

Safety data sheet
i.active BIODYNAMIC
4th Edition – April 07, 2017

1. IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Cement-based dry premixed mortar, containing white photocatalytic cement, compliant to the applicable technical standards.

i.active BIODYNAMIC

1.2 Relevant identified uses of the mixtures and uses advised against

The dry premix is a cement-based white powder to be used - by simply adding water - as a highly flowable mortar grout for manufacturing non-structural architectural elements of complex geometry and thin section. The dry premixed mortar is intended for industrial and professional uses. The identified uses of the premix include the dry products and the products in a wet suspension (paste).

Process Categories (PROC) and Use Descriptors

PROC	Identified uses - Use description	Manufacture/ Formulation of Building and construction materials	Professional/ Industrial use of
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 processes for formulation of preparations* and articles (multistage and/or significant contact)	X	X
7	Industrial spraying		X
8a	Transfer of substance or preparation* (charging/discharging) from/to vessels/large containers at non-dedicated facilities		X
8b	Transfer of substance or preparation* (charging/discharging) 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 and only PPE available		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

*For the sake of consistency with the descriptor system in IUCLID 5.2, in the above table the term "preparation" has not been replaced by "mixture"

1.3 Details of the supplier of the safety data sheet

Italcementi S.p.A.
Via G. Camozzi, 124 – 24121 Bergamo
Telephone number: +39 035 396111
itc-reach@italcementi.it

1.4 Emergency telephone number

- Poison Centre - Hospital University Foggia, 71122 Foggia - V.le Luigi Pinto, 1 - Tel. 0039-0881-732326
- Poison Centre - Hospital "A. Cardarelli", 80131 Napoli - Via A. Cardarelli, 9 - Tel. 0039-081-7472870
- Poison Centre - Hospital "Umberto I", 00161 Roma - V.le del Policlinico, 155 - Tel. 0039-06-4450618
- Poison Centre - Hospital "A. Gemelli", 00168 Roma - Largo Agostino Gemelli, 8 - Tel. 0039-06-3054343
- Poison Centre - Hospital "Careggi" U.O. Tossicologia Medica, 50134 Firenze - Largo Brambilla, 3 - Tel. 0039-055-7947819
- Poison Centre – National center for toxicological information, 27100 Pavia - Via Salvatore Maugeri, 10 - Tel. 0039-0382-24444
- Poison Centre - Hospital Niguarda Ca' Granda, 20162 Milano - Piazza Ospedale Maggiore,3 - Tel. 0039-02-66101029
- Poison Centre - Hospital Papa Giovanni XXII, 24127 Bergamo - Piazza OMS, 1 Tel. 0039-800883300

Available outside office hours YES NO

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture

2.1.1 Classification according to Regulation (EC) No. 1272/2008 (CLP)

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

2.2 Label elements

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

Hazard Pictograms



Signal word

Danger

Hazard Statements

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



Precautionary statements

P102 Keep out of the reach of children.

P280: wear protective gloves / protective clothing /eye protection / face protection.

P305+P351+P338+P312: IN CASE OF CONTACT WITH EYES: rinse thoroughly with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a doctor / Poison Centre if you feel unwell.

P302+P352+P333+P313: IN CASE OF CONTACT WITH SKIN: wash thoroughly with soap and water. If skin irritation or a rash occurs, get medical advice/attention.

P261+P304+P340+P312: Do not breathe dust. IN CASE OF INHALATION: Move the exposed person to fresh air. Call a doctor / Poison Centre if you feel unwell.

P501: Dispose product/container in accordance regulation.

2.3 Other hazards

When the mixture is mixed with water, for instance when making concrete or mortar, or when it becomes wet, a strongly alkaline solution is produced (high pH caused by the formation of calcium, sodium and potassium hydroxides).

The mixture may irritate the eyes, the mucous system, the throat and the respiratory system and cause coughing. Frequent inhalation of the mixture over a long period of time increases the risk of developing lung diseases.

