

## GUIDELINES FOR THE SAFETY DATA SHEET TEMPLATE FOR COMMON CEMENTS

Version 2.2

15 December 2014

### Introduction

In December 2008, a comprehensive new system for the classification, labelling and packaging of hazardous substances and mixtures entered into force in the EU (CLP Regulation). This new system has also induced changes in the safety datasheets for hazardous substances and mixtures.

This document contains guidelines and a new template for the SDS of Common cements. It was drafted by CEMBUREAU H&S experts from national associations, companies and outside experts covering the following fields of expertise: toxicology, eco-toxicology, medicine, process technical knowledge, quality assurance, law, and industrial hygiene. Some experts followed specific training in developing SDS. As such, this group fulfils the definition of “competent person” as given in the ECHA guidance on the SDS.

The first part of this document contains explanations for some of the specific sections of the template for the SDS. The template itself is the second part of this document.

Mixtures must be classified, labelled and packaged according to the new CLP ([Regulation \(EC\) No 1272/2008](#)) as of 1 June 2015. Before that day, mixtures should be classified, labelled and packaged according to the Dangerous Preparations Directive ([Council Directive 1999/45/EC](#)). However, manufacturers or importers may decide to follow the CLP Regulation prior to 1 June 2015. If this is the case, the SDS must also contain the classification under the old system of the Dangerous preparations Directive until 31 May 2015.

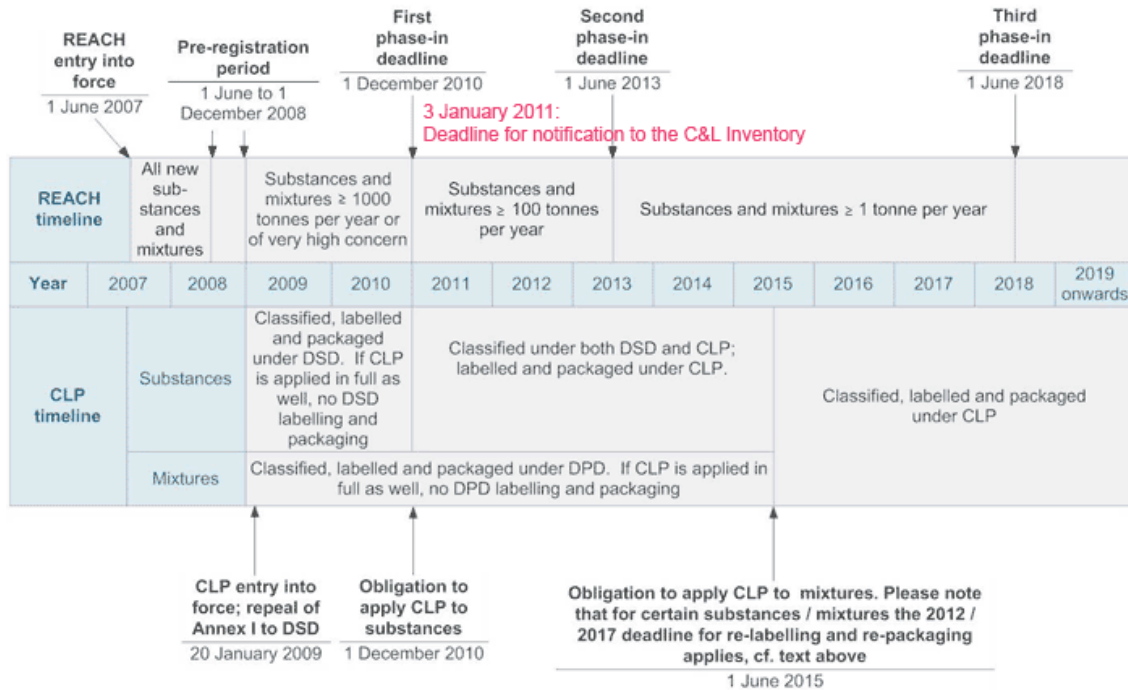
Before the date on which manufacturers or importers decide to follow the CLP Regulation, they should classify, label and package Common cements according to the Dangerous Preparations Directive and follow the previous version of the template for the SDS of Common cements attached below:



ECHA Guidance SDS\_en Feb 2014.pdf

More information about the CLP Regulation can be found from ECHA's website: [http://echa.europa.eu/clp\\_en.asp](http://echa.europa.eu/clp_en.asp).

The graph below gives an overview of the timelines for the application of the CLP Regulation:



Together with the new system for classification and labelling, a new SDS format was introduced by the legislator. It is given in the amended Annex II of REACH ([Commission Regulation \(EU\) 453/2010](#)).

The REACH Regulation itself can be downloaded from [this web page](#) (please see the consolidated versions for all the amendments to REACH).

