

# SAFETY DATA SHEET FOR OIL WELL CEMENT

**Issue date: 02/06/2017**
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## Section 1. IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

**1.1 Product identifier: Oil Well Cement**, conforming to **standard ISO 10426-1/API Spec 10 A**

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

The cement is used as a hydraulic binder for the manufacture of concrete, hydraulic mortar, plaster, etc. Cement, in accordance with the product and chemical/physical requirements of technical standards, is used industrially, by professionals as well as by consumers in building and construction work.

The identified uses of cements and cement containing mixtures (hydraulic binders) include both dry products, and the products in a wet suspension (paste).

PROC	Process categories - Identified uses (use description)	Manufacture / Formulation of building materials	Professional / Industrial use
2	Use in closed, continuous process with occasional controlled exposure	X	X
3	Use in closed batch process (synthesis or formulation)	X	X
5	Mixing or blending in batch process for formulation of preparations and articles (contact in various phases and/or significant contact)	X	X
7	Industrial spraying		X
8a	Transfer of substance or preparation (*) (filling/emptying) from / to vessels /large containers at non-dedicated facilities		X
8b	Transfer of substance or preparation (*) (filling/emptying) from / to vessels /large containers at dedicated facilities	X	X
9	Transfer of substance or preparation (*) into small containers (dedicated filling line, including weighing)	X	X
10	Roller application or brushing		X
11	Non-industrial spraying		X
13	Treatment of articles by dipping and pouring		X
14	Production of preparations (*) or articles by tableting, compression, extrusion, pelletisation	X	X
19	Hand mixing with intimate contact, only using personal protective equipment (PPE)		X
22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		X
26	Handling of solid inorganic substances at ambient temperature	X	X

(\*) N.B.: In order to remain consistent with the descriptors system indicated in IUCLID 5.2, the term "preparation" has not been replaced by the new definition of "mixture" in the table.

### 1.3 Details of the supplier of the Safety Data Sheet (SDS)

**BUZZI UNICEM S.p.A.**  
Via Luigi Buzzi no. 6  
15033 Casale Monferrato (AL), Italy  
tel. +39 0142.416411  
SDS e-mail address: [reach@buzziunicem.it](mailto:reach@buzziunicem.it)

**1.4 Emergency telephone number: +39 0382 24444** - Centro Antiveleni di Pavia (*Pavia Poison Center*)  
(see also Subsection 16.7) Available outside of business hours?  YES 24 hours/day

## Section 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the mixture

*In accordance with Regulation (EC) No. 1272/2008 (CLP)*

Hazard class	Hazard Category	Risk phrases
Skin irritation	2	H315: causes skin irritation
Serious eye damage / irritation	1	H318: causes serious eye damage
Skin sensitisation	1B	H317: may cause an allergic skin reaction
Specific toxicity for target organs (single exposure) - STOT SE, respiratory irritation	3	H335: may cause respiratory irritation

### 2.2 Label elements

*In accordance with Regulation (EC) No. 1272/2008 (CLP)*



#### Warnings

#### Hazard

#### Risk phrases

- H318:** causes serious eye damage
- H315:** causes skin irritation
- H317:** may cause an allergic skin reaction
- H335:** may cause respiratory irritation

#### Safety phrases

- P102:** keep out of reach of children
- P280:** Wear protective gloves/protective clothing/eye protection/face protection.
- P305+P351+P338+P312:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. If you feel unwell, call a Poison Centre or doctor.

<b>P302+P352+ P333+P313:</b>	IF ON SKIN: wash with plenty of soap and water; if skin irritation or rash occurs: Get medical advice/attention.
<b>P261+P304+ P340+P312:</b>	Avoid breathing the dust. IF INHALED: Remove person to fresh air and keep comfortable for breathing If you feel unwell, call a Poison Centre or doctor.
<b>P501:</b>	dispose of product/containers in accordance with current regulations.

## 2.3 Other hazards

In the presence of water, for example when manufacturing concrete or mortar, or when it gets wet, the cement produces a strong alkaline solution (high pH due to the formation of hydroxides of calcium, sodium and potassium).

Frequent inhalation of cement dust over a long period of time increases the risk of developing lung diseases (above all, for repeated and prolonged exposure to dust by some types of cement-based mixtures containing siliceous components – *for more details, see Subsection 15.1*).