Frequent contact between the mixture and moist skin (due to sweat or humidity) over a long period of time may cause irritation and/or dermatitis (Reference [4]).

In case of prolonged contact with the skin, both the mixture and resulting pastes may cause skin sensitisation due to the presence of trace amounts of chromium VI salts. Where necessary, such an effect can be minimized by incorporating a special reducing agent to maintain the water-soluble chromium VI content to concentration rates below 0.0002% (2 ppm) on the total dry weight of cement, in compliance with the applicable legislation referred to in Section 5 (Reference [3]).

If significant amounts are ingested, the mixture may cause ulcers in the digestive tract.

Under normal conditions of use, the mixture does not pose any particular risk to the environment, provided that all recommendations given under Sections 6, 8, 12 and 13 below are followed.

The mixture does not fulfil the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation 1907/2006/EC).

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

3.2.1 Components presenting a health hazard

Substance	% weight	CE No.	CAS No.	Classification according to Regulation No. 1272/2008/EC		
				Hazard class	Hazard category	Hazard statement
Portland cement clinker	10-20	266-043-4	65997-15-1	Specific target organ toxicity (single exposure) Respiratory tract irritation	3	H335: may cause respiratory irritation
				Skin irritation	2	H315: causes skin irritation
				Serious eye damage / eye irritation	1	H318: causes serious eye damage
				Skin sensitisation	1B	H317: may cause an allergic skin reaction



Note:

- *Clinker: C& notification No. 02-2119682167-31-0000 (Notification update of July 1, 2013 - Submission of Report No. QJ420702-40).*

The dry premix is a mixture of finely ground powder, containing white photocatalytic cement, selected aggregates and special additives in compliance with the composition limits specified in the respective product standards set out in paragraph 15.1.

The mixture contains titanium dioxide (CAS: 13463-67-7 / EC Number: 236-675-5 / REACH Registration No. 01-2119489379-17-0000).

4. FIRST AID MEASURES

4.1 Description of first aid measures

General notes

In general, no personal protective equipment is needed for first aid responders who must avoid inhaling the mixture's dust or coming into contact with the wet mixture or with preparations containing the mixture (concrete, mortar, plaster, etc.). Where this is not possible, personal protective equipment should be worn as indicated in Section 8.

Following contact with eyes

Do not rub eyes in order to avoid possible cornea damage as a result of mechanical stress.

Remove contact lenses, if any. Incline head to injured eye, open the eyelid(s) widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for at least 20 minutes to remove all particles. If possible, use isotonic water (0.9% NaCl). Contact a specialist of occupational medicine or an eye specialist.

Following contact with skin

For dry cement, remove and rinse abundantly with water.

For the wet/moist mixture, wash skin with plenty of water and a pH-neutral soap or mild detergent intended for use on skin.

Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them.

Seek medical treatment in all cases of irritation or burn.

Following inhalation

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

Following ingestion

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

4.2 Most important symptoms and effects, both acute and delayed

Eyes: Eye contact with the mixture (dry or wet) may cause serious and potentially irreversible irritation or injuries.

Skin: The mixture may have an irritating effect on moist skin (due to sweat or humidity) after prolonged contact or may cause contact dermatitis after repeated contact.

For more details see Reference (1).

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

Ingestion: If accidentally ingested, the mixture may cause burns to the digestive tract.

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

4.3 Indication of any immediate medical attention and special treatment needed

See 4.1. When contacting a physician, take this SDS with you.



5. FIREFIGHTING MEASURES

5.1 Extinguishing media

The mixture is not flammable. In case of fire, use extinguishing media appropriate to surrounding conditions.

5.2 Special hazards arising from the mixture

The mixture is non-combustible and non-explosive and will not facilitate or sustain the combustion of other materials.

5.3 Advise for firefighters

The mixture poses no fire-related hazards. No need for special protective equipment for firefighters.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear protective equipment as described under Section 8 and follow the advice for safe handling and use as given under Section 7.