The ECHA guidance document on the compilation of SDS is available from this link: [http://echa.europa.eu/documents/10162/13643/sds\\_en.pdf](http://echa.europa.eu/documents/10162/13643/sds_en.pdf).

CEMBUREAU also prepared the attached document with the labelling elements which under the CLP Regulation should be used on the bags of cement. The labelling elements follow from the unique classification of Portland cement clinker and of Common cements which was adopted by the CEMBUREAU Board. The document also gives an overview of the arguments on which the classification is based and of the voluntary labelling elements which the European cement industry agreed to use for cement.



T20676 C&L clinker - cement - CLP update

## Explanations for some of the sections of the template SDS

The text between square brackets and in italic blue [*text*], contains instructions for the parts which need to be adapted by the manufacturer/importer.

### 1.1 Product identifier

The trade name or designation of the mixture should be given. The identifier on the label and in the SDS should be the same.

Note: some Member State Competent Authorities may require manufacturers or importers to give a full list of ingredients of a mixture in section “1.1 Product Identifier”, including those which are not classified as dangerous. But this requirement is not covered by ECHA guidance documents.

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

This section needs to be completed with the information from the ES of the substances in cement, subject to registration and for which a chemical safety assessment was made. See also the explanation under 16.6. If the information from the ES is not fully included in the SDS, the ES need to be added to the SDS as an annex.

### 2.1. Classification of the substance or mixture

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

CEMBUREAU recommends giving the full hazard and precautionary statements in this section, instead of referring to the full statements in section 16.

#### 2.1.2 According to Directive 1999/45/EC

This section must be included only until 31 May 2015. As of 1 June 2015, only the classification according to Regulation (EC) No 1272/2008 shall be given.

## 2.2. Label elements

The label elements given in this section must be consistent with the label affixed to the product.

Hence, the label elements according to the CLP Regulation must be given as of the date on which the cement is classified according to that Regulation.

### ***According to Regulation (EC) No 1272/2008***

P501 Dispose of contents/container to ... in accordance with local/regional/national/international regulation (to be specified).

This sentence needs to be completed by manufacturer/importer with the requirements in accordance with local/regional/national/international regulation, e.g., through the national implementation of Directive 2004/12/EC on packaging and packaging waste, amending Directive 94/62/EC or other measures.

If the nominal quantity of Common cements in the package is not mentioned on the package made available to the general public, then the manufacturer/importer must mention this quantity on the label. In the latter case, the quantity must also be added to the section 2.2 of the SDS as one of the labelling elements.

“H317 May cause an allergic skin reaction” is not used in Germany and some other countries as the authorities did not accept this to be used for chromate reduced cements.

### ***Supplemental information to be added by the manufacturer/importer as applicable***

Unless cements or cement mixtures are already classified and labelled as a sensitiser with the hazard statement “H317 May cause an allergic skin reaction”, the label on the packaging of cements and cement mixtures that contain, when they are hydrated, more than 0,0002 % soluble chromium (VI) of the total dry weight of the cement shall bear the statement:

EUH203 — ‘Contains chromium (VI). May produce an allergic reaction’

If reducing agents are used, then the packaging of cement or cement-containing mixtures shall include information on the packing 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.

### 3.2. Mixtures

This subsection should list all the substances in the specific cement (including reducing agents and other chemical additives):

- a) Which present a health or environmental hazard and are present in cement in concentrations above the concentrations given in the table below:

Hazard class and categories of the substance	Threshold (% w/w)
Acute toxicity Cat. 1, 2 and 3	≥ 0.1%
Acute toxicity Cat. 4	≥ 1.0%
Skin corrosion/irritation Cat. 1A, 1B, 1C and 2	≥ 1.0%
Serious damage to eyes/eye irritation Cat. 1 and 2	≥ 1.0%
Sensitisation (respiratory tract)	≥ 0.1%
Sensitisation skin 1	≥ 1.0%
Sensitisation skin 1A	≥ 0.1%
Sensitisation skin 1B	≥ 1.0%
Germ cell mutagenicity 1A and 1B	≥ 0.1%
Germ cell mutagenicity Cat. 2	≥ 1%
Carcinogenicity Cat. 1A, 1B and 2	≥ 0.1%
Reproductive toxicity Cat. 1A, 1B, 2 and effects via or on lactation	≥ 0.1%
STOT SE Cat. 1 and 2	≥ 1.0%
STOT RE Cat. 1 and 2	≥ 1.0%
Aspiration hazard	≥ 10.0%
Acute aquatic toxicity Cat. 1	≥ 0.1%
Chronic aquatic toxicity Cat. 1	≥ 0.1%
Chronic aquatic toxicity Cat. 2, 3 and 4	≥ 1.0%
Hazardous for the ozone layer	≥ 0.1%

- b) For which there are Community workplace exposure limits, not already included under a),
- c) Which are PBT or vPvB in accordance with the criteria set out in Annex XIII to REACH Regulation

The product identifier, concentration or concentration ranges and classification shall be provided in descending order.

