

## Safety Data Sheet - SDS of common cements and mixtures containing cement

(slow and fast-setting cementitious binders and hydraulic binders for non-structural applications)

Edition n.10 of 10 October 2023

### 1. IDENTIFICATION OF THE MIXTURE AND THE COMPANY

#### 1.1 Product Identifier

Common cement (hereinafter referred to as cement) and mixtures containing cement (cement agglomerants and hydraulic binders) that comply with the specific technical standards.

Trade Name**	Standard Name	UFI Code
ULTRACEM 42.5 ULTRACEM 52.5	I 42.5 R I 52.5 R I 52.5 R – SR5	2200-U0CW-500E-QU85
PORTLAND FERRIC 42.5	I 42.5 N – SR0	
ULTRACEM	I 52.5 R I 52.5 R – SR5	SV00-00A9-200Y-9ETX
TECNOCEM 32,5 TECNOCEM 42,5 TECNOCEM 32,5 EXPERT* TECNOCEM 42,5 EXPERT*	II/A-LL 32.5 R II/A-LL 42.5 R II/B-LL 32.5 R II/B-LL 42.5 R	YK00-V0H9-000D-PVSN
FIBROCEM	II/B-LL 32.5 R (1)	M410-H0DG-000F-8FK4
TECNOCEM	II/B-M (LL) 32.5 R	Q910-H0S8-M00F-K4R8
DURACEM 32.5	II/B-M (P-LL) 32.5 R II/B-M (V-LL) 32.5 R II/C-M (P-LL) 32.5 R II/C-M (V-LL) 32.5 R	
TERMOCEM GREEN 32,5 TERMOCEM GREEN 42,5	III/A 32.5 R – LH III/A 32.5 N – LH III/A 42.5 N III/A 42.5 N - LH III/B 42.5 N III/B 42.5 N – SR/LH	1500-C029-F00X-D5UV
DURACEM 32.5	IV/B (P-V) 32.5 R – LH/SR	2H00-Y0JP-V000-M2GP
DURACEM 42.5	IV/A (V) 42.5 R IV/A (V) 42,5 R - SR	5D10-10FN-W00X-8GAA
DURACEM 32.5 DURACEM 42.5	IV/A (P) 32.5 R IV/A (P) 32,5 R - SR IV/A (P) 42.5 N IV/A (P) 42.5 R IV/A (P) 42,5 R - SR	N800-F0GG-X00H-N1RG
DURACEM 32.5	IV/B (P) 32.5 R – SR/LH IV/B (P) 32.5 R – SR IV/B (P) 32.5 N – SR IV/B (P) 32.5 N – SR/LH	SF10-J052-700E-WTWD

Slow-setting cementitious binders:

Trade Name**	Standard Name	UFI Code
MURACEM	MC 12.5	CQ10-F0GE-Y00U-9ADH
PAVI FORTE		KN10-J0HU-U00E-7H2H

Hydraulic binders for non-structural applications:

Trade Name**	Standard Name	UFI Code
PLASTOCEM*	HB 3.0	J300-F03Q-A00H-ACKC

(\*) mixtures in which Flue dust may be contained

(\*\*) the trade name may also include the suffix Italcementi

## 1.2 Relevant identified uses of the substance or mixture and uses not recommended

Cement is used as a hydraulic binder for the manufacture of concrete, mortars, plasters, etc. Cement and cement-containing mixtures are used industrially in the production of building materials and constructions by professional users and end consumers. The identified uses of cements and cement-containing mixtures cover dry products and wet suspension products (mix).

## Process Categories (PROCs) and Use Descriptors

PROC	Identified Uses – Description of Use	Production/ Formulation of	
		Building & Construction Materials	Professional/industrial use of
2	Use in a closed, continuous process, with occasional controlled exposure	X	X
3	Use in a closed batch process (synthesis or formulation)	X	X
5	Mixing or blending in batch processes for the formulation of preparations* and articles (multi-step contact and/or significant contact)	X	X
7	Industrial spray application		X
8a	Transfer of a substance or preparation* (filling/emptying) from/to containers/large containers, in non-dedicated facilities		X
8b	Transfer of a substance or preparation* (filling/emptying) from/to containers/large containers, in dedicated facilities	X	X
9	Transfer of a substance or preparation* into small containers (dedicated filling line, including weighing)	X	X
10	Application with rollers or brushes		X
11	Non-industrial spray application		X
13	Treatment of articles for immersion and casting		X
14	Production of preparations* or articles for tablet compression, compression, extrusion, pelletizing	X	X
19	Manual mixing with direct contact, with only the use of personal protective equipment (PPE)		X
22	Machining operation in the context of potentially closed mineral/metal processes at elevated temperatures. Industrial environment		X
26	Handling of solid inorganics at room temperature	X	X

\* In order to maintain consistency with the system of Descriptors indicated in EUCLID5.2, the term "prepared" has not been replaced by the new term "mixture" in the Table

## 1.3 Safety Data Sheet Supplier Information

**HEIDELBERG MATERIALS ITALIA CEMENTI SPA**

Innovation Campus Milan

Via Lombardia 2/A

20068 Peschiera Borromeo (MI)

[www.heidelbergmaterials.it](http://www.heidelbergmaterials.it)

