Buzzi Unicem

SAFETY DATA SHEET
BUZZI UNICEM "Next Expansive®"

Issue date: 01/01/2023	Revision date: **01/08/2026 - rev. 3**

Section 1. IDENTIFICATION OF THE MIXTURE AND THE COMPANY

1.1 Product identifier: BUZZI UNICEM "Next Expansive®"

(Commercial code: **SN18)** *(hereinafter referred to as mixture)*

UFI
T410-J07Y-J003-8Y1K

1.2 Relevant identified uses of the mixture and uses advised against

Expanding additive powder made with sulphoaluminate to be used at a dosage between 8% to 15% of Portland cements; depending on this dosage and the specific environmental conditions of curing, the mixture can compensate for shrinkage and expansion of concrete.

PROC	Process categories – Identified uses	Producer / Formulation in building materials	Professional / Industrial use in building materials
2	Use in closed and 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 the formulation of preparations (*) and articles (multistage and/or significant contact)	X	X
7	Industrial spray application		X
8a	Transfer of a substance or preparation (*) (filling/emptying) from/to vessels/large containers at non-dedicated facilities		X
8b	Transfer of a substance or preparation (*) (filling/emptying) from/to vessels/large containers at dedicated facilities	X	X
9	Transfer of a substance or preparation (*) in 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 by dipping and pouring		X
14	Production of preparations (*) or articles by tableting, compression, extrusion, pelletization	X	X
19	Manual mixing with direct contact, with only the use of personal protective equipment (PPE)		X
26	Handling of solid inorganic substances at room temperatures	X	X

(*) NB: To stay consistent with the descriptor system indicated in IUCLID 5.2, in the table the term "preparation" was not replaced with the new definition of "mixture".

1.3 Information on the supplier of the Safety Data Sheet (SDS)

BUZZI UNICEM s.r.l.
Via Luigi Buzzi 6
15033 Casale Monferrato (AL)
tel. 0142 416411
e-mail of manager issuing the SDS: reach@buzziunicem.it

1.4 Emergency telephone number: **0382 24444 -** Pavia Poison Center *(see also paragraph 16.7)*

Available outside office hours? ☒ YES 24 hours/day.

Section 2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture

Pursuant to Regulation (EC) No. 1272/2008 (CLP).

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

2.2 Label elements

Pursuant to Regulation (EC) No. 1272/2008 (CLP)

Warnings

Danger

Risk phrases

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

Precautionary statements

P102: Keep out of reach of children.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+ P338+P310:	IN CASE OF CONTACT WITH EYES: rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do; continue rinsing. If you feel unwell, Immediately contact a Poison Center or a doctor.
P302+P352+ P333+P313:	IN CASE OF CONTACT WITH SKIN: wash with plenty of soap and water; if skin irritation or rash occurs, seek medical advice/attention.
P261+P304+ P340+P312:	Avoid breathing in dust. IN CASE OF INHALATION: remove victim to fresh air and keep at rest in a position comfortable for breathing Contact a Poison Center or doctor if you feel unwell.
P101:	If medical advice is needed, have product container or label at hand.
P501:	Dispose of the product/container in compliance with current regulations.

2.3 Other hazards

The mixture, when it is mixed with water (for example in the production of mortars or plasters) or when it gets wet, produces a strong alkaline solution (high pH due to the formation of hydroxides of calcium, sodium and potassium).

Repeated inhalation of the mixture powder, for a long period of time, increases the risk of onset of lung diseases (especially, in the presence of prolonged and repeated exposure to airborne dust from formulations of the mixture possibly containing silica components *– for additional information see paragraph 15.1).*

Repeated and prolonged contact with the mixture and/or paste on wet skin (due to transpiration or humidity) can cause irritation and/dermatitis *[References (4)].*

Both the mixture and its paste, when in prolonged contact with the skin, can cause sensitisation and / or allergic reaction in some individuals due to the presence in traces of chromium VI salts; where necessary, the effect can be ameliorated by the addition of a specific reducing agent to keep the content of soluble chromium VI in concentrations less than 0.0002% (2 ppm) of the total dry weight, in accordance with the regulations in paragraph15.1 *[References (3)].*

If swallowed in significant quantity, the mixture may cause ulceration of the digestive system.