The table below contains an indicative list of substances to be listed in this section, but the manufacturer/importer needs to adapt it to his specific cement:

Constituent	% [weight]	EC No.	CAS No.	REACH Registration No. °	Classification according to 67/548/EEC **	Classification according to (EC) No. 1272/2008 (CLP)	
Portland cement clinker	5 - 100	266-043-4	65997-15-1	exempted from registration	irritant: Xi R37/38 R41 R43	Skin Irrit. 2 Skin Sens. 1B Eye Dam. 1 STOT SE 3	H315 H317 H318 H335
Flue Dust	0,1 - 5	270-659-9	68475-76-3	01-2119486-767-17-xxxx	irritant: Xi R37/38 R41 R43	Skin Irrit. 2 Skin Sens. 1B Eye Dam. 1 STOT SE 3	H315 H317 H318 H335
Burnt shale * oil	x - y ‡	297-648-1	93685-99-5	01-2119703-178-42-xxxx	harmful: Xn R48/20 R37 R41	STOT RE 2 STOT SE 3 Eye Dam. 1	H373 H335 H318
Quartz, fine fraction	x - y						
other #							

*Typically, the content is below 1 M.-% for standard cements. Therefore, it is not necessary to include quartz in this table*

- ° Individual part of registration number may be omitted by the supplier of the mixture provided that:
- this supplier assumes the responsibility to provide the full registration number upon request for enforcement purposes, or, if the full registration number is not available to him, to forward the request to his supplier, in line with point (b).; and
  - this supplier provides the full registration number to the Member State authority responsible for enforcement (hereinafter referred to as the "enforcement authority") within 7 days upon request, received either directly from the enforcement authority or forwarded by his recipient, or, if the full registration number is not available to him, this supplier shall forward the request to his supplier within 7 days upon request and at the same time inform the enforcement authority thereof.
- \*\* This does not apply to imported mixtures  
This column needs to be given up to 31 may 2015 only. As of 1 June 2015, it needs to be deleted
- \* A variety of different grades of "burnt shale" were registered. These different grades have different classifications depending on mineralogy, granulometry and respirable crystalline silica content. The burnt shale which is used in cement (2-25% free lime, 1-25% calcite and 1-25% quartz) has the classification given in this table. If cement manufacturers use another type of burnt shale in cement, they need to adapt the above classification.
- ‡ The max amount of Burnt oil shale added to cement is such that the content of RCS in the cement does not exceed 1%
- # any other constituent fulfilling the requirements (see above)

The table from the EN 197-1 standard on Common cement types can be adapted to the individual needs of the company.

Any further standards applicable to the product (national or for specific cement properties) should be given here as well.

For other non-common cement types, the template may need further adaptation.

## 8.1. Control parameters

This section should list, where available, the national limit values (occupational or biological limit values or other), including the legal base for each of them, currently applicable in the MS where the SDS is provided. When listing occupational exposure limit values, the chemical identity as specified in Section 3 shall be used. If no limit values are available for cement, then the values for general dust can be given.

Some examples of control parameters are given below.

Name – limit value	Limit value type	Value (as 8 h TWA)	Unit	Legal reference
<b>France</b>				
General dust	OELV total inhalable dust*	10	mg/m <sup>3</sup>	Article R.4222-10 of Occupational Code
General dust	OELV alveolar fraction*	5	mg/m <sup>3</sup>	Article R.4222-10 of Occupational Code
<b>Germany</b>				
General dust	OELV total inhalable dust	10	mg/m <sup>3</sup>	Working place limit values
General dust	OELV alveolar dust	1,25	mg/m <sup>3</sup>	Working place limit values
<b>Portugal</b>				
Cement dust	VLE-MP total inhalable dust	10	mg/m <sup>3</sup>	
Cement dust	VLE-MP alveolar dust	3	mg/m <sup>3</sup>	

\* Dust reputedly without any specific effects

Note: alveolar = respirable

Information on the currently recommended monitoring procedures shall be given.

The template for the SDS contains the engineering controls and individual protection measures for an inhalation DNEL of 3 mg/m<sup>3</sup>. In the Annex to this document, tables with engineering controls and individual protection measures for inhalation DNELs of 1 mg/m<sup>3</sup> and 5 mg/m<sup>3</sup> are given so that the tables in the template of the SDS can be adapted to the specific national situation (OELV) if necessary.