## 1.4 Emergency telephone number

Hospital	City	Address - Zip Code	Telephone
University of Foggia Hospital	Foggia	V.le Luigi Pinto, 1 - 71122	800183459
"A. Cardarelli" Hospital	Naples	Via A. Cardarelli, 9 - 80131	081-5453333
CAV Policlinico "Umberto I"	Rome	V.le del Policlinico,155 - 00161	06-49978000
CAV Policlinico "A. Gemelli"	Rome	Largo Agostino Gemelli, 8 - 00168	06-3054343
Azienda Ospedaliera "Careggi" U.O. Medical Toxicology	Florence	Largo Brambilla, 3 - 50134	055-7947819

CAV National Centre for Toxicological Information	Pavia	Via Salvatore Maugeri, 10 - 27100	0382-24444
Niguarda Ca' Granda Hospital	Milan	Piazza Ospedale Maggiore,3 - 20162	02-66101029
Papa Giovanni XXII Hospital	Bergamo	Piazza OMS, 1 - 24127	800883300
CAV "Bambino Gesù Children's Hospital", Dip. Emergency and DEA Acceptance	Rome	Piazza Sant'Onofrio, 4 - 00165	06-68593726
Verona Integrated Hospital	Verona	Piazzale Aristide Stefani, 1 - 37126	800011858

Available outside office hours YES  NO

## 2. HAZARD IDENTIFICATION

### 2.1 Classification of the mixture according to Regulation (EU) 1272/2008 (CLP)

Hazard class	Hazard category	HAZARD STATEMENTS
Skin Irritation	2	H315: Causes skin irritation
Severe eye injury/eye irritation	1	H318: Causes serious eye injury
Skin sensitization	1 B	H317: May cause an allergic skin reaction
Specific Target Organ Toxicity (Single Exposure) Respiratory Tract Irritation	3	H335: May irritate the respiratory tract

### 2.2 Label Elements

Pursuant to Regulation 1272/2008 (CLP)

#### Hazard pictograms



#### Warnings

Danger

#### Hazard statements

H318: Causes serious eye injury

H315: Causes skin irritation

H317: May cause an allergic skin reaction

H335: May irritate the respiratory tract

#### Precautionary statements

P102 Keep out of reach of children.

P280: Wear Protective Gloves/Protective Clothing/Eye Protection/Face Shielding

P305+P351+P338+P310: IN CASE OF EYE CONTACT: Rinse thoroughly with water for several minutes. Remove any contact lenses if it is easy to do so. Continue rinsing. If you feel unwell, contact a POISON CENTER or doctor immediately.

P302+P352+P333+P313: IN CASE OF SKIN CONTACT: Wash thoroughly with soap and water. If skin irritation or rash

occurs, seek medical attention.

P261+P304+P340+P312: Avoid breathing dust. IN CASE OF INHALATION: transport the injured person to fresh air and keep him at rest in a position that favors breathing. If you feel unwell, contact a POISON CENTER or a doctor.

P101 If you consult a doctor, keep the container or label of the product available.

P501 Dispose of the contents/container in accordance with current regulations.

### Other information

Skin contact with fresh mortar may cause irritation, dermatitis or burns.

It can cause damage to products made of aluminum or other non-noble metals.

### 2.3 Other Hazards

Cement and cement-containing mixtures, in the presence of water, for example in the production of concrete or mortar, or when wet, produce a strongly alkaline solution (high pH due to the formation of calcium, sodium and potassium hydroxides). Cement and cement-containing mixtures can irritate the eyes, mucous membranes, throat and respiratory system and cause coughing. Repeated inhalation of cement dust and cement-containing mixtures over a long period of time increases the risk of lung disease.

Repeated and prolonged contact of cement on damp skin, due to perspiration or moisture, can cause irritation and/or dermatitis (Bibliography [4]). If ingested significantly, cement can cause ulceration of the digestive system. Both cement and cement-containing mixtures and their mixtures, in case of prolonged contact with the skin, can cause sensitization (due to the presence of traces of chromium VI salts); where necessary, this effect shall be depressed by the addition of a specific reducing agent to maintain the water-soluble chromium VI content at concentrations below 0,0002 % (2 ppm) on the total dry weight of the same cement, in accordance with the legislation referred to in point 15.

Cement and cement-containing mixtures do not meet the criteria of PBTs or vPvBs under Annex XIII of REACH (Regulation 1907/2006/EC).

Cement may contain respirable crystalline free silica.

## 3. COMPOSITION/INGREDIENT INFORMATION

### 3.1 Substances

Not applicable

### 3.2 Mixtures

Common cement types are produced in accordance with EN 197-1.

#### 3.2.1 Components presenting a health hazard

Constituent	% by weight	EC Number	CAS	Classification according to Regulation 1272/2008/EC		
				Hazard class	Hazard category	Hazard statements
Portland cement clinker	20-95	266-043-4	65997-15-1	STOT SE: Specific Target Organ Toxicity (Single Exposure) Respiratory Tract Irritation	3	H335: May irritate the respiratory tract
				Irritation	2	H315: Causes skin irritation
				Severe eye injury/eye irritation	1	H318: Causes serious eye injury
				Skin sensitization	1B	H317: May cause an allergic skin reaction
Flue dust	0-5	270-659-9	68475-76-3	STOT SE: Specific Target Organ Toxicity (Single Exposure) Respiratory Tract Irritation	3	H335: May irritate the respiratory tract
				Irritation	2	H315: Causes skin irritation
				Severe eye injury/eye irritation	1	H318: Causes serious eye injury
				Skin sensitization	1B	H317: May cause an allergic skin reaction

#### Note:

- Clinker: C&L notification n°02-2119682167-31-0000 (Notification update of 01/07/2013 – Report presentation no. QJ420702-40).

