measures to prevent aerosol and dust generation**
Do not sweep. Use dry cleanup methods such as vacuum clean-up or vacuum extraction, which do not cause airborne dispersion.
For more information, refer to the practice guidelines adopted under the Social Dialogue Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it, by Employee and Employer European sectoral associations, among which CEMBUREAU. These safe handling practices It can...
Measures to protect the environment

No particular measures.

General (occupational hygiene):

Do not handle or store near food and beverages or smoking materials.
In dusty environment, wear dust mask and protective goggles. Use protective gloves to avoid skin contact.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.
Engulfment hazard: Cement can build-up or adhere to the walls of a confined space and later release, collapse or fall unexpectedly. To prevent engulfment or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains cement without taking the proper security measures.
Packed products should be stored in unopened bags clear of the ground in cool, dry conditions and protected from excessive draught in order to avoid degradation of quality. Bags should be stacked in a stable manner.

Incompatible substances/mixtures

Do not use aluminium containers due to incompatibility of the materials.

7.3 Specific end use(s)

No additional information for the specific end uses (see section 1.2).

7.4 Control of soluble Cr (VI)

For cements treated with a Cr (VI) reducing agent according to the regulations given in Section 15, the effectiveness of the reducing agent diminishes with time. Therefore, cement bags and/or delivery documents will contain information on the packaging date, the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below 0.0002 % of the total dry weight of the cement ready for use, according to EN 196-10. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.

8. Exposure controls/personal protection

8.1 Control parameters


Limit values of professional exposure

| Limit values of professional exposure | DNEL, inhalation /8 hours/ 3 mg/m3 | DNEL, dermal inapplicable | DNEL, oral inapplicable | PNEC /predicted no-effect concentration/ for water inapplicable | PNEC for sediment inapplicable | PNEC for soil inapplicable |
8.2 Exposure control - For each individual PROC, users can choose from either option A) or B) in the table above, according to what is best suited to their specific situation. If one option is chosen, then the same option has to be chosen in the table from section “8.2.2 Individual protection measures such as personal protection equipment” - Specification of respiratory protective equipment. Only combinations between A) – A) and B) – B) are possible.

8.2.1. Appropriate engineering controls:
Measures to reduce generation of dust and to avoid dust propagating in the environment such as dedusting, exhaust ventilation and dry clean-up methods which do not cause airborne dispersion.

<table>
<thead>
<tr>
<th>Exposure scenario (ES)</th>
<th>PROC *</th>
<th>Exposure</th>
<th>Localized control</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial manufacturing/ formulation of hydraulic binding agents and building materials</td>
<td>2, 3 14, 26</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts per week).</td>
<td>not required</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5, 8b, 9</td>
<td></td>
<td>A) not required</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>or B) generic local exhaust ventilation</td>
<td>78%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A/generic ventilation or</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B) generic local exhaust ventilation</td>
<td>78%</td>
</tr>
<tr>
<td>Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)</td>
<td>2 14, 22, 26</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)</td>
<td>not required</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>5, 8b, 9</td>
<td></td>
<td>A) not required</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>or or B) generic local exhaust ventilation</td>
<td>78%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A/generic ventilation or</td>
<td>17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B) generic local exhaust ventilation</td>
<td>78%</td>
</tr>
<tr>
<td>Industrial uses of wet suspension of hydraulic building and construction materials</td>
<td>7</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)</td>
<td>A/ not required</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2, 5, 8b, 9, 10, 13, 14</td>
<td></td>
<td>or B) generic local exhaust ventilation</td>
<td>78%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not required</td>
<td>-</td>
</tr>
</tbody>
</table>
Holcim

Safety Data Sheet
according to Regulation (EC) No 1907/2006 (REACH) as amended by Reg No 453/2010

CEMENT CEM I 52,5N

Date of issue: 01.06.2015                                           Version: 4/2015

8.2.2. Individual protection measures and personal protective equipment

Respiratory protection:

Use adequate respirator masks when exposure limit values are exceeded. These protection means must comply with the requirements applicable to the level of dust pollution as defined in the respective European standard EN 149 or a corresponding national standard.