## 8.2. Exposure controls

### 8.2.2 Individual protection measures such as personal protection equipment

#### *Skin protection*

If required, the following information can be given in this paragraph:

Examinations have shown that nitrile soaked cotton gloves (layer thickness ca. 0.15 mm) with CE marking, internally lined with cotton, offer over a period of 480 min sufficient protection. Change wet gloves. Ready hold gloves for change.

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

To be completed by the manufacturer/importer: any relevant national measures applicable to Common cements: e.g. for Germany, content from TRGS, GefStoffV.

## 16.3 Abbreviations and acronyms

If used in section 3.2 and not written in full, the R phrases listed below should be added to the list of abbreviations in section 16.3

R37/38 Irritating to respiratory system and skin

R41 Risk of serious damage to eyes

R43 May cause sensitisation by skin contact

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation

## 16.7 Further information

The content of the SDS needs to be in line with the information from the exposure scenarios (received from the suppliers) of substances subject to registration and classified as dangerous and which are present in the Common cement. In particular, according to the new format of the SDS ([Commission Regulation \(EU\) 453/2010](#) amending Annex II of REACH,

and [guidance document on extended SDS](#) (see part G)), the content of the ES, the uses, the so-called operational conditions and the risk management measures have to be included in sections 1.2, 7 and 8 (and possibly in section 13 – waste) of the SDS. It is not necessary to add the ES of the individual substances to the SDS, unless the mixture is used under different operational conditions or the uses require different risk management measures. In the latter case, the ES have either to be consolidated in ES relevant for the downstream user and annexed to the SDS or the relevant ES should be annexed as such to the SDS.

The information from the ES of flue dust from cement clinker production has been incorporated in this template for the SDS of Common cements. If applicable, further information from the ES of the following substances (non-exhaustive list) needs to be added to the SDS or the ES need to be added as an annex to the SDS:

- Burnt oil shale
- Admixtures



# Safety Data Sheet according to Regulation (EC) No 1907/2006 (REACH) [Template SDS Common cements]

Product: [Trade name]

[Revised] Version 2 / EN of [date]

Replaces all previous versions

Print date: [date]

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

### 1.1 Product identifier

[Trade name or designation to be completed by the manufacturer/importer]

[Own company identifiers may be added such as names by which mixture is commonly known, numbers, company product codes, other unique identifiers] See also page 3 of the template.

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

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). See section 16.2 for more information regarding use descriptors and categories.

Any uses not mentioned above, are advised against.

[This section needs to be completed with the information from the ES of the substances in cement, subject to registration and for which a chemical safety assessment was made. The information from the ES of flue dust has already been included above. If the information is not included in the SDS, then reference is to be made to ES which need to be attached in Annex]

### 1.3. Details of the supplier of the safety data sheet

[To be completed by the manufacturer or importer]

[If the supplier is not located in the MS where the cement is placed on the market and he has nominated a responsible person for that MS, the full address and telephone number of that responsible person shall be given]

[If an Only Representative has been nominated (for the substances in the mixture cement and subject to registration), details of non-community manufacturer or formulator may also be provided]

Company name:

Full address:

Telephone number:

E-mail address of person responsible for the SDS:

[It is recommended to use a generic email address that can be checked by different persons. There is no requirement to mention the name of a physical person in the SDS and this person does not need to be located within the territory of the EU or the EEA]

National contact: [Optional, if applicable]

### 1.4. Emergency telephone number

[From official advisory body if it exists, e.g. according to Art. 45 of CLP or from company, to be completed by manufacturer/importer]

Emergency telephone number:

Hours of operation: [To be completed if applicable]

Information provided will be limited to: [To be completed if applicable]

Service is provided in the following language:

[It is recommended to have an emergency telephone number available 24h/7 days]

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## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

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

*[If the product is labelled according to CLP. Otherwise this classification is voluntarily until 31 May 2015 and has to be included in SECTION 16]*

Hazard class	Hazard category	Hazard statements
Skin irritation	2	H315: Causes skin irritation
Serious eye damage/eye irritation	1	H318: Causes serious eye damage
Skin sensitisation	1B	H317: May cause an allergic skin reaction
Specific target organ toxicity single exposure respiratory tract irritation	3	H335: May cause respiratory irritation

#### 2.1.2 According to Directive 1999/45/EC

*[To be included until 31 May 2015]*

Xi Irritant  
R37/38 Irritating to respiratory system and skin  
R41 Risk of serious damage to eyes  
R43 May cause sensitisation by skin contact

### 2.2. Label elements

#### According to Regulation (EC) No 1272/2008 (CLP)

##### Hazard pictograms



*Note: Not to be included if national authorities do not accept it!*

##### Signal word

Danger

##### Hazard statements

H318 Causes serious eye damage  
H315 Causes skin irritation  
H317 May cause an allergic skin reaction  
H335 May cause respiratory irritation

##### Precautionary statements

P102 Keep out of reach of children  
P280 Wear protective gloves/protective clothing/eye protection/face protection  
P305+P351+P338+P310: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician  
P302+P352+P333+P313: IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention  
P261+P304+P340+P312: Avoid breathing dust/fume/gas/mist/vapours/spray. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

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P501 Dispose of contents/container to ...[To be completed by the manufacturer/importer]

### **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**

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

*[If the cement contain a chromate agent and is not classified as a skin sensitizer than the following phrase shall be used]*

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).