- Flue dust: REACH registration n°01-2119486767-17-0xxx

Cements and cement-containing mixtures are finely ground mixtures consisting of clinker, gypsum (or other forms of calcium sulphate) and other specific constituents (limestone, pozzolan, etc.).

Flue dust, if present in the cement formulation, is dosed as a secondary constituent.

For some types of cements and cement-containing mixtures, other components may be used as secondary constituents, grinding additives and any reducing agents, which have toxicological characteristics and risk levels equal to or lower than those of clinker.

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

#### **General notes**

No personal protective equipment is required for rescuers, who must avoid inhaling cement dust and contact with damp cement or preparations containing wet cement. If this is not possible, they must use the personal protective equipment described in Section 8.

#### **In case of inhalation**

Get the person out in the fresh air. The dust in the throat and nostrils should clean itself spontaneously. Contact a doctor if irritation persists, or if it occurs later or if you have discomfort, cough, or other symptoms persist.

#### **In case of skin contact**

For dry concrete, remove and rinse thoroughly with water. For wet/damp concrete, wash the skin with plenty of water and pH-neutral soap or proper light detergent. Remove contaminated clothing, shoes, glasses and clean them completely before using them again. Consult a physician in all cases of irritation or burn.

#### **In case of contact with eyes**

Do not rub your eyes to avoid possible corneal damage caused by rubbing.

If present, remove the contact lenses. Tilt your head in the direction of the affected eye, open your eyelids wide and rinse with plenty of water for at least 20 minutes to remove all residue. If possible, use isotonic water (0.9% NaCl). If necessary, contact an occupational health specialist or ophthalmologist.

#### **In case of ingestion**

Do not induce vomiting. If the person is conscious, wash the mouth with water and make them drink plenty of water. Seek immediate medical attention or contact a Poison Control Center.

### 4.2 Main symptoms and effects, both acute and delayed

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

**Skin:** Cement and its preparations may have an irritating effect on damp skin (due to sweating or moisture) after prolonged contact or may cause contact dermatitis, after repeated contact.

*For further details, see Bibliography (1).*

**Inhalation:** Repeated inhalation of cement dust or cement-containing mixtures over a long period of time increases the risk of lung disease.

**Ingestion:** In case of accidental ingestion, cement can cause ulcers in the digestive system.

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

### 4.3 Indication of whether you need to seek immediate medical attention and special treatment

See section 4.1. When contacting a doctor, take the SDS with you.

## 5. FIRE-FIGHTING MEASURES

### 5.1 Extinguishing media

Cement and its preparations are non-flammable, in the event of a fire in the surrounding area, all means of fire extinguishing can be used.

### 5.2 Special Hazards Arising from the Mixture

Cement and its preparations are non-combustible or explosive and do not facilitate or fuel the combustion of other materials.

### 5.3 Recommendations for Fire Extinguishers

Cement and its preparations do not present fire-related risks. No special protective equipment is required for firefighters.

## 6. MEASURES IN CASE OF ACCIDENTAL RELEASE

### 6.1 Personal Precautions, Protective Equipment, and Emergency Procedures

#### 6.1.1 For those who do not intervene directly

Wear protective gear as described in Section 8 and follow the safe use and handling recommendations of Section 7.

#### 6.1.2 For those who intervene directly

No specific emergency procedures are required.

In any case, it is necessary to use personal protective equipment (PPE) for the protection of the eyes, skin and respiratory tract, in situations with high levels of dustiness.

### 6.2 Environmental Precautions

Avoid discharge or dispersion of cement into drainage and sewer systems or into water bodies (e.g., surface waterways).

### 6.3 Methods and materials for containment and remediation

#### Dry cement

Use dry cleaning methods such as vacuum cleaners or vacuum extractors (portable industrial units, equipped with high-efficiency particulate filters or equivalent techniques), which do not disperse dust into the environment.

Never use compressed air.

Ensure workers wear appropriate personal protective equipment and prevent cement dust from spilling (see section 8).

Avoid inhalation of cement dust and contact with skin and eyes. Store spilled material in containers for future use.

#### Wet concrete

Remove the wet cement and place it in a container. Allow the material to dry and set before disposing of it as described in Section 13.

### 6.4 Reference to other sections

See Sections 8 and 13 for more details.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

### 7.1.1 Protective measures

Follow the recommendations provided in Section 8. To remove dry concrete, see step 6.3.

#### *Fire Prevention Measures*

Not applicable

#### *Measures to prevent the generation of aerosols and dust*

Do not sweep or use compressed air. Use dry cleaning methods (e.g. vacuum cleaners and extractors) that do not cause airborne leakage.

For more information, please refer to the guidelines adopted under the Agreement on the Protection of Workers' Health through the Proper Management and Use of Crystalline Silica and Products containing it, by European workers' and employers' industry associations. Safe handling practices can be downloaded at the following link: <https://guide.nepsi.eu>.

#### *Environmental protection measures*

When handling the material, avoid its dispersion in the environment.

### 7.1.2 General workplace hygiene information

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

## 7.2 Conditions for safe storage, including possible incompatibilities

Cement should be stored in conditions that are impermeable, dry (e.g. with minimal internal condensation), clean and protected from contamination.