6.1.2 For emergency responders

Emergency procedures are not required. However, eye, skin and respiratory protection equipment is needed in situations with high dust levels.

6.2 Environmental precautions

Do not wash the mixture down sewage or drainage systems or into bodies of water (e.g. streams).

6.3 Methods and material for containment and cleaning up

Use dry clean-up methods such a vacuum clean-up or vacuum extraction (industrial portable units, equipped with high efficiency air filter or equivalent techniques), which do not cause airborne dispersion. Never use compressed air. Ensure that workers wear the appropriate personal protective equipment (see Section 8) to avoid inhalation of dust from the mixture and contact with skin and eyes.

Place spilled materials into a container for future use.

In case of large spillage of the mixture, close/cover any waste water pit in close proximity.

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 as given under Section 8. To clean up the dry mixture, see Subsection 6.3.

Fire prevention measures

No preventive measure is needed as the mixture is neither combustible nor flammable.

Measures to prevent aerosol and dust generation

Do not sweep and do not use compressed air. Use dry clean-up methods such as vacuum clean-up or vacuum extraction, which do not generate airborne dust.

Environmental protection measures

When handling the material, avoid dust development.

7.1.2 Advice on general occupational hygiene

Do not eat, drink or smoke while handling or bagging the mixture.

In dusty environments, wear dust mask and protective goggles.



Use protective gloves to avoid skin contact.

7.2 Conditions for safe storage, including any incompatibilities

The mixture should be stored in waterproof, dry (i.e. with internal condensation minimised) and clean conditions and protected from contamination.

Engulfment hazard: the mixture can build up or adhere to the walls of the confined space where it is stored. The mixture can release, collapse or fall unexpectedly.

To prevent engulfment or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains the mixture without taking the proper safety measures.

Keep the mixture away from the reach of children, away from acids, in suitably devised closed containers (storage silos and bags), in a cool and dry place, protected from excessive draught to maintain technical properties while avoiding airborne dust development (see Section 10).

7.3 Specific end use(s)

No further information about specific end uses (see Subsection 1.2).

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control parameters

The Threshold Limit Value – Time Weighted Average (TLV-TWA) adopted by ACGIH, the American Conference of Governmental Industrial Hygienists for Portland cement in the workplaces is 1 mg/m³ (respirable dust fraction).

Exposure level:

DNEL (respirable dust fraction): 1 mg/m³

DNEL (skin): not applicable

DNEL (ingestion): not relevant

Environmental risk assessment:

PNEC (water): not applicable

PNEC (sediment): not applicable

PNEC (soil): not applicable

8.2 Exposure controls

For each Process Category (PROC), users can choose between options A) and B) shown in Table 8.2.1 below, depending on what is most appropriate to their specific situation. If an option is chosen, it must be indicated in Table 8.2.2 “Individual protection measures such as personal protection equipment – Specifications for respiratory protection equipment”. Hence, only combinations between A) – A) and B) – B) are possible.

8.2.1 Appropriate engineering controls

At plants where the mixture is handled, conveyed, loaded, unloaded and stored, appropriate engineering measures shall be taken to protect the workers’ health and to minimise dust propagating in the work environment as indicated in the table (DNEL = 1 mg/m³). Localised controls shall be defined in relation to the existing conditions and the corresponding special equipment shall be identified according to the table given under Subsection 8.2.2.

Table 8.2.1

Exposure Scenario	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week); (#) < 240 minutes	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 and construction materials (indoor, outdoor)	2		Not required	-
	14, 22, 26		A) Not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		Generic local exhaust ventilation	78%



Industrial uses of wet suspension of hydraulic building and construction materials	7	A) Not required or B) generic local exhaust ventilation	- 78 %
	2, 5, 8b, 9, 10, 13, 14	Not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2	A) Not required or B) generic local exhaust ventilation	- 72 %
	9, 26	A) Not required or B) generic local exhaust ventilation	- 72 %
	5, 8a, 8b, 14	Generic local exhaust ventilation	72 %
	19 (#)	Localised controls are not applicable, process only in well-ventilated rooms or outdoors	50 %
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) Not required or B) generic local exhaust ventilation	- 72 %
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	Not required	-

*PROC they are identified uses as defined in Section 1.2.