Under normal conditions of use, the mixture and its paste does not present any special environmental risk, subject to compliance with the

recommendations in paragraphs 6, 8, 12 and 13.

The mixture does not meet the criteria for PBT or vPvB, pursuant to Annex XIII of Regulation 1907/2006/CE “REACH”.

Cement may contain respirable crystalline silica

Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Non applicable.

3.2 Mixtures

“BUZZI UNICEM Next Expansive®” is an inorganic product, consisting of a mixture of finely ground sulphoaluminate clinker ($4CaO.3Al_2O_3.SO_3$ – commonly defined as C_4A_3S - in a percentage higher than 30%), of the expanding type and deliberately rich in free lime (CaO not combined) and containing calcium oxide and anhydrite.

The sulphoaluminate clinker, produced by the firing kiln at a temperature of about 1350 °C in granular form, has a mineralogical composition characterized by a significant content of sulphates in part related to calcium silicates, in part present as calcium sulphate, sodium and potassium. It also contains calcium oxides and magnesium, as well as traces of other compounds, including chromium IV salts.

The products of sulphoaluminate cement hydration (sulphoaluminates of calcium hydrate, calcium hydroxide, silicates and aluminates of calcium hydrates), although in different proportions, are similar to those found in Portland cement hydration.

For this reason, and also taking into account the physical and chemical composition of sulphoaluminate clinker as being quite similar to that of Portland cement clinker, the potential risks related to its use are considered to be the same as those from Portland cement (see also paragraph 15.1).

3.2.1 Components that present a health hazard

Constituent	% in weight	EC Number	CAS	"REACH" Registration no.	Classification pursuant to Regulation 1272/2008/EC		
					Hazard class	Hazard category	Hazard indication
Sulphoaluminate clinker **($Ca_4Al_6SO_{16}$ = $4CaO.3Al_2O_3.SO_3$)**	**30% - 100%**	**895-411-2**	**960375-09-1**	**Free from (*)**	**Skin irritation** **Skin sensitization** **Eye damage** **STOT SE**	**2** **1B** **1** **3**	**H315** **H317** **H318** **H335**
calcium oxide	**0% - 30%**	**215-138-9**	**1305-78-8**	**01-2119862019-36-xxxx**	**Skin irritation** **Eye damage** **STOT SE**	**2** **1** **3**	**H315** **H318** **H335**

(*) clinker: C&L notice no. 02-2119682167-31-0000 dated 15/12/2010; updated on 07/01/2013 with presentation of Report QJ420702-40.

Other components (substances or mixtures) can also be used in the mixture, such as anhydrate (anhydrous calcium sulphate - $CaSO_4$) and products made with calcium oxide (CaO), having toxicological characteristics and risk levels which, in any case, are equal to or lower than those of the clinker.

Section 4. FIRST AID MEASURES

4.1 Description of first aid measures

General notes

Rescue workers do not need personal protective equipment, but they must avoid inhaling the dust and contact with the wet mixture. If this is not possible, they must use the personal protective equipment described in Section 8.

In case of inhalation

Move the person to fresh air; dust in throat and nostrils should be eliminated naturally. Contact a doctor if irritation persists, or if it subsequently occurs, or if the person experiences discomfort, coughing or if other symptoms persist.

In case of contact with skin

For dry mixture, remove and rinse thoroughly with water.
For wet or humid mixture, wash the affected area with plenty of water and neutral pH soap or a suitable mild detergent; also, remove contaminated clothing, shoes, glasses, watches, etc. and clean thoroughly before wearing them again. Consult a doctor in all cases of irritation or burns.