Repeated and prolonged contact of cement and/or its pastes on moist skin (due to sweat or humidity) may cause irritation and contact dermatitis *[Reference (4)]*.

Both cement and cement pastes, in case of prolonged contact with the skin, may cause sensitisation due to the presence of trace amounts of chromium (VI) salts; if necessary, this effect can be diminished by adding a specific reducing agent to keep the level of sensitising soluble chromium (VI) below the limit of 0.0002% (2 ppm) of the total dry weight of the ready-to-use cement, according to the legislation specified under Section 15.1 *[Reference (3)]*.

If large amounts are ingested, cement may cause ulcerations of the digestive system.

Under normal conditions of use, cements and cement pastes do not pose particular risks to the environment, as long as the recommendations provided in Sections 6, 8, 12 and 13 are followed.

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

## Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1 Substances

Not applicable.

### 3.2 Mixture

The common cement types are made in accordance with standard ISO 10426-1 (API Specification 10A).

#### 3.2.1 Components presenting a health hazard

Substance	% in peso	EC No.	CAS No.	Registration “REACH” No.	Classification according to Regulation (EC) No. 1272/2008		
					Hazard class	Hazard category	Hazard statements
Portland cement clinker	5÷100	266-043-4	65997-15-1	None (*)	Skin irritation	2	H315
					Skin sensitisation	1B	H317
					Eye damage	1	H318
					STOT SE	3	H335

(\*) **clinker:** C&L Notification No. 02-2119682167-31-0000 dated 15/12/2010; updated on 1/07/2013 with the presentation of Report No. QJ420702-40.

## 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 inhaling cement dust and contact with wet cement or wet cement containing preparations. If this is not possible, first aid workers should use the personal protective equipment described in Section 8.

#### **Following contact with eyes**

Do not rub eyes in order to avoid possible corneal damage by mechanical stress.

Remove contact lenses if any. Incline head to injured eye, open the eyelids 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).

If necessary, contact a specialist of occupational medicine or an eye specialist.

#### **Following skin contact**

For dry cement, remove and rinse abundantly with water.

For wet/damp cement, wash skin with plenty of water and pH neutral soap or a mild detergent. Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before reusing them. Seek medical treatment in all cases of irritation or burns.

#### **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.

#### **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 a Poison Center.

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

**Eyes:** Eye contact with cement dust (dry or wet) may cause serious and potentially irreversible injuries.

**Skin:** Cement and/or cement pastes may have an irritating effect on moist skin (due to sweat or humidity) after prolonged contact or may cause contact dermatitis after repeated and prolonged contact. Furthermore, prolonged skin contact with wet cement and/or wet cement preparations (mortars, concrete, renders, etc.) may cause irritation, serious contact dermatitis or burns.  
*[For more details, see Reference (1)]*

**Inhalation:** Repeated inhalation of cement dust over a long period of time increases the risk of developing lung diseases.

**Ingestion:** Accidental ingestion of cement may cause ulcerations of the mouth and oesophagus.

**Environment:** Under normal use, cement is not hazardous to the environment.

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

See the information provided in Subsection 4.1. When contacting a physician, take the Safety Data Sheet (SDS) with you.

## Section 5. FIRE-FIGHTING MEASURES

### 5.1 Extinguishing media

Cement is not flammable. Therefore, in the event of a fire in the surrounding area, all types of fire extinguishing media may be used.

## 5.2 Special hazards arising from the substance or mixture

Cement is 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. Therefore, there is no need for special protective equipment for the fire-fighters.

## Section 6. ACCIDENTAL RELEASE MEASURES

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

#### 6.1.1 For non-emergency personnel

Wear personal protective equipment (PPE) as described under Section 8 and follow the advice for handling and use given under Section 7.

#### 6.1.2 For emergency responders

Special emergency procedures are not required. However, eye, skin and respiratory protections are needed in situations with high dust levels.

### 6.2 Environmental precautions

Avoid washing cement down sewage and drainage systems or into watercourses.

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

#### Dry cement

Use dry cleanup methods such as vacuum clean-up or vacuum extraction [industrial portable units, equipped with high-efficiency particulate filters or equivalent technology], which do not cause airborne dispersion. Never use compressed air.