<table>
<thead>
<tr>
<th>Exposure scenario</th>
<th>PROC*</th>
<th>Exposure</th>
<th>Specification of respiratory protective equipment (RPE)</th>
<th>RPE efficiency – assigned protection factor (APF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial manufacturing/ formulation of hydraulic binding agents and</td>
<td>2, 3</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts per</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>building materials</td>
<td>14, 26</td>
<td>week).</td>
<td>A/ FFP1 or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5, 8b, 9</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts per</td>
<td>B/ Not required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>week).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional use of dry hydraulic building and construction material</td>
<td>2</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)</td>
<td>Not required</td>
<td></td>
</tr>
<tr>
<td>(indoor, outdoor)</td>
<td>9, 26</td>
<td></td>
<td>A/ FFP2 or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5, 8a, 8b, 14</td>
<td></td>
<td>B/ FFP1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional uses of wet suspensions of hydraulic building and</td>
<td>11</td>
<td>Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)</td>
<td>A/ not required</td>
<td></td>
</tr>
<tr>
<td>construction materials</td>
<td></td>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>B/ generic local exhaust ventilation</td>
<td>72%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>localised controls are not applicable,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>process only in good ventilated rooms or outdoor</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*PROC refers to Uses – see section 1.2
| Materials (indoor, outdoor) | 5, 8b, 9 | A/ FFP2 or B/ FFP1 | APF=10  
|                           |         |                   | APF=4  |
| Industrial use of wet suspensions of building materials | 7 | A/ FFP1 or B/ Not required | APF=4  
|                          | 2, 5, 8b, 9, 10, 13, 14 | Duration is not restricted (up to 480 minutes per shift, 5 shifts per week). | -  
| Professional use of dry building materials (indoor, outdoor) | 2 | FFP1 | APF=4  
|                          | 9, 26 | A/ FFP2 or B/ FFP1 | APF=10  
|                          | 5, 8a, 8b, 14 | A/ FFP3 or B/ FFP1 | APF=20  
|                          | 19 | FFP2 | APF=4  
| Professional use of wet suspensions of building materials | 11 | A/ FFP2 or B/ FFP1 | APF=10  
|                          | 2, 5, 8a, 8b, 9, 10, 13, 14, 19 | Duration is not restricted (up to 480 minutes per shift, 5 shifts per week). | -  

*PROC refers to Uses – see Section 1.2

An overview of the APFs of different RPE (according to EN 529:2005) can be found in the glossary of MEASE (16).

Any RPE as defined above shall only be worn if the following principles are implemented in parallel: The duration of work (compare with “duration of exposure” above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker’s capability of using tools and of communicating are reduced during the wearing of RPE.

For reasons as given above, the worker should therefore be (i) healthy (especially in view of medical problems that may affect the use of RPE), (ii) have suitable facial characteristics reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely.

The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers.

Occupational hygiene | During work avoid kneeling in fresh mortar or concrete wherever possible. If kneeling is

Page 11 of 20
measures: absolutely necessary then appropriate waterproof personal protective equipment must be worn. Do not eat, drink or smoke when working with cement to avoid contact with skin or mouth. Before starting to work with cement, apply a barrier creme and reapply it at regular intervals. Immediately after working with cement or cement containing materials, workers should wash or shower or use skin moisturisers. Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using.

Eyes/face protection: Wear approved glasses or safety goggles according to EN 166 when handling dry or wet cement to prevent contact with eyes.

Skin protection: Use waterproof, abrasion and alkali resistant gloves (made of low soluble Cr (VI) containing material) internally lined with cotton, boots, closed long-sleeved protective clothing as well as skin care products (including barrier creams) to protect the skin from prolonged contact with wet cement. Particular care should be taken to ensure that wet cement does not enter the boots. In some circumstances, such as when laying concrete or screed, waterproof trousers or kneepads are necessary.

Thermal hazards Inapplicable

Environmental exposure controls:
Air: Environmental exposure control for the emission of cement particles into air has to be in accordance with the available technology and regulations for the emission of general dust particles.
Water: Do not wash cement into sewage systems or into bodies of water, to avoid high pH. Above pH 9 negative ecotoxicological impacts are possible.
Soil and terrestrial environment: No special emission control measures are necessary for the exposure to the terrestrial environment.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties - This information applies to the whole mixture.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Dry cement is a finely ground solid inorganic material (grey or white powder). Main particle size: 5-30 μm</td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>none</td>
</tr>
<tr>
<td>pH: (T = 20°C in water, water-solid ratio 1:2)</td>
<td>11-13.5</td>
</tr>
<tr>
<td>Melting point</td>
<td>&gt; 1250 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>under normal atmospheric conditions, boiling point &gt;1 250°C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable as is not a liquid</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable as is not a liquid</td>
</tr>
</tbody>
</table>
### Flammability (solid, gas)
Not applicable as is a solid which is noncombustible and does not cause or contribute to fire through friction