Risk of burial: Cement can thicken or stick to the walls of the confined space where it is stored. Concrete can collapse, collapse or fall unexpectedly.

To prevent burial or suffocation, do not enter confined spaces, such as silos, containers, bulk trucks, or other storage containers or vessels that store or contain cement without taking appropriate safety measures.

Do not use aluminum containers for the storage or transport of mixtures containing wet cement due to material incompatibility.

## 7.3 Special end-uses

No further information (see Section 1.2).

## 7.4 Soluble Chromium VI Control

The integrity of the packaging and compliance with the storage methods mentioned above are essential conditions to ensure the maintenance of the effectiveness of the reducing agent for the period of time reported on the DDT (both for bagged and bulk products) and also on each individual bag.

This deadline concerns only the effectiveness of the reducing agent in maintaining the level of water-soluble chromium VI, determined according to the EN 196-10 standard, below the limit of 0.0002% of the total dry weight of ready-to-use cement, imposed by current legislation (see page 15), without prejudice to the limits of use of the mixture dictated by the general rules of storage and use of the product itself.

## 8. EXPOSURE/PERSONAL PROTECTION CONTROLS

### 8.1 Control Parameters

The time-weighted threshold limit value (TLV-TWA) adopted in workplaces for Portland cement by the American Industrial Hygienists Association (ACGIH) is 1 mg/m<sup>3</sup> (respirable fraction). For the indication of the exposure level we have:

DNEL (respirable fraction): 1 mg/m<sup>3</sup>

DNEL (leather): not applicable

DNEL (ingestion): Not relevant

As far as the environmental risk assessment is concerned, there are:

PNEC (water): Not applicable

PNEC (sediment): Not applicable

PNEC (land): not applicable

In relation to the possible presence of free crystalline silica in the respirable fraction, for the professional user to comply with the occupational exposure limits to respirable crystalline silica within 8 working hours (OEL (EU) = 0.1 mg/m<sup>3</sup> (respirable fraction, 8h) VLEP (IT) = 0.1 mg/m<sup>3</sup> (respirable fraction, 8h) - Annex XLIII Legislative Decree 81/2008).

The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a threshold value of 0.025 mg/m<sup>3</sup>.

## 8.2 Exposure Controls

For each individual Process Category (PROC), the user can choose between options A) and B) in Table 8.2.1 below, depending on which is best suited to their specific situation. If an option is chosen, it must be selected in Table 8.2.2 of Section 8.2.2 "Personal protective measures, such as personal protective equipment – Specifications for respiratory protective equipment". Therefore, only combinations of A) – A) and B) – B are possible.

### 8.2.1 Suitable technical controls

In plants where cement is handled, transported, loaded, unloaded and stored, measures must be taken to protect workers and to contain dust emissions into the workplace as indicated in the table (DNEL = 1 mg/m<sup>3</sup>). The localised controls will be defined in relation to the existing situations and consequently the corresponding specific respiratory protection equipment will be identified, as indicated in the table in point 8.2.2.

Utilization	PROC*	Exhibition	Localized Controls	Efficiency
Industrial Manufacturing/Hydraulic Materials Formulation for Building and Construction	2, 3	Unlimited duration (up to 480 minutes per shift, 5 shifts per week); (#) < 240 minutes	Unsolicited	-
	14, 26		A) Not required or B) General local exhaust ventilation	-
			General Exhaust Local Ventilation	78 %
5, 8b, 9	General Exhaust Local Ventilation		78 %	
Industrial Uses of Building and Construction Plumbing Materials (Indoor, Outdoor)	2		Unsolicited	-
	14, 22, 26		A) Not required or B) General local exhaust ventilation	-
			General local exhaust ventilation	78 %
5, 8b, 9	General local exhaust ventilation		78 %	
Industrial Uses of Wet Suspensions or Building and Construction Hydraulic Materials	7		A) Not required or B) General local ventilation	-
	2, 5, 8b, 9, 10, 13, 14		Unsolicited	-
Professional use of plumbing materials for building and dry construction (indoor, outdoor)	2		A) Not required or B) General local exhaust ventilation	-
	9, 26		A) Not required or B) General local exhaust ventilation	72 %
	5, 8a, 8b, 14	General Exhaust Local Ventilation	72 %	
	19 (#)	Localized controls are not applicable, the process only in well-ventilated rooms or outdoors	-	
Professional Uses of Wet Suspensions or Hydraulic Materials for Building and Construction	11	A) Not required or B) General local exhaust ventilation	-	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	Unsolicited	72 %	



\*PROC are the uses identified as defined in Section 1.2.

### 8.2.2 Personal protective measures such as personal protective equipment

**General:** In plants where cement is handled, transported, loaded and unloaded, and stored, appropriate measures must be taken to protect workers and to contain emissions into the workplace. Do not eat, drink, or smoke while working with the mixture to avoid contact with your skin or mouth. Immediately after handling/handling cement or products/preparations containing it, it is necessary to wash with mild soap or appropriate light detergent or use moisturizers.

Discard contaminated clothes, footwear, glasses, etc. and clean them completely before using them again.

#### **Eye/face protection**



Wear approved goggles or safety masks according to EN 166 when handling dry or damp concrete to prevent contact with eyes.