In case of contact with eyes

Do not rub your eyes to prevent corneal damage caused by the rubbing. If worn, remove contact lenses. Tilt the head in the direction of the affected eye, open your eyelids and rinse immediately with plenty of water for at least 20 minutes to remove all residue; If possible, use isotonic water (0.9% NaCl).
If necessary, contact a specialist in occupational medicine or an eye specialist.

If swallowed

Do not induce vomiting. If the person is conscious, rinse their mouth with plenty of water; consult a doctor or contact a Poison Control Centre immediately.

4.2. Main symptoms and effects, both acute and delayed

Eyes: in contact with the eyes, the powder mixture (dry or wet) may cause irritation or serious and potentially irreversible injury.

Skin: the mixture and/or its preparations may have an irritating effect on moist skin (due to sweat or humidity) after prolonged contact or may cause dermatitis after repeated and prolonged contact. In addition, prolonged contact of the skin with the moist mixture and/or its moist preparations (mortars, plasters, etc.) can cause irritation, dermatitis or burns. *[for additional details, see References (1)]*

***Inhalation*:** **r**epeated inhalation of the mixture powder for a long period of time increases the risk of onset of lung diseases.

***Ingestion*:** accidental ingestion of the mixture can cause ulcers of the digestive tract.

Environment: under normal conditions of use, the mixture is not hazardous for the environment.

4.3. Indications for any immediate medical attention and special treatment needed

See the instructions provided in paragraph 4.1; if necessary, consult a doctor, providing the latter with the Safety Data Sheet (SDS).

Section 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

The mixture is non-flammable. So, in the event of fire in the surrounding area, all fire extinguishing means can be used.

5.2 Special hazards associated with the mixture

The mixture is not combustible or explosive and does not facilitate or contribute to the combustion of other materials.

5.3 Advice for firefighters

The mixture does not present any fire risk; therefore no special protective equipment is required for firefighters.

Section 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

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

6.1.2 For emergency responders

No specific emergency procedures are required. In any event, protective equipment for eyes, skin and respiratory tract must be worn in the presence of high levels of dust.

6.2 Environmental precautions

Avoid discharging or dispersing the mixture into drains and/or sewers and/or water bodies (e.g., streams).

6.3 Methods and materials for containment and cleaning

Dry mixture

Use appropriate dry cleaning methods, such as vacuum cleaners or vacuum extractors [industrial portable units, equipped with high efficiency particulate filters or technical equivalent], that do not disperse dust into the environment. Never use compressed air.
Alternatively, remove the dust, moistening the material and collect it using a broom or sweeping brushes. If this is not possible, wet the mixture with water (see: wet mixture).
Make sure the workers wear suitable personal protective equipment (see Section 8), in order to prevent inhalation of dust and contact with skin and eyes.

Deposit the spilled material in containers. In case of spills of large amounts of the mixture, close or cover any water collection sumps there may be in the immediate vicinity.

Wet mixture

Remove and collect the mixture in containers, wait for it to dry and harden before disposing of it as described in Section 13.

6.4 Reference to other sections

For additional details, see Sections 8 and 13.

Section 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Follow the recommendations provided in Section 8.
To remove the dry mixture, see paragraph 6.3.

Fire prevention measures

No precautions are necessary since the mixture is neither combustible nor flammable.

Measures for preventing the formation of spray and dust

Do not sweep or use compressed air. Use dry cleaning systems (such as, for example, vacuum cleaners or vacuum extractors) that do not cause dust to scatter into the air.

Environmental protection measures

When handling the mixture, avoid its dispersion into the environment (see also paragraph p. 6.2)

7.1.2 General information on health and safety in the workplace

Do not eat or drink in a workplace where the mixture is handled or stored.
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

The mixture must be stored out of reach of children, away from acids, in suitable closed containers (silos and storage bags), in a cool, dry, unventilated place to preserve its technical characteristics, with no, in any case, emission of dust (see Section 10).