### Upper/lower flammability or explosive limits
Not applicable as is not a flammable gas

### Vapour pressure
Not applicable as melting point is > 1250 °C

### Vapour density
Not applicable as melting point is > 1250 °C

### Relative density
2.75-3.20; Apparent density: 0.9-1.5 g/cm³

### Solubility(ies) in water (T = 20 °C)
slight (0.1-1.5 g/l)

### Partition coefficient: n-octanol/water
Not applicable as is inorganic mixture

### Auto-ignition temperature
Not applicable (no pyrophoricity – no organo-metallic, organo-metalloid or organo-phosphine bindings or of their derivatives, and no other pyrophoric constituent in the composition)

### Decomposition temperature
Not applicable as no organic peroxide present

### Viscosity
Not applicable as not a liquid

### Oxidising properties
Not applicable as does not cause or contribute to the combustion of other materials.

### Explosive properties
Not applicable. Not explosive or pyrotechnic. Not in itself capable by chemical reaction of producing gas at such temperature and pressure and at such a speed as to cause damage to the surroundings. Not capable of a self-sustaining exothermic chemical reaction.

### 9.2 Other information – not applicable

### 10. Stability and reactivity

**10.1 Reactivity** - When mixed with water, cements will harden into a stable mass that is not reactive in normal environments.

**10.2 Chemical stability** - Dry cements are stable as long as they are properly stored (see Section 7) and compatible with most other building materials. They should be kept dry. Contact with incompatible materials should be avoided. Wet cement is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble metals. Cement dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates in cement react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, managanese trifluoride, and oxygen difluoride.

**10.3 Possibility of hazardous reactions** - Cements do not cause hazardous reactions.
10.4 Conditions to avoid - Humid conditions during storage may cause lump formation and loss of product quality.

10.5 Incompatible materials - Acids, ammonium salts, aluminium or other non-noble metals. Uncontrolled use of aluminium powder in wet cement should be avoided as hydrogen is produced.

10.6 Hazardous decomposition products - Cements will not decompose into any hazardous products.

11. Toxicological information

11.1 Information on toxicological effects

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Cat.</th>
<th>Effect</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - dermal</td>
<td>-</td>
<td>Limit test, rabbit, 2,000 mg/kg body weight – no lethality. Tests made with Portland cement containing more than 90% Portland cement clinker. Based on available data, the classification criteria are not met.</td>
<td>(2)</td>
</tr>
<tr>
<td>Acute toxicity - inhalation</td>
<td>-</td>
<td>No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met.</td>
<td>(8)</td>
</tr>
<tr>
<td>Acute toxicity - oral</td>
<td>-</td>
<td>No indication of oral toxicity from studies with cement kiln dust. Kiln dust contains varying quantities of Portland cement clinker. Based on available data, the classification criteria are not met.</td>
<td>Literature survey</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>2</td>
<td>Dry cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns. Tests made with Portland cement containing more than 90% Portland cement clinker.</td>
<td>(2) Human experience</td>
</tr>
<tr>
<td>Serious eye damage/irritation</td>
<td>1</td>
<td>Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128. Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact by larger amounts of dry cement or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns and blindness.</td>
<td>(9), (10)</td>
</tr>
<tr>
<td>Skin sensitisation</td>
<td>1B</td>
<td>Some individuals may develop eczema upon exposure to wet cement dust, caused either by the high pH which induces irritant contact dermatitis after prolonged contact, or by an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis.</td>
<td>(3), (11)</td>
</tr>
<tr>
<td>Respiratory sensitisation</td>
<td>-</td>
<td>There is no indication of sensitisation of the respiratory system. Based on available data, the classification criteria are not met.</td>
<td>(1)</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>-</td>
<td>No indication. Based on available data, the classification criteria are not met.</td>
<td>(12), (13)</td>
</tr>
</tbody>
</table>
Carcinogenicity

- No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen. Portland cement is not classifiable as a human carcinogen (According to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent with one of the other notations,). Portland cement contains over 90% clinker. Based on available data, the classification criteria are not met.

Reproductive toxicity

- Based on available data, the classification criteria are not met.