#### **Skin protection**



Use gloves with mechanical resistance to abrasion according to EN ISO 388 with nitrile coating or alternatively neoprene coating, preferably 3/4 or totally in the case of heavier activities. In the event of possible contact with damp matter, use a glove with specific chemical protection according to EN ISO 374 with a specific thickness and degree of permeation (in particular to alkalis) depending on the type of use (immersion or possible accidental contact). Always change damaged or soaked gloves immediately. In some circumstances, such as for laying concrete or screed, waterproof pants or knee pads are required.

#### **Respiratory protection**



When a person is potentially exposed to dust levels above the exposure limits, use appropriate respiratory protection commensurate with the level of dustiness and complying with the relevant EN standards (e.g. filtering facepiece certified according to EN 149).

Personal protective equipment, defined according to localized controls and evaluated for a DNEL value = 1 mg/m<sup>3</sup>, is shown in the Table.

Utilization	PROC*	Exhibition	Specific Respiratory Protection Equipment (RPE)	RPE Efficiency – Assigned Protection Factor (APF)
Industrial Manufacturing/Hydraulic Materials Formulation for Building and Construction	2, 3	Duration not limited (up to 480 minutes per shift, 5 shifts per week); (#) < 240 minutes	Unsolicited	-
	14, 26		A) P2 mask (FF) or B) P1 mask (FF)	APF = 10 APF = 4
	5, 8b, 9		Mask P2 (FF)	APF = 10
Industrial Uses of Building and Dry Construction Plumbing Materials (Indoor, Outdoor)	2		Unsolicited	-
	14, 22, 26		A) P2 mask (FF) or B) P1 mask (FF)	APF = 10 APF = 4
	5, 8b, 9		Mask P2 (FF)	APF = 10
Industrial Uses Wet Suspensions or Hydraulic Materials for Building and Construction	7		A) P3 mask (FF) or B) P2 mask (FF)	APF = 20 APF = 10
	2, 5, 8b, 9, 10, 13, 14		Unsolicited	-
Professional use of plumbing materials for building and dry construction (indoor, outdoor)	2		A) P2 mask (FF) or B) P1(FF) mask	APF = 10 APF = 4
	9, 26		A) P3 mask (FF) or B) P2 mask (FF)	APF = 20 APF = 10
	5, 8a, 8b, 14		Mask P3 (FF)	APF = 20
	19 (#)		Mask P3 (FF)	APF = 20
Professional Uses of Wet Suspensions or Hydraulic Materials for Building and Construction	11		A) P3 mask (FF) or B) P2 mask (FF)	APF = 20 APF = 10
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		Unsolicited	-

\*PROC are the uses identified as defined in Section 1.2.

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

### **Thermal Hazards**

Not applicable

### **8.2.3 Environmental Exposure Controls**

See roadworthiness control measures to prevent the dispersion of cement dust into the environment.

Take steps to ensure that cement does not reach the water (sewer systems or groundwater or surface water).

In plants where cement is handled, transported, loaded and unloaded, and stored, suitable measures must be taken to contain dust emissions into the workplace. In particular, preventive measures must ensure that the concentration of respirable particulate matter is contained within the time-weighted threshold limit value (TLV-TWA) adopted by the American Industrial Hygienists Association (ACGIH) for Portland cement.

The control of environmental exposure for the emission of cement particles into the air must be carried out according to the available technology and the regulations regarding dust particle emissions in general.

Environmental exposure control is relevant for the aquatic environment such as cement emissions at different stages of the life cycle (production and use) applied mainly to soil and wastewater. The aquatic effect and risk assessment cover the effect on organisms/ecosystems due to possible pH changes related to the release of hydroxides. It is believed that the toxicity of the other dissolved inorganic ions may be negligible compared to the potential effect of pH.

Any other effects that may occur during production and use are to be considered to take place on a local scale. The pH of the drain and surface water should not exceed 9. Otherwise, it could have an impact on municipal wastewater

treatment plants (STPs) and industrial wastewater treatment plants (WWTPs). A step-by-step approach is recommended for such exposure assessment.

Level 1: Retrieve information on the pH of the exhaust and the contribution of cement to the resulting pH. If the pH is higher than 9 and predominantly attributable to cement, then further action would be required to demonstrate safe use.

Level 2: Retrieve information about the pH of the collected water after the discharge point. The pH value should not exceed 9.

Level 3: Measure the pH in the collected water after the discharge point. If the pH is below 9, safe use is reasonably demonstrated. If the pH is higher than 9, risk management measures must be implemented: the discharge must be neutralized, so that the cement can be used safely during production or use.

No special emission control measures are required for exposure to the terrestrial environment.

See Section 6 for more details.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on Fundamental Physical and Chemical Properties