Alternatively, wipe up the dust by dampening it and collecting it with a broom or mop.

Where this is not possible, remove by slurring with water (*see: wet cement*).

Ensure that the workers wear appropriate personal protective equipment (see Section 8), in order to prevent inhalation of the cement dust and contact with skin and/or eyes.

Place spilled materials into containers. In the event of large spills of cement, close or cover any water wells located nearby.

#### Wet cement

Clean up wet cement and place in containers. Allow the material to dry and solidify before disposal as described under Section 13.

### 6.4 Reference to other sections

For more details, see Sections 8 and 13.

## Section 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

#### 7.1.1 Protective measures

Follow the recommendations provided under Section 8.

To clean up dry cement, see Subsection 6.3.

#### ***Measures to prevent fire***

No precautions are necessary, as cement is neither combustible nor flammable.

#### ***Measures to prevent aerosol and dust generation***

Do not sweep or use compressed air. Use dry cleanup methods (such as vacuum clean-up and/or vacuum extraction) which do not cause airborne dispersion of the cement dust.

Also follow the recommendations outlined under Subsection 15.1 "Good practice guide".

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

When handling the cement, avoid releasing it into the environment (see also Subsection 6.2).

#### **7.1.2 Information on general occupational hygiene**

At the workplace, do not eat or drink in the areas where cement is handled and/or stored.  
In dusty environments, wear dust masks and protective goggles.  
Use protective gloves to avoid skin contact.

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

Cement must be stored out of the reach of children, far from acids, in appropriate closed containers (storage silos and bags), in a cool, dry location in the absence of ventilation, in order to preserve its technical characteristics and, in any case, prevent the dispersion of dust (see Section 10).

Engulfment hazard: cement can build up or adhere to the walls of a confined space in which it is stored; the cement can release, collapse or fall unexpectedly.

To prevent engulfment or suffocation (during maintenance work or cleaning/unclogging operations), do not enter a confined space – such as a silo, hopper, bulk truck or other storage container or vessel that stores or contains the cement – without adopting specific safety procedures and suitable personal protective equipment.

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

#### **7.3 Specific end uses**

No further information (see also Section 1.2).

#### **7.4 Effectiveness of the soluble chromium (VI) reducing agent**

The integrity of the package and observance of the proper storage procedures described above are essential conditions in order to guarantee the effectiveness of the reducing agent for the period of time specified on the delivery document or on each individual bag.

This time expiration concerns exclusively the activity of the reducing agent in keeping the content of soluble chromium (VI), determined according to the standard EN 196-10, below the limit of 0.0002% of the total dry weight of the ready-to-use cement, required by current legislation (see Section 15), without prejudice to the limits of use of the product imposed by the general rules of storage and use of the product itself.

## **Section 8. EXPOSURE CONTROLS - PERSONAL PROTECTION**

### **8.1 Control parameters**

The threshold limit value for the time-weighted average (TLV-TWA), adopted for workplaces by the American Conference of Governmental Industrial Hygienists (ACGIH) for “Portland cement” particulates is equal to 1 mg/m<sup>3</sup> (respirable fraction). *[for more information, see also Subsection 15.1]*

To assess the **exposure level** (DNEL = derived no-effect level):

- DNEL (respirable fraction): 1 mg/m<sup>3</sup>
- DNEL (dermal): not applicable
- DNEL (oral): not relevant

In contrast, the tool used for the risk assessment [MEASE, *see Reference (17)*] works with the inhalable fraction. Therefore, a further precautionary condition may be implicitly correlated to the risk assessment procedure for occupational exposure.

For workers, no DNEL for dermal exposure are available, neither from human hazard studies nor from human experience. Since cement dust is classified as irritating to skin and eyes, dermal exposure must be minimised as far as technically feasible.

To assess the **environmental risk** (PNEC = predicted no-effect concentration):

- PNEC for water: not applicable
- PNEC for sediment: not applicable

- PNEC for soil: not applicable

The risk assessment of the environmental compartments is based on the resulting pH impact on water. Possible pH changes in surface water, ground water and STP effluent should not increase the value above 9.