STOT /specific target organ toxicity/-single exposure

3 Cement dust may irritate the throat and respiratory tract. Coughing, sneezing, and shortness of breath may occur following exposures in excess of occupational exposure limits. Overall, the pattern of evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, evidence available at the present time is insufficient to establish with any confidence the dose-response relationship for these effects.

STOT / specific target organ toxicity/- repeated exposure

- There is an indication of COPD /chronic obstructive pulmonary disease/. The effects are acute and due to high exposures. No chronic effects or effects at low concentration have been observed. Based on available data, the classification criteria are not met.

Aspiration hazard

- Not applicable as cements are not used as an aerosol

Portland cement clinker and common cements have the same toxicological and eco-toxicological properties.

Medical conditions aggravated by exposure

Inhaling cement dust may aggravate existing respiratory system disease(s) and/or medical conditions such as emphysema or asthma and/or existing skin and/or eye conditions.

12. Ecological information

12.1 Toxicity

The product is not hazardous to the environment. Ecotoxicological tests with Portland cement on Daphnia magna (water flea species) [Reference (4)] and Selenastrum coli (species of algae) [Reference (5)] have shown little toxicological impact. Therefore LC50 and EC50 values could not be determined [Reference (7)]. There is no indication
of sediment phase toxicity [Reference (8)]. The addition of large amounts of cement to water may, however, cause a rise in pH and may, therefore, be toxic to aquatic life under certain circumstances.

12.2 Persistence and degradability
Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks.

12.3 Bioaccumulative potential
Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks.

12.4 Mobility in soil
Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks

12.5 Results of PBT and vPvB assessment
According to Annex XIII of Regulation (EC) No 1907/2006 – REACH cement is neither persistent, bioaccumulative toxin (PBT), nor very persistent and very bioaccumulative (vPvB).

12.6 Other adverse effects - Not relevant.

13. Disposal considerations

13.1 Waste treatment methods

<table>
<thead>
<tr>
<th>Treatment Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product – cement that has exceeded its shelf life</strong></td>
<td>Do not dispose of into sewage systems or surface waters. <strong>Product – cement that has exceeded its shelf life</strong> (and when demonstrated that it contains more than 0.0002% soluble Cr (VI)): shall not be used/sold other than for use in controlled closed and totally automated processes or should be recycled or disposed of according to local legislation or treated again with a reducing agent.</td>
</tr>
<tr>
<td><strong>Product - unused residue or dry spillage</strong></td>
<td>Pick up dry unused residue or dry spillage as is. Mark the containers. Possibly reuse depending upon shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to “Product – after addition of water, hardened”.</td>
</tr>
<tr>
<td><strong>Product - slurries</strong></td>
<td>Allow to harden, avoid entry in sewage and drainage systems or into bodies of water (e.g. streams) and dispose of as explained below under “Product - after addition of water, hardened”.</td>
</tr>
<tr>
<td><strong>Product - after addition of water, hardened</strong></td>
<td>Dispose of according to the local legislation. Avoid entry into the sewage water system. Dispose of the hardened product as concrete waste. Due to the inertisation, concrete waste is not a dangerous waste.</td>
</tr>
</tbody>
</table>

**EWC /European Waste Catalogue/ entries:**
- 10 13 14 (waste from manufacturing of cement – waste concrete or concrete sludge) or
- 17 01 01 (construction and demolition wastes – concrete).

**Packaging**
- Completely empty the packaging and process it according to local legislation.
- **EWC entry:** 15 01 01 (waste paper and cardboard packaging).
### 14. Transport information
Cement is not covered by the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID), therefore no classification is required. No special precautions are needed apart from those mentioned under Section 8.

<table>
<thead>
<tr>
<th>14.1. UN number</th>
<th>Not relevant.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2. UN proper shipping name</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>14.3. Transport hazard class(es)</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>14.4. Packing group</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>14.5. Environmental hazards</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>14.6. Special precautions for user</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
<td>Not relevant.</td>
</tr>
</tbody>
</table>