8.2.2 Individual protection measures such as personal protection equipment

General: At plants where the mixture is handled, conveyed, loaded and unloaded, appropriate engineering measures shall be taken to protect the workers' health and to minimise dust propagating in the work environment. Do not eat, drink or smoke during mixing or pouring operations to avoid contact with the skin or mouth. Immediately after handling the mixture, workers should wash or shower with a pH-neutral soap or mild detergent intended for use on skin. Remove contaminated clothing, footwear, glasses/goggles, etc. and clean thoroughly before re-using them.

Where personal protection is necessary, the following personal protective equipment (PPE) shall be used:

Eye/face protection



Wear approved glasses or safety goggles according to EN 166 when handling dry or wet cement and cement-containing mixes to prevent contact with eyes.

Skin protection



Use impervious, abrasion- and alkali-resistant gloves according to EN 374 – parts 1, 2 and 3.

Wear long-sleeved protective clothing, safety shoes or boots as well as skin care products (including moisturising creams) to protect the skin from prolonged contact with wet the mixture.

Respiratory protection



When a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection. The type of respiratory protection should be adapted to the dust level and conform to the relevant EN standard (e.g. UNI EN 149-certified filtering half-mask).



The personal protective equipment (PPE), defined as a function of local controls and assessed for a DNEL value = 1 mg/m³, is specified in Table 8.2.2.

Table 8.2.2

Exposure scenario	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift; 5 shifts a week) (#) x 240 minutes	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, 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 suspension 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 use of dry hydraulic building and construction materials (indoor, 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 use 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	-	

*PROC they are identified uses as defined in Section 1.2.

A review of the APFs of the different RPE (in accordance with EN 529:2005) is available in the MEASE Glossary (16).

Thermal hazards

Not applicable

8.2.3 Environmental exposure controls

Refer to engineering controls (Subsection 8.2.1) to prevent the mixture from dispersing into the environment. Adopt all measures to ensure that the mixture does not reach water (waste, ground or surface water). At plants where the mixture is handled, conveyed, loaded, unloaded and stored, appropriate engineering measures shall be taken to minimise dust propagating in the work environment. In particular, adequate preventive actions should be taken to ensure that the concentration of respirable cement dust is kept below the time weighted threshold limit (TLV-TWA) adopted for Portland cement by ACGIH, the American Conference of Industrial Hygienists. Environmental exposure control for the emission of cement particles into air must be in accordance with the available technology and in compliance with the applicable regulations for the emission of general dust particles.

Environmental exposure control is relevant for the aquatic environment as emissions of cement in the different life-cycle stages (production and use) mainly apply to ground and waste water. The aquatic effect and risk assessment cover the effect on organisms/ecosystems due to possible pH changes related to hydroxide discharges. The toxicity of other dissolved inorganic ions is expected to be negligible compared to the potential pH effect.

Any effects that might occur during production and use would be expected to take place on a local scale. The pH of 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 that assessment of exposure, a stepwise approach is recommended:

Tier 1: Retrieve information on effluent pH and the contribution of the cement on the resulting pH. Should the pH be above 9 and be predominantly attributable to cement, 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 shall not exceed the value of 9.