## 8.2 Exposure controls

For each Process Category (PROC), the user can choose between options (A) and (B) shown below in Table 8.2.1, depending on the relevant plant situation.

After selecting an option, it must also be selected in Table 8.2.2 of Section 8.2.2 “Individual protection measures such as personal protective equipment (PPE) – Specifications for respiratory protection equipment”; therefore, only combinations between (A)-(A) and (B)-(B) are possible.

### 8.2.1 Appropriate engineering controls

In the installations where cement is handled, transported, loaded, unloaded and stored, suitable hygienic and protective measures must be adopted to protect the workers and for the containment of the dust emission into the work environments, as specified in the table below (evaluated for a DNEL value = 1 mg/m<sup>3</sup>).

Table 8.2.1

Exposure scenario	PROC (*)	Exposure	Localised controls (**)	Efficiency
Industrial production / 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 and 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 suspensions 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 uses of dry hydraulic building and construction materials (indoor and 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. The processes may be carried out only in well-ventilated areas or outdoors.	-
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	-	

(\*) The PROCs are identified uses, as defined in Section 1.2.

(\*\*) The localised controls must be defined based on the effective plant-engineering situation, and then the personal protective equipment, specified in the table in Subsection 8.2.2, will be identified accordingly.



## 8.2.2 Individual protection measures such as personal protective equipment (PPE)

**General:** Do not eat, drink or smoke when working with the cement in order to avoid contact with skin or mouth.

Remove contaminated clothing, footwear, glasses and clean thoroughly before re-using them. When handling cement, use the PPE specified below; immediately after handling or working with cement or cement-containing products/preparations, workers should wash thoroughly with neutral soap or mild detergent or use moisturising cream.

### 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 impervious, abrasion and alkali-resistant gloves, certified according to EN 374-parts 1,2,3, and safety shoes and/or boots and work clothing (long-sleeved and long-legged), as well as skin care products (including moisturising creams) to ensure maximum skin protection against prolonged contact with wet cement.

### Respiratory protection



When a worker may potentially be exposed to dust levels above exposure limits, use appropriate respiratory protection, proportionate to the level of dust and compliant with the relevant technical standards (such as filtering facepieces certified according to EN 149).

The personal protective equipment, based on the localised controls and [evaluated for a DNEL value = 1 mg/m<sup>3</sup>](#), are specified in the table below.

**Table 8.2.2**

Exposure scenario	PROC (*)	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency – Assigned Protection Factor (APF)
Industrial production / 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) P2 Mask (FF, FM) or B) P1 Mask (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		P2 Mask (FF, FM)	APF = 10
Industrial uses of dry hydraulic building and construction materials (indoor and outdoor)	2		Not required	--
	14, 22, 26		A) P2 Mask (FF, FM) or B) P1 Mask (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		P2 Mask (FF, FM)	APF = 10
Industrial uses of wet suspensions of hydraulic building and construction materials	7		A) P3 Mask (FF, FM) or B) P2 Mask (FF, FM)	APF = 20 APF = 10
	2, 5, 8b, 9, 10, 13, 14		Not required	--
Professional uses of dry hydraulic building and construction materials (indoor and outdoor)	2		A) P2 Mask (FF, FM) or B) P1 Mask (FF, FM)	APF = 10 APF = 4
	9, 26		A) P3 Mask (FF, FM) or B) P2 Mask (FF, FM)	APF = 20 APF = 10
	5, 8a, 8b, 14		P3 Mask (FF, FM)	APF = 20
	19 (#)		P3 Mask (FF, FM)	APF = 20



Professional uses of wet suspensions of hydraulic building and construction materials	11		A) P3 Mask (FF, FM) or B) P2 Mask (FF, FM)	APF = 20 APF = 10
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		Not required	--

(\*) The PROCs are identified uses, as defined in Section 1.2.

An example of the assigned protection factors (APF) for various respiratory protective equipment (RPE), according to EN 529:2005, can be found in the glossary of the MEASE approach [\[see Reference \(17\)\]](#).

### **Thermal hazards**

Not applicable.

### **8.2.3 Environmental exposure controls**

In the installations where cement is handled, transported, loaded, unloaded and stored, suitable measures must be adopted for the containment of the dispersion of cement dust into the work environments (see also Subsections 8.2.1 and 15.1).