Risk of burial: the mixture can thicken or stick to the walls of the confined space in which it is stored; the mixture may landslide, collapse, or disperse unexpectedly.

To prevent the risk of burial or suffocation (during maintenance work and cleaning or unclogging operations) do not enter confined spaces – e.g. silos, hoppers, or other vehicles for bulk transport or other containers and/or vessels that store and contain the mixture – without adopting specific safety procedures and wearing suitable personal protective equipment.

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

7.3 Specific end uses

No additional information (see also paragraph 1.2).

7.4 Effectiveness of the reducing agent for soluble chromium VI

The intactness of the package and compliance with the storage conditions mentioned above are prerequisites to ensure the continued effectiveness efficacy of the reducing agent for the time period of time indicated in the delivery note or on each single bag.

The expiry relates solely to the effectiveness of the reducing agent in maintaining the level of soluble chromium VI, determined according to EN 196-10, under the limit of 0.0002% of the total dry weight of the ready-to-use mixture, imposed by current legislation (see paragraph 15.1), subject to the limits of use of the product dictated by the general rules of conservation and use of the product.

Section 8. EXPOSURE/PERSONAL PROTECTION CONTROLS

8.1 Control parameters

Please refer to the time-weighted threshold limit value (TLV-TWA), adopted for the workplace by the Association of American Industrial Hygienists (ACGIH), with regard to particulate of Portland cement, i.e., 1 mg per m^3 (respirable fraction).

Quantification of the **exposure level** (DNEL = Derived No-Effect Level):

- DNEL (respirable fraction): 1 mg/m^3
- DNEL (skin): not applicable
- DNEL (ingestion): not relevant

Instead, the method used for risk assessment, MEASE *[see References (17)]* refers to the inhalable fraction. Therefore, a further protective condition is implicitly correlated to the procedure for assessing the risk of occupational exposure. For workers, there are no data or studies or actual experience for defining the DNEL limit for skin exposure; moreover, since the mixture dust is classified as irritant to skin and eyes, appropriate protective measures must be adopted to avoid contact.

For the assessment of **environmental risk** (PNEC = Predicted No Effect Concentration) we have:

- PNEC for water: not applicable
- PNEC for sediments: not applicable
- PNEC for soil: not applicable

The risk assessment for ecosystems is based on the impact of the pH on water resources; however, the pH of surface water, water courses or in systems carrying water to purification plants should not be higher than 9.

8.2 Exposure controls

For each Process Category (PROC), the user can choose between options (A) and (B) shown in Table 8.2.1 below, according to the actual situation at the Plant.

After choosing the option, it must also be selected in Table 8.2.2 of Section 8.2.2 "*Individual protection measures, such as personal protective equipment – Specifications for respiratory tract protective equipment*"; therefore, the only possible combinations are between (A)-(A) and (B)-(B).

8.2.1 Suitable engineering controls

At facilities where the mixture is handled, transported, loaded, unloaded and stored, suitable health and safety measures must be taken for the protection of workers and to contain the dispersion of dust in the workplace, as shown in the table (evaluated for a DNEL value = 1 mg/m^3). Localized controls will be defined depending on the existing situations, and consequently, the specific corresponding equipment for respiratory tract protection will be identified, as indicated in the Table found in paragraph 8.2.2.