Tier 3: Measure the pH in the receiving water after the discharge point. If pH is below 9, safe use is reasonably demonstrated. If pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thus ensuring safe use of cement during production or use phase.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- (a) **Appearance:** The premix is a finely ground inorganic material that comes in powder form and white in colour.
- (b) **Odour:** Odourless
- (c) **Odour threshold:** No odour threshold, odourless
- (d) **pH:** (T = 20°C in water, solid/water ratio 1:2): 12-13
- (e) **Melting point:** Not applicable
- (f) **Initial boiling point and boiling range:** Not applicable
- (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
- (l) **Vapour density:** Not applicable
- (m) **Relative density:** 2.75-3.50; Apparent density: 1450-1500 kg/cm³
- (n) **Solubility(ies) 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 mixture
- (p) **Self-ignition temperature:** Not applicable (no pyrophoricity – no organo-metallic, organo-metalloid or organo-phosphine bindings or of their derivatives, and no other pyrophoric constituent in the composition)
- (q) **Decomposition temperature:** not applicable as no organic peroxide is present
- (r) **Viscosity:** not applicable as it is not a liquid
- (s) **Explosive properties:** not applicable. Not explosive or pyrotechnic. Not in itself capable by chemical reaction of producing gas at such temperature and pressure and at such a speed as to cause damage to the surroundings. Not capable of a self-sustaining exothermic chemical reaction.
- (t) **Oxidising properties:** Not applicable as it does not cause or contribute to the combustion of other materials.

9.2 Other information

Not applicable.

10. STABILITY AND REACTIVITY

10.1 Reactivity

When mixed with water, the mixture will harden into a stable mass that is not reactive in normal environments.

10.2 Chemical stability

The mixture "as is" remains stable as long as it is properly stored (see Section 7). It should be kept dry. Contact with incompatible materials should be avoided.

The wet mixture is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble materials. When in contact with hydrofluoric acid, the mixture dissolves to produce corrosive silicon tetrafluoride gas. The mixture reacts with water to form silicates and calcium hydroxide. Silicates in the mixture react with



powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride and oxygen difluoride.

Intact packaging and compliance with the appropriate storage conditions as indicated in Subsection 7.2 (adequate tightly closed and sealed containers, dry and cool place, no ventilation) are the essential conditions to keep the effectiveness of the reducing agent unaltered throughout the shelf life declared on each bag or on the delivery documents.

10.3 Possibility of hazardous reactions

The mixture does not cause hazardous reactions.

10.4 Conditions to avoid

Humid conditions during storage may cause lump formation and loss of product quality.

10.5 Incompatible materials

The wet mixture is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble materials. When in contact with aluminium powder, wet cement and wet cement-containing mixtures cause the production of hydrogen.

10.6 Hazardous decomposition products

The mixture will not decompose into any hazardous products.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Hazard class	Cat	Effect	Reference
Acute toxicity – dermal	-	Limit test, rabbit, 24 hours' contact, 2,000 mg/g body weight – no lethality. Based on available data, the classification criteria are not met.	(2)
Acute toxicity – inhalation	-	No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met.	(9)
Acute toxicity – oral	-	No indication of oral toxicity from studies with cement kiln dust. Based on available data, the classification criteria are not met.	Literature survey
Skin corrosion/irritation	2	Cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns.	(2) Human experience
Serious eye damage/irritation	1	Clinker caused a mix picture of corneal effects and the calculation irritation index was 128. Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact by larger amounts of dry cement or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns and blindness.	(10), (11)
Skin sensitisation	1B	Some individuals may develop eczema upon exposure to wet cement dust, caused either by the high pH, which induces irritant contact dermatitis after prolonged contact, or by an immunological reaction to soluble Cr (VI), which elicits allergic contact dermatitis. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis and is a combination of the two above-mentioned mechanisms. If the cement contains a soluble Cr(VI)-reducing agent and as long as the mentioned period of effectiveness of the chromate reduction is not exceeded, a sensitising effect is not expected [Reference (3)].	(3), (4), (17)
Respiratory sensitisation	-	There is no indication of sensitisation of the respiratory system. Based on available data, the classification criteria are not met.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met.	(12), (13)



Carcinogenicity	-	No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen. Portland cement is not classifiable as a human carcinogen (according to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent with one of the other notations). Based on available data, the classification criteria are not met.	(1) (14)
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience
STOT – single exposure	3	Cement dust may irritate the throat and respiratory tract. Coughing, sneezing and shortness of breath may occur following exposures in excess of occupational exposure limits. Overall, the pattern of evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, evidence available at the present time is insufficient to establish with any confidence the dose-response relationship for these effects.	(1)
STOT – repeated exposure	-	There is an indication of COPD. The effects are acute and due to high exposures. No chronic effects or effects at low concentration have been observed. Based on available data, the classification criteria are not met.	(15)
Aspiration hazard	-	Not applicable as cement is not used as an aerosol.	