In particular, preventive measures must ensure the containment of the respirable particulate concentration within the threshold limit value for the time-weighted average (TLV-TWA), adopted by the American Conference of Governmental Industrial Hygienists (ACGIH) for Portland cement.

Similarly, all the appropriate engineering-organisational steps must be taken in order to prevent the dispersion or accidental release of cement dust during the various production and use phases, mainly to prevent dumping onto the soil or into watercourses or the sewage and drainage systems.

The aquatic effect and risk assessment cover the effect on organisms / ecosystems due to possible pH changes related to hydroxides discharges. The eco-toxicity of the other dissolved inorganic components (ions) is negligible compared to the negative pH effect.

Any effects that might occur during production and use of the cement would be expected to take place on a local scale at the industrial installation. The pH of the effluent and surface water should not exceed 9.

Otherwise it could have an impact on municipal sewage treatment plants (STPs) and industrial waste water treatment plants (WWTPs).

For assessment of the exposure, a stepwise approach is recommended:

- Tier 1: Retrieve information on effluent pH and the contribution of the cement dust on the resulting pH. Should the pH be above 9 and be predominantly attributable to cement dust, then further actions are required to demonstrate safe use.
- Tier 2: Retrieve information on receiving water pH after the discharge point. The pH of the receiving water must not exceed the value of 9.
- Tier 3: Sample and measure the pH in the receiving water after the discharge point. If the pH is below 9, safe use is reasonably demonstrated. If the pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thereby ensuring safe use of cement during production and/or use phases.

No special preventive measures are necessary for the exposure to the terrestrial environment, except for correct application of ordinary, effective managerial practices.

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- (a) Appearance: dry cement is a finely ground solid inorganic material (main particle size: 5-30  $\mu\text{m}$ )
- (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, the melting point is > 1,250°C.
- (g) Flash point: not applicable, as it is not a liquid.
- (h) Evaporation rate: not applicable, as it is not a liquid.
- (i) Flammability (solid, gas): not applicable, as it 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 it is not a flammable gas.
- (k) Vapour pressure: not applicable, as the melting point is > 1,250 °C.
- (l) Vapour density: not applicable, as the melting point is > 1,250 °C.
- (m) Relative density: 2.7 ÷ 3.2 g/cm<sup>3</sup>  
Apparent density: 0.9 ÷ 1.5 g/cm<sup>3</sup>
- (n) Solubility in water (T = 20 °C): slight (0.1 ÷ 1.5 g/l)
- (o) Partition coefficient; n-octanol / water: not applicable, as it is an inorganic substance.
- (p) Auto-ignition temperature: not applicable (no pyrophoricity – no organo-metallic, organo-metalloid or organo-phosphine bindings or their derivatives, and no other pyrophoric constituent in the composition).
- (q) Decomposition temperature: not applicable, as there is no organic peroxide present.
- (r) Viscosity: not applicable, as it is not a liquid.
- (s) Explosive properties: not applicable; it is not explosive or pyrotechnic.  
It is not in itself capable of producing gas by chemical reaction at temperatures, pressures and speeds such as to cause damage to surroundings.  
It is not capable of a self-sustaining exothermic chemical reaction.
- (t) Oxidising properties: not applicable, as it does not cause or contribute to the combustion of other materials.

### 9.2 Other information

Not applicable.

## Section 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

When mixed with water, cement will harden into a stable mass that is not reactive in normal environments. Dry cement is chemically stable and compatible with most other building materials.

### 10.2 Chemical stability

Dry cement is stable as long as it is properly stored (see Section 7). It must be kept dry, and contact with incompatible materials should be avoided.

The integrity of the package and observance of proper storage procedures, specified under Subsection 7.2, are essential conditions in order to preserve the effectiveness of the reducing agent for the period of time specified on the bag or on the transport document.

Wet cement is alkaline and incompatible with acids, ammonium salts, aluminium and other non-noble metals. Cement dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas.

Cement also reacts with water to form silicates and calcium hydroxide. Silicates in cement react with powerful oxidisers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride and oxygen difluoride.

### 10.3 Possibility of hazardous reactions

Not applicable, as cement does not cause hazardous reactions.