### 15. Regulatory information

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Cement is a mixture according to REACH and is not subject to registration. Cement clinker is exempt from registration (Art 2.7 (b) and Annex V.10 of REACH). Kiln dust from manufacture of cement clinker is registered under REACH and the exposure scenario is detailed in an Annex to this SDS. The marketing and use of cement is subject to a restriction on the content of soluble Cr (VI) (REACH Annex XVII point 47 Chromium VI compounds):  
1. Cement and cement-containing mixtures shall not be placed on the market, or used, if they contain, when hydrated, more than 2 mg/kg (0.0002 %) soluble chromium VI of the total dry weight of the cement.  
2. If reducing agents are used, then without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of cement or cement-containing mixtures is visibly, legibly and indelibly marked with information on the packing date, as well as on the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below the limit indicated in paragraph 1.  
3. By way of derogation, paragraphs 1 and 2 shall not apply to the placing on the market for, and use in, controlled closed and totally automated processes in which cement and cement-containing mixtures are handled solely by machines and in which there is no possibility of contact with the skin.

#### 15.2 Chemical Safety Assessment
No chemical safety assessment has been carried out.

### 16. OTHER INFORMATION

| Indication of changes | This Safety Data Sheet complies with Annex I of Regulation (EO) 453/20.05.2010 r |
### Key data sources for this SDS:
- Regulation № 13/30.12.2003 on workers’ protection from risks associated with exposure to chemical agents at work:
  - Company instructions, reports, protocols.
- IUCLID Dataset - Natural gas condensates - European Commission - European Chemical Bureau

### Legal framework:
- Law of protection from the harmful impact of chemical substances and mixtures;
- Ordinance on classification, labelling and packaging of chemical substances and mixtures;
- Regulation (EO) 1907/2006 (REACH);
- Regulation (EO) № 1272/2008 (CLP);
- Regulation (EO) 453/20.05.2010 containing basic SDS requirements

### Abbreviations and acronyms:
- ADR/RID - European Agreements on the transport of Dangerous goods by Road/Railway
- APF - Assigned protection factor
- CAS - Chemical Abstracts Service
- CLP - Classification, labelling and packaging – Regulation EC 1272/2008
- COPD - Chronic Obstructive Pulmonary Disease
- DNEL - Derived no-effect level
- EC50 - Half maximal effective concentration
- ECHA - European Chemical Agency
- EINECS - European INventory of Existing Commercial chemical Substances
- EPA - Type of high efficiency air filter
- ES - Exposure Scenario
- EWC - European Waste Catalogue
- FF P - Filtering facepiece against particles (disposable)
- FM P - Filtering mask against particles with filter cartridge
- GefStoffV – Gefahrstoffverordnung
- HEPA - Type of high efficiency air filter
- H&S - Health & Safety
- IATA - International Air Transport Association
- IMDG - International agreement on the Maritime transport of Dangerous Goods
- MEASE - Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux /European metals association/
- MS - Member state
- OELV - Occupational exposure limit value
- PBT - Persistent, bioaccumulative and toxic
- PNEC - Predicted no-effect concentration
- PROC - Process category
- RE – Repeated exposure
- REACH - Registration, Evaluation and Authorization of Chemicals
- RPE - Respiratory protective equipment
- SCOEL - Scientific Committee on Occupational Exposure Limit Values
- SDS - Safety Data Sheet
- SE - Single exposure
- STOT - Specific target organ toxicity
- TLV-TWA - Threshold Limit Value-Time-Weighted Average
- TRGS - Technische Regeln für Gefahrstoffe
- VLE-MP - Exposure limit value-weighted average in mg by cubic meter of air
- vPvB - Very persistent, very bioaccumulative
Key literature references and sources of data


9. TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.


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.


MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux,..


<table>
<thead>
<tr>
<th>R phrases</th>
<th>Skin Irrit. 2, H315</th>
<th>Serious eye dam. 1, H318</th>
<th>Skin sens. 1B, H317</th>
<th>STOT SE. 3, H335</th>
</tr>
</thead>
<tbody>
<tr>
<td>R37/38</td>
<td>Irritating to respiratory system and skin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R 41</td>
<td>Risk of serious damage to eyes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R 43</td>
<td>May cause sensitisation by skin contact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R 48/20</td>
<td>Harmful: danger of serious damage to health by prolonged exposure through inhalation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition to health, safety and environmental training programs for their workers, companies must ensure that workers read, understand and apply the requirements of this SDS.

Methods and test data used for the classification of common cements are given or specified in 11.1.

On basis of test data

On basis of test data

Human experience

Human experience

The information on this data sheet reflects the currently available knowledge and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product, including the use of the product in combination with any other product or any other process, is the responsibility of the user. The user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.

= THE END =