Apart from skin sensitisation, Portland cement clinker and common cements have the same toxicological and ecotoxicological properties.

Medical conditions aggravated by exposure

Inhalation of the mixture can aggravate pre-existing respiratory diseases and/or medical conditions, such as emphysema or asthma, and/or pre-existing skin and eye diseases.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

The mixture is not hazardous to the environment. Ecotoxicological tests with Portland cement on Daphnia Magna [Reference (5)] and Selenastrum coli [Reference (6)] have shown little toxicological impact. Therefore, LC50 and EC50 values could not be determined [Reference (7)]. There is no indication of sediment phase toxicity [Reference (8)]. However, the addition of large amounts of cement to water may cause the pH to rise and may, therefore, be toxic to aquatic life under certain circumstances.

12.2 Persistence and degradability

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

12.3 Bio accumulative potential

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

12.4 Mobility in soil

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

12.5 Results of PBT and vPvB assessment

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

12.6 Other adverse effects

Not relevant.



13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Disposal of the mixture and any packaging shall be managed pursuant to Section IV "Waste treatment regulations" in Legislative Decree 152/2006 "Environmental Regulations", subsequent amendments and integrations and all related implementing decrees.

14. TRANSPORT INFORMATION

The mixture does not meet the definition of any hazard class under the International regulation on the transport of dangerous goods (IMDG/sea, ADR/road, RID/rail, ICAO/IATA/air).

No special precautions are needed apart from those mentioned under Section 8.

Used closed containers to prevent airborne dispersion during transport.

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 and the IBC Code

In compliance with the provisions in Appendix C of the IMSBC/International Maritime Solid Bulk Cargoes code, adopted by IMO/International Maritime Organization by Resolution MSC 268(85):2008 and subsequent amendments and integrations, incorporated in Decree No. 1340 of November 30, 2010, of the Italian Ministry of Infrastructures and Transport.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulation/legislation specific for the mixture

- Regulation (EC) No. 1907 of 18/12/2006 "Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)"
- Regulation (EC) No. 987 of 8/10/2008 amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Authorisation and Restriction of Chemicals (REACH) as regards Annexes IV and V
- Ministry of Health's Decree of 10/05/2004 implementing Directive 2003/53/EC of the European Parliament and of the Council of 18 June 2003 amending for the twenty-sixth time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate and cement)
- Ministry of Health's Decree of 17/02/2005 adopting a test method for cements with reference to the Ministerial Decree of 10/05/2004 implementing the twenty-sixth amendment of Council Directive 76/769/CEE
- Regulation (EC) No. 552 of 22/06/2009 amending Regulation (EC) No. 1907 as regards Annex XVII
- Regulation (EC) No. 1272 of the European Parliament and of the Council of 16/12/2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 199/45/EC, and amending Regulation (EC) No. 1907/2006



- COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)”
- Commission Regulation (EU) No 487/2013 of 8 May 2013 amending, 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 (Official Journal of the European Union L149 of June 1, 2013)
- Legislative Decree No. 81 of 09/04/2008 and subsequent amendments regarding “Occupational health and safety”. Cement users shall apply all technical and organizational measures as specified in said Decree, taking into account the indications regarding exposure control and provision of adequate PPE as given under Section 8.
- EN 196-10 – “Methods of testing cement - Part 10: Determination of the water-soluble chromium (VI) content of cement”
- EN 197-1 – “Cement - Part 1: Composition, specifications and conformity criteria for common cements”
- Legislative Decree 152/2006 “Environmental Regulations”