- a) Physical state: cement is an inorganic solid material in powder form
- b) Color: grey or white powder (dry cement)
- c) Smell: odourless
- d) Melting point / freezing point: > 1250° C/n.p.
- e) Boiling point or initial boiling point and boiling range: Not applicable as, under normal atmospheric conditions, the melting point > 1250° C
- f) Flammability (solid, gas): Not applicable as it is a solid that is non-combustible and does not cause or contribute to the ignition of fires by rubbing
- g) Upper/Lower Explosive Limits: Not applicable as it is not a flammable gas
- h) Flash Point: Not applicable as it is not a liquid
- i) Auto-ignition temperature: not applicable (no pyrophoricity - no organo-metallic bonds, metalloid organs or organo-phosphine or their derivatives, and no other pyrophoric constituents in the composition)
- j) Decomposition temperature: not applicable, as no organic peroxide is present
- k) pH: (T = 20°C in water, water-to-solid ratio 1:2): 11-13.5
- l) Kinematic viscosity: not applicable, as it is not liquid
- m) Solubility in water (T = 20° C): light (0.1-1.5 g/l)
- n) Partition coefficient: n-octanol/water: not applicable as it is an inorganic mixture
- o) Vapour pressure: not applicable as the melting point > 1250° C
- p) Density and/or relative density: 2.75-3.20 g/cm<sup>3</sup>; Bulk density: 0.9-1.5 g/cm<sup>3</sup>
- q) Relative vapour density: Not applicable as the melting point > 1250° C
- r) Particle characteristics: main particle size: 5-30 µm

### 9.2 Other information

Not applicable.

#### 9.2.1 Information Regarding Physical Hazard Classification

Not applicable

#### 9.2.2 Other Safety Features

Not applicable

## 10. STABILITY AND RESPONSIVENESS

### 10.1 Reactivity

When mixed with water, cement hardens to form a stable mass that does not react with the environment.

### 10.2 Chemical stability

Cement as it is stable for longer the more properly it is stored (see Section 7). It must be kept dry. Contact with incompatible materials must be avoided.

Wet cement is alkaline and incompatible with acids, ammonium salts, aluminium and other non-noble metals. Cement in contact with hydrofluoric acid decomposes to produce corrosive silicon tetrafluoride gas. Cement reacts with water and forms silicates and calcium hydroxide. The silicates in cement react with powerful oxidants such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen bifluoride.

The integrity of the packaging and compliance with the storage methods mentioned in point 7.2 (special closed containers, a cool and dry place and absence of ventilation) are essential conditions for maintaining the effectiveness of the reducing agent during the storage period specified on the bag or on the DDT.

### 10.3 Possibility of dangerous reactions

Cement does not cause dangerous reactions.

### 10.4 Conditions to avoid

Humid conditions during storage can cause lumps 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 concrete should be avoided as hydrogen develops.

### 10.6 Hazardous decomposition products

Cement does not decompose into any hazardous product.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on hazard classes defined in Regulation (EC) No 1272/2008

Hazard class	Cat	Effect	Bibliography
Acute-dermal toxicity	-	Limit test on rabbit, 24-hour contact, 2,000 mg/kg body weight – non-lethal. Based on available data, it does not fall under the classification criteria	(2)
Acute toxicity - inhalation	-	No acute inhalation toxicity observed. Based on available data, it does not fall under the classification criteria	(9)
Acute Toxicity - Oral	-	No indication of oral toxicity from studies with cement kiln dust. Based on available data, it does not fall under the classification criteria	From the bibliographic
Skin corrosion/skin irritation	2	Cement in contact with damp skin can cause thickening, cracking, and splitting of the skin. Prolonged contact in combination with existing abrasions can cause severe burns. Some individuals may develop eczema as a result of exposure to moist cement dust, caused by the high pH that can induce irritant contact dermatitis after prolonged contact.	(2) Human Experiences
Severe eye damage/eye irritation	1	Clinker caused a mix of heterogeneous effects on the cornea and the calculated irritation index was 128. Direct contact with cement can cause corneal injury due to mechanical stress, irritation, or immediate or delayed inflammation. Direct contact with large amounts of dry cement or with damp cement projections can cause effects ranging from moderate eye irritation (e.g., conjunctivitis or blepharitis) to chemical burns and blindness.	(10), (11)
Skin sensitization	1B	Some individuals may develop eczema as a result of exposure to wet cement dust, which is caused by an immunological reaction to soluble Cr(VI) that results in allergic contact dermatitis. The response can appear in a variety of forms that can range from a mild rash to severe dermatitis. No sensitization effect is expected if the cement contains a water-soluble Cr(VI) reducing agent until the indicated period of efficacy of that reducing agent has passed (reference (3)).	(3), (4), (17)
Respiratory sensitization	-	There are no indications of sensitization of the respiratory system. Based on available data, it does not fall under the ranking criteria.	(1)

Germ cell mutagenicity (germ)	-	No indication. Based on available data, it does not fall under the ranking criteria.	(12), (13)
Carcinogenicity	-	No causal association has been established between exposure to Portland cement and cancer. The epidemiological literature does not support the identification 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 about the possibility of being carcinogenic to humans but cannot be definitively assessed due to lack of data. In vitro or animal studies do not provide indications of carcinogenicity that would be sufficient to classify the agent under any of the other notations). Based on available data, it does not fall under the ranking criteria.	(1) (14)
Reproductive toxicity	-	Based on available data, it does not fall under the ranking criteria.	No evidence from human experience
STOT – single exposure	3	Cement dust can irritate the throat and respiratory system. Coughing, sneezing and wheezing may occur as a result of exposures above occupational exposure limits. Overall, the evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, the evidence currently available is insufficient to establish with certainty the dose-response relationship for these effects.	(1)
STOT – repeated exposure	-	Long-term exposure to respirable cement dust above the occupational exposure limit can lead to coughing, shortness of breath and chronic obstructive changes in the respiratory tract. No chronic effects were observed at low concentrations. On the basis of the available data, the classification criteria are not met	(15)
Danger in case of suction	-	Not applicable as cement is not used as an aerosol.	