*[If the cement is not classified as a skin sensitizer, and does contain a chromate reducer than the following phrase shall be used (in case of natural low chromate content)]*

Cement dust may cause an allergic reaction in some individuals due to the water soluble Cr(VI) content.

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## **SECTION 3: Composition/information on ingredients**

### **3.1. Substances**

*[Can be empty, or filled with a sentence such as "Not Applicable as the product is a mixture, not a substance"]*

### **3.2. Mixtures**

Common cement types according to the EN 197-1:2011 standard:

*[To be completed by the manufacturer/importer. As a minimum, a list of the hazardous constituents, as described on page 6, has to be added]*

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## **SECTION 4: First aid measures**

### **4.1. Description of first aid measures**

#### **General notes**

No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet cement or wet cement containing mixtures.

#### **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. Avoid flushing particles into uninjured eye. 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 inhalation**

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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.

### **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.

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

**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).

*For more details see Reference (1).*

**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.

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## **SECTION 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.

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

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

#### **6.1.1 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.

#### **6.1.2 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).

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## 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 slurrying 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.

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## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

#### 7.1.1 Protective measures

Follow the recommendations as 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 be found via the following link: <http://www.nepsi.eu/agreement-good-practice-guide/good-practice-guide.aspx>.

#### **Measures to protect the environment**

No particular measures.

#### 7.1.2 Information on 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.

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

Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.

Engulfment hazard: 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. Cement can build up or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

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.

Do not use aluminium containers for the storage or transport of wet cement containing mixtures 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.

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## SECTION 8: Exposure controls/personal protection

*[To be made consistent with ES if applicable, see explanatory note in section 16.7 in the Explanations for some of the sections of the template SDS]*

### 8.1. Control parameters

*[To be completed by the manufacturer/importer in line with national provisions in place in the country where cement is placed on the market: national control parameters such as occupational or biological limit values; or other and monitoring procedures with references to a specific standard if applicable]*

### 8.2. Exposure controls

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.

**Safety Data Sheet** according to Regulation (EC) No 1907/2006 (REACH)  
**[Template SDS Common cements]**

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Use	PROC*	Expo- sure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		A) general ventilation or B) generic local exhaust ventilation	17 % 78 %
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		A) general ventilation or B) generic local exhaust ventilation	17 % 78 %
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) not required or B) generic local exhaust ventilation	- 78 %
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		not required	-
	9, 26		A) not required or B) generic local exhaust ventilation	- 72 %
	5, 8a, 8b, 14		A) not required or B) integrated local exhaust ventilation	- 87 %
	19		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) not required or B) generic local exhaust ventilation	- 72 %	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.



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## 8.2.2 Individual protection measures such as personal protection equipment

### **General**

During work avoid kneeling in fresh mortar or concrete wherever possible. If kneeling is 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 them.

[Add reference to EN standards or other standards where relevant]

### **Eye/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 watertight, wear- and alkali-resistant protective gloves (e.g. nitrile soaked cotton gloves with CE marking) internally lined with cotton; boots; closed long-sleeved protective clothing as well as skin care products (e.g. 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. For the gloves, respect the maximum wearing time to avoid skin problems. In some circumstances, such as when laying concrete or screed, waterproof trousers or kneepads are necessary.

### **Respiratory protection**



When a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection. The type of respiratory protection should be adapted to the dust level and conform to the relevant EN standard (EN 149) or national standard.

### **Thermal hazards**

Not applicable.



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Use	PROC*	Expo- sure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		A) FFP1 or B) not required	APF = 4  -
	5, 8b, 9		A) FFP2 or B) FFP1	APF = 10  APF = 4
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) FFP1 or B) not required	APF = 4  -
	5, 8b, 9		A) FFP2 or B) FFP1	APF = 10  APF = 4
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) FFP1 or B) not required	APF = 4  -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		FFP1	APF = 4
	9, 26		A) FFP2 or B) FFP1	APF = 10  APF = 4
	5, 8a, 8b, 14		A) FFP3 or B) FFP1	APF = 20  APF = 4
	19		FFP2	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) FFP2 or B) FFP1	APF = 10  APF = 4	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.