### 10.4 Conditions to be avoided

Humid conditions during storage may cause loss of product quality and the formation of lumps (or blocks), with consequent difficulty in handling.

### 10.5 Incompatible materials

Contact with acids, ammonium salts, aluminium or other non-noble metals may cause exothermic reactions (temperature increase). Furthermore, hydrogen is produced when aluminium powder comes into contact with wet cement.

### 10.6 Hazardous decomposition products

Cement 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, in vivo and in vitro on animals (rabbit, 24 hours contact, 2 g/kg body weight) – no lethality. Based on the available data, the classification criteria are not met.	(2)
Acute toxicity - inhalation	-	No acute toxicity by inhalation observed. Based on the 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 the 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 existing abrasions 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 pozzolana, 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 abovementioned mechanisms. No sensitising effect is expected if the cement contains a soluble Cr (VI) reducing agent, as long as the specified period of effectiveness of the reducing agent is not exceeded [Reference (3)].	(3), (4), (16)
Respiratory sensitisation	-	There is no indication of sensitisation of the respiratory system. Based on the available data, the classification criteria are not met.	(1)

Germ cell mutagenicity	-	No indication. Based on the available data, the classification criteria are not met.	(12), (13)
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 the available data, the classification criteria are not met.	(1)  (14)
Reproductive toxicity	-	Based on the 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 (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 the available data, the classification criteria are not met.	(15)
Aspiration risk	-	Not applicable, as cements are not used as an aerosol.	

N.B.: Apart from skin sensitisation, Portland cement clinker and common cements have the same toxicological and eco-toxicological properties.

**- Medical conditions aggravated by exposure**

Prolonged exposure to high concentrations of respirable cement dust may aggravate existing respiratory system diseases and/or medical conditions such as emphysema or asthma and/or existing skin and/or eye conditions.

## Section 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

Cement is not hazardous to the environment.

Eco-toxicological 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 in 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 Bio-accumulative 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

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

### 12.6 Other adverse effects

Not relevant.

## Section 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

Cements and cement mixtures which are being disposed of must be managed according to the provisions of Legislative Decree No. 152 of 3/04/2006 - Part 4 "Waste management regulations", as amended, and subsequent implementing decrees.

Cements and cement mixtures, classified as non-hazardous special waste, do not pose particular risks for disposal, taking care to avoid its dumping or release into sewage systems or surface waters.

The empty bags must also be managed in compliance with current legislation on non-hazardous waste.

## Section 14. TRANSPORT INFORMATION

Cement does not fall under any hazard class for the transport of dangerous goods and, therefore, is not covered by the relative international regulations: IMDG (sea), ADR (road), RID (rail), ICAO/IATA (air).

During transport, avoid wind dispersion by using closed containers.

### 14.1 UN number

Not relevant.

### 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 MARPOL 73/78 and the IMSBC Code

Application of the provisions of the IMSBC code for maritime transport of solid bulk cargoes (see Annex C), adopted by the International Maritime Organisation (IMO) with Resolution MSC 268(85):2008 as amended and implemented in Italy with Ministry of Transport Decree No. 1340 of 30/11/2010

## Section 15. REGULATORY INFORMATION

### 15.1 Safety, health and environmental regulations /legislation for the mixture

- **Regulation (EC) 18/12/2006 No. 1907**  
"Registration, Evaluation, Authorisation and Restriction of Chemicals" (REACH)
- **Regulation (EC) 9/10/2008 No. 987**  
"Amendment of Regulation (EC) No. 1907/2006, as regards the exclusions defined in Annexes IV and V"
- **Amendment of Regulation (EC) No. 987/2008 of the Commission – 8/10/2008**