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

#### **Clinical conditions aggravated by exposure**

Inhalation of cement can aggravate existing diseases of the respiratory system and/or clinical conditions such as emphysema or asthma and/or existing skin and eye conditions.

### **11.2 Information on Other Hazards**

#### **Section 11.2.1 Endocrine disrupting properties**

Not applicable

#### **11.2.2 Other information**

Not applicable

## **12. ECOLOGICAL INFORMATION**

### **12.1 Toxicity**

Cement is not dangerous to the environment. Ecotoxicity tests with Portland cement on *Daphnia magna* [Bibliography (5)] and *Selenastrum coli* [Bibliography (6)] demonstrated a small toxicological impact. Therefore the LC50 and EC50 values cannot be determined [Bibliography (7)]. There are no indications of toxicity in the sedimentary phase [Bibliography (8)]. Adding large amounts of cement to the water can, however, cause an increase in pH and can, 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 poses no risk of toxicity.

### **12.3 Bioaccumulation potential**

Not relevant, as cement is an inorganic material. After hardening, cement poses no risk of toxicity.

#### 12.4 Mobility in the soil

Not relevant, as cement is an inorganic material. After hardening, cement poses no risk of toxicity.

#### 12.5 PBT and vPvB Assessment Results

Not relevant, as cement is an inorganic material. After hardening, cement poses no risk of toxicity.

#### 12.6 Endocrine disrupting properties

Not relevant

#### 12.7 Other Adverse Effects

Not relevant

### 13. DISPOSAL CONSIDERATIONS

Cement and any packaging intended for disposal must be managed in accordance with the provisions of Part IV "Waste Management Regulations" of Legislative Decree 152/2006 "Environmental Regulations" and subsequent amendments and related implementing decrees.

#### 13.1 Waste Treatment Methods

Do not dispose of in sewer systems or surface water.

##### Product - Cement that is past its expiry date

When it is demonstrated that it contains more than 0.0002% soluble chromium VI: it must not be used/sold except for use in closed, controlled and fully automated processes or must be recycled or managed in accordance with Legislative Decree 152/2006 and subsequent amendments or treated again with a reducing agent).

##### Product – unused residue or dry spill

Collect unused dry residue or dry spills as is. If necessary, reuse based on shelf-life considerations and the obligation to avoid exposure to dust. In case of disposal, manage in accordance with Legislative Decree 152/2006 and subsequent amendments.

##### Product – sludge

Allow to harden, avoid entering sewer and drainage systems or water bodies (e.g. waterways) and dispose of as explained below under "Product - after adding water, hardened".

##### Product - after adding water, hardened

Dispose of according to Legislative Decree 152/2006 and subsequent amendments. Avoid entering the sewer water system.

##### Packaging

Empty the packaging and handle it in accordance with current regulations. The assignment of the EER code must be carried out in accordance with the Guidelines adopted pursuant to art. 184, paragraph 4 of Legislative Decree 152/2006 and subsequent amendments.

### 14. TRANSPORTATION INFORMATION

Cement is not regulated by international regulations for the transport of dangerous goods: IMDG (by sea), ADR (by road), RID (by rail), IATA (by air), and therefore no classification is required.

No special precautions are required other than those mentioned in Section 8. During transport, avoid wind leakage, using closed containers.

#### 14.1 UN number or ID number

Not relevant.

#### **14.2 Official UN Transport Designation**

Not relevant.

#### **14.3 Transport-related hazard classes**

Not relevant.

#### **14.4 Packaging group**

Not relevant.

#### **14.5 Hazards to the environment**

Not relevant.

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

Not relevant.

#### **14.7 Maritime bulk transport in accordance with IMO acts**

Not relevant.

### **15. REGULATORY INFORMATION**

#### **15.1 Mixture-specific health, safety and environmental laws and regulations**

- Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Use of Chemicals (REACH) as amended
- Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and Regulation 1907/2006/EC (CLP) and subsequent amendments and additions.
- Legislative Decree no. 81 of 9/04/2008 and subsequent amendments and additions "Implementation of Article 1 of Law No. 123 of 3 August 2007 on the protection of health and safety in the workplace".
- EN 196/10 - "Test methods for cement – Part 10: Determination of the water-soluble chromium VI content of cement
- EN 197/1 – "Cement – Composition, specifications and conformity criteria for common cements"
- EN 15368 Hydraulic Binder for Non-Structural Applications - Definition, Specifications and Compliance Criteria
- EN 413-1 Masonry cement - Part 1: Composition, specifications and conformity criteria
- EN 14216 Cement - Composition, Specifications and Conformity Criteria for Specialty Hydrohydration Heat Cements
- Legislative Decree 152/2006 "Environmental Regulations" and subsequent amendments
- Regulation 2020/1677/EU amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures in order to improve the practicability of health emergency response information requirements
- Legislative Decree no. 44 of 1 June 2020 "Implementation of Directive (EU) 2017/2398 of the European Parliament and of the Council of 12 December 2017 amending Council Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
- Decree no. 47 of 9 August 2021 approving the "Guidelines on the classification of waste" referred to in the resolution of the Council of the National System for the Protection of the Environment of 18 May 2021, no. 105, as provided for by art. 184, paragraph 5 of Legislative Decree no. No. 152 of 2006, as amended by Legislative Decree no. No. 116 of 2020.