[For each individual PROC, users must choose option A) or B) in the table above, according to what was chosen in section "8.2.1 Appropriate engineering controls" – localised controls.]

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

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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.

*[To be adapted by the manufacturer/importer in accordance with national standards if applicable]*

## 8.2.3 Environmental exposure controls

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.

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.

*[Information required by the employer to fulfil his commitments under Community environmental legislation is to be provided]*

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## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

This information applies to the whole mixture.

- (a) Appearance: Dry cement is a finely ground solid inorganic material (grey or white powder). Main particle size: 5-30 µm
- (b) Odour: Odourless
- (c) Odour threshold: No odour threshold, odourless
- (d) pH: (T = 20°C in water, water-solid ratio 1:2): 11-13.5
- (e) Melting point: > 1 250 °C
- (f) Initial boiling point and boiling range: Not applicable as under normal atmospheric conditions, melting point >1 250°C
- (g) Flash point: Not applicable as is not a liquid
- (h) Evaporation rate: Not applicable as is not a liquid
- (i) Flammability (solid, gas): Not applicable as is a solid which is non combustible and does not cause or contribute to fire through friction
- (j) Upper/lower flammability or explosive limits: Not applicable as is not a flammable gas
- (k) Vapour pressure: Not applicable as melting point > 1250 °C
- (l) Vapour density: Not applicable as melting point > 1250 °C
- (m) Relative density: 2.75-3.20; Apparent density: 0.9-1.5 g/cm<sup>3</sup>
- (n) Solubility(ies) in water (T = 20 °C): slight (0.1-1.5 g/l)
- (o) Partition coefficient: n-octanol/water: Not applicable as is inorganic mixture
- (p) 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)
- (q) Decomposition temperature: Not applicable, as no organic peroxide present
- (r) Viscosity: Not applicable, as not a liquid
- (s) 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.
- (t) Oxidising properties: Not applicable as does not cause or contribute to the combustion of other materials

### 9.2. Other information

Not applicable.

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## SECTION 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, manganese trifluoride, and oxygen difluoride.

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**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.

**SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

Hazard class	Cat	Effect	Reference
Acute toxicity - dermal	-	Limit test, rabbit, 24 hours contact, 2,000 mg/kg body weight – no lethality. Based on available data, the classification criteria are not met.	(2)
Acute toxicity- inhalation	-	No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met.	(9)
Acute toxicity - oral	-	No indication of oral toxicity from studies with cement kiln dust. Based on available data, the classification criteria are not met.	Literature survey
Skin corrosion/ irritation	2	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.	(2) Human experience
Serious eye damage/irritation	1	Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128. Common cements contain varying quantities of Portland cement clinker, fly ash, blast furnace slag, gypsum, natural pozzolans, burnt shale, silica fume and limestone. 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.	(10), (11)
Skin sensitisation	1B	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. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis and is a combination of the two above mentioned mechanisms. If the cement contains a soluble Cr (VI) reducing agent and as long as the mentioned period of effectiveness of the chromate reduction is not exceeded, a sensitising effect is not expected [Reference (3)].	(3), (4), (17)
Respiratory sensitisation	-	There is no indication of sensitisation of the respiratory system. Based on available data, the classification criteria are not met.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met.	(12), (13)

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Hazard class	Cat	Effect	Reference
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.). Based on available data, the classification criteria are not met.	(1)  (14)
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience
STOT-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.	(1)
STOT-repeated exposure	-	There is an indication of COPD. 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.	(15)
Aspiration hazard	-	Not applicable as cements are not used as an aerosol.	

Apart from skin sensitisation, Portland cement clinker and Common cements have the same toxicological and eco-toxicological properties.

*[If available and if different from the information given above for Common cements, the relevant toxicological properties of the hazardous substances in the mixture other than clinker shall also be given, in particular the toxicological information of substances in the mixture and which have been registered should be given]*

## **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.

## **SECTION 12: Ecological information**

*[Information to be added for all substances listed in section 3 by the manufacturer/importer]*

### **12.1. Toxicity**

The product is not hazardous to the environment. Ecotoxicological tests with Portland cement on *Daphnia magna* [Reference (5)] and *Selenastrum coli* [Reference (6)] 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. After hardening, cement presents no toxicity risks.

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**12.3. Bioaccumulative potential**

Not relevant. After hardening, cement presents no toxicity risks.

**12.4. Mobility in soil**

Not relevant. After hardening, cement presents no toxicity risks.

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

Not relevant. After hardening, cement presents no toxicity risks.

**12.6. Other adverse effects**

Not relevant.

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**SECTION 13: Disposal considerations**

**13.1. Waste treatment methods**

Do not dispose of into sewage systems or surface waters.

***Product - cement that has exceeded its shelf life***

EWC entry: 10 13 99 (wastes not otherwise specified)

(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.