According to Annex XVII, Point 47, under Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as amended by Regulation No. 552/2009, cement and cement-containing mixtures shall not be placed on the market or used if they contain, after mixing with water, more than 0.0002% (2 ppm) of soluble chromium (VI) of the total dry weight of the cement. **Considering that white cement, once mixed with water, does not contain more than 0.0002% (2 ppm) of soluble Cr(VI) of the total dry weight of the cement, the mix can be marketed without the addition of reducing agents.**

Cement is a mixture and, as such, is not subject to REACH registration, which is mandatory for substances. Cement clinker is a substance but it is exempt from registration pursuant to article 2.7 (b) and Annex V.10 of REACH.

Should some substances used in the cement require REACH registration and the provision of the related exposure scenarios, such information will be introduced as an annex to the SDS as soon as it becomes available.

15.2 Chemical Safety Assessment

Not required

16. OTHER INFORMATION

16.1 Indication of changes

This Safety Data Sheet has been modified to implement provisions pursuant to Regulation (EC) No.1272/2008 and Annex II to Regulation (EC) No. 453/2010, in force since June 01, 2015.

16.2 Abbreviations and acronyms

ACGIH: American Conference of Industrial Hygienists

ADR/RID: European Agreement concerning the International Carriage of Dangerous Goods by Road / Regulations concerning the International Carriage of Dangerous Goods by Rail

APF: Assigned protection factor

CAS: Chemical Abstract Service

COPD: Chronic Obstructive Pulmonary Disease

DNEL: Derived no-effect level

EC50: half maximal effective concentration

EPA: Type of high efficiency air filter

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods

IMO: International Maritime Organization

IMSBC: International Maritime Solid Bulk Cargoes

LC50: Median lethal dose

OEL: Occupational exposure limit value

PBT: Persistent, bio-accumulative and toxic

PNEC: Predicted no-effect concentration

PROC: Process category

REACH: Registration, Evaluation and Authorisation of Chemicals

SDS: Safety Data Sheet

STOT: Specific Target Organ Toxicity



TLV-TWA: Threshold Limit Value -Time Weighted Average
vPvB: very Persistent, very Bio-accumulative

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.
- (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, US EPA, office of water, Washington D.C. (2002).
- (6) U.S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 4th ed. EPA/600/4-90/027F, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1993) and 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (2002).
- (7) Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D.C., 2001.
- (8) Final report Sediment Phase Toxicity Test Results with *Corophium volutator* for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.
- (9) TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.
- (10) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.
- (11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.
- (12) Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Van Berlo et al, *Chem. Res. Toxicol.*, 2009 Sept; 22(9):1548-58.
- (13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.
- (14) Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008.
- (15) Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.
- (16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmgH for Eurometaux, <http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php>
- (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 Training advice

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

16.5 Further information

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

The table below lists the methods of classification and procedures implemented to classify the mixture pursuant to Regulation (EC) 1272/2008 (CLP).



Classification according to Regulation (EC) No. 1272/2008	Classification procedure
H315: causes skin irritation, 2	test
H318: causes serious eye damage, 1	test
H317: may cause an allergic skin reaction, 1B	Human experience
H335: may cause respiratory irritation, 3	Human experience

This SDS, updated in compliance with the provisions set forth in REACH, is also available in electronic format from www.i-nova.net

16.6 Disclaimer

The information on this data sheet reflects the currently available knowledge and is reliable provided that the product is used under the prescribed conditions. Any other use of the product, including the use of the product in combination with any other product or any other process, is the responsibility of the user.

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



Green Building Council (GBC) Italia promuove dal 2008 il sistema di certificazione indipendente LEED® – *Leadership in Energy and Environmental Design* – i cui parametri stabiliscono precisi criteri di progettazione e realizzazione di edifici salubri, energeticamente efficienti e a impatto ambientale contenuto. **Italcementi è tra i soci fondatori di GBC.**