Regulation (EC) No. 1907/2006 (REACH), in Annex XVII, point 47, as amended by Regulation No. 552/2009, imposes a ban on the marketing and use of cement and cement preparations if they contain, when mixed with water, more than

0.0002% (2 ppm) of water-soluble chromium VI on the total dry weight of the cement itself. Compliance with this limit threshold is ensured by adding a reducing agent to the cement, the effectiveness of which is guaranteed for a predefined period of time and with the constant observance of adequate storage methods (reported in points 7.2 and 10.2). Pursuant to the above-mentioned Regulation, the use of the reducing agent entails the publication of the following information:

PACKAGING DATE	Written on the bag or on the delivery note
STORAGE CONDITIONS (*)	In special closed containers in a cool and dry place and in the absence of ventilation, with a guarantee of maintaining the integrity of the package
RETENTION PERIOD (*)	According to what is reported on the DDT (both for bagged and bulk products) and on each individual bag

(\*) to maintain the efficacy of the reducing agent

This time limit concerns only the efficacy of the reducing agent against chromium VI salts, without prejudice to the limits of use of the product dictated by the general rules of storage and use of the product itself.

Since cement is a mixture, as such it is not subject to the registration requirement under REACH, which concerns substances. Cement clinker is a substance exempted from registration, according to Art.

2.7 (b) and Annex V.10 of REACH, but subject to notification (Notification No. 02-2119682167-31-0000 - Notification Update of 1/7/2013 - Report Submission No. QJ420702-40).

For the use of Flue dust (dust deriving from the production process of clinker for Portland cement), REACH registration n° 01-2119486767-0064, the related Exposure Scenario (9.1) concerning the industrial production of hydraulic materials for building and construction has been developed and is available on request.

## 15.2 Chemical Safety Assessment

No chemical safety assessment is required.

## 16. OTHER INFORMATION

### 16.1 Indication of changes

This Safety Data Sheet has been revised pursuant to Regulation (EU) 2020/878 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and to take into account the update of the reference standards for Personal Protective Equipment.

The October 2023 revision relates to the corporate change.

### 16.2 Abbreviations and acronyms

ACGIH: American Conference of Industrial Hygienists

ADR/RID: Agreement on the transport of dangerous goods by road/Regulations on the international transport of dangerous goods by rail

APF: Assigned Protection Factor

CAS: Chemical Abstract Service

CLP: Classification, Labelling and Packaging (Regulation 1272/2008)

COPD: Chronic Obstructive Pulmonary Disease

DDT: Transport Document

DNEL: Derived no-effect level

PPE: Personal Protective Equipment

EC50: half maximale effective concentration

ECHA: European Chemical Health Agency



EPA: High Efficiency Air Filters (Particulate Matter)

FF P: Filtering Facepiece against Particles (disposable)

FM P: Filtering Mask against Particles with filter cartridge

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods

IMO: International Maritime Organization

IMSBC: International Maritime Solid Bulk Cargoes

LC50: Median lethal dose

MEASE: Metal Estimation and Assessment of Substance Exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php>

OEL: occupational exposure limit

PBT: Persistent, bioaccumulative and toxic

PNEC: Predicted no-effect concentration

PROC: Process Categories

RPE: Respiratory Protective Equipment

REACH: Registration, Evaluation and Authorization of Chemicals

SDS: Safety Data Sheet

STOT RE: Specific Target Organ Toxicity (Repeated Exposure)

STOT SE: Specific Target Organ Toxicity (Single Exposure)

TLV-TWA: Threshold Limit Value-Time Weighted Averages

UFI: Unique Formula Identifier

vPvB: Very persistent, very bioaccumulative

### 16.3 Bibliographical references and key data sources

- (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 4th ed. EPA-821-R-02-013, U.S. 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 5th ed. EPA-821-R-02-012, U.S. 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) Exposure to Thoracic Aerosol in a Prospective Lung Function Study of Cement Production Workers; Noto, H., et al; Ann. Occup. Hyg., 2015, Vol. 59, No. 1, 4–24
- (16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmgH for Eurometaux,
- (17) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

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

The following table lists the classification and the procedures adopted to derive the classification of the mixture pursuant to Regulation 1272/2008/EU (CLP)

Classification according to Regulation (EC) 1272/2008	Classification Procedure
Skin irritation 2, H315	Based on evidence data
Eye lesions 1, H318	Based on evidence data
Skin sensitization 1B, H317	Human Experience
STOT SE 3, H335	Human Experience

The data and test methods used for the classification of common cements are given in Section 11.1.

#### **16.5 Applicable Hazard Statements and Precautionary Statements (Respiratory or Skin Sensitization, Serious Eye Injury/Severe Eye Irritation, STOT-Single Exposure)**

See Section 2

#### **16.6 Training Advice**

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

#### **16.7 Further Information – Methods**

If applicable, the manufacturer/importer may attach the exposure scenario (SE) of the relevant substances subject to registration and classified as hazardous, if the information is not already contained in the factsheet.

#### **16.8 Disclaimer**

The information contained in this SDS reflects the current knowledge available and it is reliable to expect that the product will be used under the prescribed conditions and in accordance with the indications provided on the packaging and/or in the technical literature. For any other use of the product, including the use of the product in combination with other products or in other processes, the responsibility lies with the user.

It is implicit that the user is responsible for the specifically identified security measures and for the application of the appropriate operating procedures concerning the prevention of risks in its activities.

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