***Product - unused residue or dry spillage***

EWC entry: 10 13 06 (Other particulates and dust)

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"

***Product – slurries***

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".

***Product - after addition of water, hardened***

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.

**EWC 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).

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**SECTION 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.

**14.1. UN number**

Not relevant

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**14.2. UN proper shipping name**

Not relevant

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

Not relevant

**14.4. Packing group**

Not relevant

**14.5. Environmental hazards**

Not relevant

**14.6. Special precautions for user**

Not relevant

**14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**

Not relevant

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**SECTION 15: Regulatory information**

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

**EU regulatory information**

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).

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).

**National regulatory information**

*[To be completed by the manufacturer/importer: any relevant national measures applicable to Common cements].*

**15.2. Chemical Safety Assessment**

No chemical safety assessment has been carried out for this mixture by the supplier.

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**SECTION 16: Other information**

**16.1 Indication of changes**

*[Version history and main changes to SDS to be completed by the manufacturer/importer]*

**16.2 Identified uses and use descriptors and categories**

The table below gives an overview of all relevant identified uses of cement or cement containing hydraulic binders. All the uses have been grouped in these identified uses because of the specific conditions of exposure for human health and environment. For each specific use, a set of risk management measures or localised controls has been derived (see section 8) which need to be put in place by the user of cement or cement containing hydraulic binders to bring the exposure to an acceptable level.



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PROC	Identified Uses - Use Description	Manufacture/ Formulation of building and construction materials	Professional/ Industrial use of building and construction materials
<b>2</b>	Use in closed, continuous process with occasional controlled exposure, eg industrial or professional manufacture of hydraulic binders	<b>X</b>	<b>X</b>
<b>3</b>	Use in closed batch process, eg industrial or professional manufacture of ready-mix concrete	<b>X</b>	<b>X</b>
<b>5</b>	Mixing or blending in batch process for formulation of mixtures and articles, eg industrial or professional manufacture of pre-cast concrete	<b>X</b>	<b>X</b>
<b>7</b>	Industrial spraying, eg industrial use of wet suspensions of hydraulic binders by spraying		<b>X</b>
<b>8a</b>	Transfer of substance or mixture from/to vessels/large containers at non-dedicated facilities, eg use of cement in bags to prepare mortar		<b>X</b>
<b>8b</b>	Transfer of substance or mixture from/to vessels/large containers a dedicated facilities, eg filling of silos, trucks or barges at cement plants	<b>X</b>	<b>X</b>
<b>9</b>	Transfer of substance or mixture into small containers, eg filling of cement bags in cement plants	<b>X</b>	<b>X</b>
<b>10</b>	Roller application or brushing, eg products to improve adherence between building surfaces and finishing products		<b>X</b>
<b>11</b>	Non-Industrial spraying, eg professional use of wet suspensions of hydraulic binders by spraying		<b>X</b>
<b>13</b>	Treatment of articles by dipping and pouring, eg covering of construction products with a layer to improve the performance of the product		<b>X</b>
<b>14</b>	Production of mixtures or articles by tableting, compression extrusion, pelletisation, eg production of floor tiling	<b>X</b>	<b>X</b>
<b>19</b>	Hand-mixing with intimate contact and only PPE available, eg mixture of wet hydraulic binder on a construction site		<b>X</b>
<b>22</b>	Potentially closed processing operations with minerals/metals at elevated temperature in industrial setting, eg production of bricks		<b>X</b>
<b>26</b>	Handling of solid inorganic substances at ambient temperature, eg mixture of wet hydraulic binders	<b>X</b>	<b>X</b>

### 16.3 Abbreviations and acronyms

ACGIH	American Conference of Industrial Hygienists
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) No 1272/2008)
COPD	Chronic Obstructive Pulmonary Disease
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
ECHA	European Chemicals Agency
EINECS	European INventory of Existing Commercial chemical Substances



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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 and Safety
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous GoodsLC50Median lethal dose
MEASE	Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <a href="http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php">http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php</a>
MS	Member State
OELV	Occupational exposure limit value
PBT	Persistent, bio-accumulative and toxic
PNEC	Predicted no-effect concentration
PROC	Process category
RE	Repeated exposure
REACH	Registration, Evaluation and Authorisation of Chemicals
RPE	Respiratory protective equipment
SCOEL	Scientific Committee on Occupational Exposure Limit Values
SDS	Safety Data Sheet
SE	Single exposure
STP	Sewage treatment plant
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 bio-accumulative
w/w	Weight by weight
WWTP	Waste water treatment plant

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#### 16.4 Key literature references and sources of data