*“Modification of Annexes IV and V of Regulation (EC) No. 1907/2006”*

- **Regulation (EC) 22/06/2009 No. 552**  
*“Amendment of Regulation (EC) No. 1907/2006 of the European Parliament and Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), regarding Annex XVII “Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations”.*
- **Regulation (EC) 16/12/2008 No. 1272**  
*“Classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and Regulation (EC) 1907/2006”*
- **Regulation (EU) 20/05/2010 No. 453**  
*“Amendment of Regulation (EC) No. 1907/2006, as regards Annex II Guide to the compilation of safety data sheets (SDS)”*
- **Regulation (EU) 8/05/2013 No. 487**  
*“Amendment for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures”*
- **Ministry of Health Decree 10/05/2004**  
*“Implementation of Directive 2003/53/EC containing the twenty-sixth amendment to Directive 76/769/EEC of 27/07/1976, regarding the restrictions for placing on the market and use of certain hazardous substances and preparations (nonylphenol, nonylphenol ethoxylates, **cement**)”*
- **Ministry of Health Decree 17/02/2005**  
*“Adoption of a test method regarding cements, in reference to Ministerial Decree 10/05/2004, which implemented the twenty-sixth amendment of Directive 76/769/EC”*
- The so-called “**Good practice guide**”, which contains advice on safe handling and use of **crystalline silica** and products containing it, can be found from: <http://www.nepsi.eu/good-practice-guide.aspx>.  
These plant and operating methods were implemented under the Social Dialogue “*Agreement on Workers’ Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it*” signed on 25/04/2006 by Employee and Employer European sectoral associations, among which cement companies.  
In particular, according to the specific cement mixture (referring to siliceous components and respirable crystalline silica content) and to the methods of use, it is suitable to apply preventive technical and organisational measures and periodic occupational exposure controls, taking into account that the threshold limit value for the time-weighted average (TLV-TWA), adopted for workplaces by the American Conference of Governmental Industrial Hygienists (ACGIH) for “crystalline silica” is equal to 0.025 mg/m<sup>3</sup> (respirable fraction).

**- Restrictions on the marketing and use of cement due to the content of chromium VI**

**Regulation (EC) No. 1907/2006** concerning the registration, evaluation, authorisation and restriction of chemicals (“REACH”), **under Section 47 of Annex XVII**, as amended by **Regulation (EC) No. 552/2009**, prohibits the marketing and use of cement and cement preparations (mixtures) if they have, once mixed with water, a soluble chromium VI content of more than 0.0002% (2 ppm) of the total dry weight of ready-to-use cement.

The compliance with this limit threshold is ensured by adding a reducing agent to the cement, the effectiveness of which is guaranteed for a predetermined time period and with constant observance of suitable storage methods (specified in Subsection 7.2 and Section 10.2).

This time expiration concerns exclusively the effectiveness of the reducing agent for chromium (VI) salts, without prejudice to the limits of use of the product imposed by the general rules of storage and use of the product itself.

**- Requirements of Regulation (EC) No. 1907/2006 “REACH”**

Cement is a mixture according to REACH and, as such, is not subject to the obligation for registration, which instead concerns substances.



Portland cement clinker (*classifiable as an inorganic substance UVCB*) is exempt from registration pursuant to Article 2.7 (b) and Annex V.10 of Regulation (EC) No. 1907/2006 "REACH"; the European ECHA Agency has also been regularly provided with the necessary information to create the classifications inventory and labels (C&L), in accordance with Article 40 of Regulation (EC) No. 1272/2008 "CLP" (*see Notification No. 02-2119682167-31-0000 dated 15/12/2010 and updated on 1/07/2013 with the presentation of Report No. QJ420702-40*).

Moreover, if some substances used in the manufacturing of cements should become subject to registration, and particularly if the new descriptors of use, exposure scenarios, classification, etc. entail repercussions on the previously effective risk assessment, this Safety Data Sheet will be suitably updated based on the information made available by the Registrant.

## 15.2 Chemical safety assessment

No chemical safety assessment has been carried out.

## Section 16. OTHER INFORMATION

### 16.1 Indication of changes

This Safety Data Sheet has undergone a comprehensive review to reflect the provisions introduced by Regulation (EC) No. 1272/2008 "CLP" on the classification, labelling and packaging of substances and mixtures, and by Annex II of Regulation (EU) No. 453/2013 (**see SDS**), **in force on 1 June 2015**.

### 16.2 Abbreviations and acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ADR /RID	European Agreements on the transport of Dangerous goods by Road/Railway
APF	Assigned protection factor
CAS	Chemical Abstracts Service
EC	European Community
CLP	Classification, labelling and packaging ( <a href="#">Regulation (EC) 1272/2008</a> )
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Commercial chemical Substances
ERC	Environmental release category
ES	Exposure Scenario
FFP	Filtering Facepiece against Particles
FMP	Filtering Mask against Particles with filter cartridge
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods
IMO	International Maritime Organisation
IMSBC	International Maritime Solid Bulk Cargoes
LC50	Median lethal dose
LD50	Lethal Dose
MEASE	Metal Estimation and Assessment of Substance Exposure
MS	Member State
NOEL	No Observed Effect Level
OELV	Occupational Exposure Limit Value
PBT	Persistent, bio-accumulative and toxic



PC	Product category
PNEC	Predicted no-effect concentration
PPE	Personal protective equipment
PROC	Process category
REACH	Registration, Evaluation and Authorisation of Chemicals ( <a href="#">Regulation (EC) 1907/2006</a> )
RPE	Respiratory protective equipment
SCOEL	Scientific Committee on Occupational Exposure Limit Values
SDS	Safety Data Sheet
e-SDS	Extended Safety Data Sheet
SE	Single exposure
STP	Sewage treatment plant
STOT	Specific Target Organ Toxicity
SU	Sector of use
TLV-TWA	Threshold Limit Value - Time-Weighted Average
UVCB	Substance of Unknown or Variable composition, Complex reaction products or Biological materials
VLE	Exposure limit value
vPvB	Very persistent, very Bio-accumulative
w/w	Weight by weight
WWTP	Waste water treatment plant

### 16.3 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*, 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (October 2002).
- (6) U.S. EPA, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (October 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., (September 2009); 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) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo (December 2011).
- (17) 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>

#### 16.4 Training advice

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

#### 16.5 Further information

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

The table below lists the classification and procedures used to derive the classification of the mixture under Regulation (EC) No. 1272/2008 "CLP".

Classification pursuant to Regulation (EC) No. 1272/2008		Classification Procedure
Skin irritation 2	H315	Based on test data
Skin sensitisation 1B	H317	Human experience
Eye damage 1	H318	Based on test data
STOT SE 3	H335	Human experience

This Safety Data Sheet, along with any subsequent revisions, is available in electronic form on the company website: [www.buzziunicem.it/prodotti/cemento](http://www.buzziunicem.it/prodotti/cemento)

- For more information, contact:

**BUZZI UNICEM S.p.A.**

**Centro Ricerche**

00012 Guidonia RM, Italy

tel. +39 0774 385450

fax +39 0774 343228

## 16.6 Disclaimer

The information on this Safety 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 package 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 applying appropriate operating procedures regarding the prevention of risks in his/her own activities, in compliance with current legislation.

## 16.7 Emergency telephone numbers – Poison Centres in Italy

	CAV - Hospital	City	Address - Postcode	Telephone *
1	Azienda Ospedaliero - Universitaria "Ospedali Riuniti"	Foggia	Viale Luigi Pinto, no. 1 - 71122	0881 732326
2	Azienda Ospedaliera "A. Cardarelli"	Naples	Via A. Cardarelli, no. 9 - 80131	081 7472870
3	Policlinico Universitario "Umberto I"	Rome	Viale del Policlinico, no. 155 - 00161	06 49978000
4	Policlinico Universitario "A. Gemelli"	Rome	Largo Agostino Gemelli, no. 8 - 00168	06 3054343
5	Azienda Ospedaliero - Universitaria "Careggi" - Tossicologia Medica	Florence	Largo Brambilla, no. 3 - 50134	055 7947819
6	Centro Nazionale di Informazione Tossicologica, IRCCS Fondazione S. Maugeri, Clinica del Lavoro	Pavia	Via Salvatore Maugeri, no. 10 - 27100	0382 24444
7	Ospedale "Niguarda Ca' Granda"	Milan	P.za Ospedale Maggiore no. 3 - 20162	02 66101029
8	Azienda Ospedaliera "Papa Giovanni XXII" – Tossicologia Clinica	Bergamo	Piazza OMS, no. 1 - 24127	800 883300
9	Ospedale Pediatrico "Bambino Gesù"	Rome	Piazza Sant'Onofrio, no. 4 - 00165	06 68593726

\* when calling from abroad: +39 xxx xxxxxx