- (1) *Portland Cement Dust - Hazard assessment document EH75/7*, UK Health and Safety Executive, 2006. Available from: <http://www.hse.gov.uk/pubns/web/portlandcement.pdf>.
- (2) *Observations on the effects of skin irritation caused by cement*, Kietzman et al, *Dermatosen*, 47, 5, 184-189 (1999).
- (3) *European Commission's Scientific Committee on Toxicology, Ecotoxicology and the Environment (SCTEE) opinion of the risks to health from Cr (VI) in cement* (European Commission, 2002). [http://ec.europa.eu/health/archive/ph\\_risk/committees/sct/documents/out158\\_en.pdf](http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf).
- (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.
- (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.
- (10) TNO report V8815/09, *Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test*, April 2010.
- (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*, Van Berlo et al, *Chem. Res. Toxicol.*, 2009 Sept; 22(9):1548-58.
- (13) *Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung 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 Nordby, 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/industrial-chemicals-reach/projects-and-references/mease.php>.

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(17) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

## 16.5 Relevant R-phrases and/or H-Statements

R37/38 Irritating to respiratory system and skin  
R41 Risk of serious damage to eyes  
R43 May cause sensitisation by skin contact  
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation

## 16.6 Training advice

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.

## 16.7 Further information

See Annex(es) for the ES of the following substances:

[If applicable (see 'Explanations for some of the sections of the template SDS'), the manufacturer/importer can annex the ES of the relevant substances subject to registration and classified as dangerous, if the information is not already contained in the template]

The data and test methods used for the purpose of classification of Common cements are given or referred to in section 11.1.

## 16.8 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to Regulation (EC) No. 1272/2008	Classification procedure
Skin Irrit. 2, H315	on basis of test data
Eye dam. 1, H318	on basis of test data
Skin sens. 1B, H317	Human experience
STOT SE. 3, H335	Human experience

If this classification is used in section 2.1

## 16.9 Disclaimer

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.

It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.

## Annex: Additional tables with engineering controls and individual protection measures for section 8.2

### 1 Inhalation DNEL of 1 mg/m<sup>3</sup>

#### 8.2.1 Appropriate engineering controls

Use	PROC*	Expo- sure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week); (#) < 240 min	not required	-
	14, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		generic local exhaust ventilation	78 %
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		generic local exhaust ventilation	78%
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) not required or B) generic local exhaust ventilation	- 78 %
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) not required or B) generic local exhaust ventilation	- 72 %
	9, 26		A) not required or B) generic local exhaust ventilation	- 72 %
	5, 8a, 8b, 14		generic local exhaust ventilation	72 %
	19 (#)		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) not required or B) generic local exhaust ventilation	- 72 %	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.

## 8.2.2 Individual protection measures such as personal protection equipment

Use	PROC*	Expo- sure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week); (#) < 240 min	not required	-
	14, 26		A) FFP2 or B) FFP1	APF = 10  APF = 4
	5, 8b, 9		FFP2	APF = 10
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) FFP2 or B) FFP1	APF = 10  APF = 4
	5, 8b, 9		FFP2	APF = 10
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) FFP3 or B) FFP2	APF = 20  APF = 10
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) FFP2 or B) FFP1	APF = 10  APF = 4
	9, 26		A) FFP3 or B) FFP2	APF = 20  APF = 10
	5, 8a, 8b, 14		FFP3	APF = 20
	19 (#)		FFP3	APF = 20
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) FFP3 or B) FFP2	APF = 20  APF = 10	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.

## 2 Inhalation DNEL of 5 mg/m<sup>3</sup>

### 8.2.1 Appropriate engineering controls

Use	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		A) not required or B) generic local exhaust ventilation	- 82 %
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		A) not required or B) generic local exhaust ventilation	- 82 %
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) not required or B) generic local exhaust ventilation	- 78 %
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) not required or B) general ventilation	- 29 %
	9, 26		A) not required or B) generic local exhaust ventilation	- 77 %
	5, 8a, 8b, 14		A) not required or B) generic local exhaust ventilation	- 72 %
	19		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) not required or B) generic local exhaust ventilation	- 77 %	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.

## 8.2.2 Individual protection measures such as personal protection equipment

use	PROC*	Expo- sure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift; 5 shifts a week)	not required	-
	14, 26		A) FFP1 or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 or B) not required	APF = 10 -
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) FFP1 or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 or B) not required	APF = 10 -
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) FFP2 or B) not required	APF = 10 -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) FFP1 or B) not required	APF = 4 -
	9, 26		A) FFP2 or B) not required	APF = 10 -
	5, 8a, 8b, 14		A) FFP3 or B) FFP1	APF = 20 APF = 4
	19		FFP2	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) FFP2 or B) not required	APF = 10 -	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROC's are identified uses and defined in section 16.2.

## Disclaimer

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