Table 8.2.1

Exposure Scenario	PROC (*)	Exposure	Localized controls	Efficiency
Industrial production/ Formulation of hydraulic materials for building and construction	2, 3	Duration not limited (up to 480 minutes per shift, 5 shift per week)) (#) < 240 min	Not required	-
	14, 26		A) not required, or B) general local ventilation	- 78 %
	5, 8b, 9		General local ventilation	78 %
Industrial uses of dry hydraulic materials for building and construction (indoors and outdoors)	2		Not required	-
	14, 22, 26		A) not required, or B) general local ventilation	- 78 %
	5, 8b, 9		General local ventilation	78 %
Industrial uses of wet suspensions of hydraulic materials for building and construction	7		A) not required, or B) general local ventilation	- 78 %
	2, 5, 8b, 9, 10, 13, 14		Not required	-
Professional uses of hydraulic materials for building and construction (indoors and outdoors)	2		A) not required, or B) general local ventilation	- 72 %
	9, 26		A) not required, or B) general local ventilation	- 72 %
	5, 8a, 8b, 14		General local ventilation	72 %
	19 (#)		Localized controls are not applicable. The processes can only be executed in well-ventilated rooms or outdoors	-
Professional uses of wet suspensions of hydraulic materials for building and construction	11		A) not required, or B) general local ventilation	- 72 %
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		Not required	-

(*) PROCs are the identified uses, as defined in paragraph 1.2.

8.2.2 Individual protection measures, such as Personal Protective Equipment (PPE)

General:

At facilities where the mixture is handled, transported, loaded and unloaded, and stored, suitable measures must be taken for the protection of workers and for the containment of releases into the work environments.

Do not eat, drink or smoke while handling the mixture, to avoid contact of the powder with skin or mouth.

Remove contaminated clothing, shoes, glasses and clean them thoroughly before using them again.

In case of manipulation of the mixture, use the PPE listed here below; immediately after handling/manipulating the mixture or products/preparations containing it, wash with mild or suitable mild detergent or use moisturizing lotions.

Eyes/face protection

Wear goggles or safety masks certified pursuant to UNI EN 166 when handling the mixture so as to prevent any contact with the eyes.

Skin protection

Use gloves with mechanical abrasion resistance according to EN ISO 388 with nitrile, neoprene or polyurethane coating, preferably for ¾ or totally in case of more strenuous activities. In case of possible contact with the wet substance use gloves with specific chemical protection according to EN ISO 374 with specific thickness and degree of permeation (especially to alkalis) according to the type of use (immersion or possible accidental contact). Always change damaged or drenched gloves immediately. In some circumstances, waterproof pants or knee pads may be necessary.

Respiratory tract protection

Should a worker be exposed to a concentration of respirable dust exceeding the exposure limit, use suitable respiratory protective equipment commensurate with the level of dust and conforming to the relevant EN standards (e.g., a filter facepiece certified pursuant to UNI EN 149).

The personal protective equipment defined in relation to the localized controls and evaluated for a DNEL value = 1 mg/m^3, are listed in the following table.

Table 8.2.2

Exposure scenario	PROC (*)	Exposure	Specific respiratory protection equipment (RPE)	RPE efficiency – Assigned Protection Factor (APF)
Industrial production/ Formulation of hydraulic materials for building and construction	2, 3	Duration not limited (up to 480 minutes per shift, 5 shift per week)	Not required	--
	14, 26		A) Mask P2 (FF, FM) or B) Mask P1 (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		Mask P2 (FF, FM)	APF = 10
Industrial uses of dry hydraulic materials for building and construction (indoors and outdoors)	2		Not required	--
	14, 22, 26		A) Mask P2 (FF, FM) or B) Mask P1 (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		Mask P2 (FF, FM)	APF = 10
Industrial uses of wet suspension of hydraulic materials for building and construction	7		A) Mask P3 (FF, FM) or B) Mask P2 (FF, FM)	APF = 20 APF = 10
	2, 5, 8b, 9, 10, 13, 14		Not required	--
Professional uses of hydraulic materials for building and construction (indoors and outdoors)	2		A) Mask P2 (FF, FM) or B) Mask P1 (FF, FM)	APF = 10 APF = 4
	9, 26		A) Mask P3 (FF, FM) or B) Mask P2 (FF, FM)	APF = 20 APF = 10
	5, 8a, 8b, 14		Mask P3 (FF, FM)	APF = 20
	19 (#)		Mask P3 (FF, FM)	APF = 20
Professional uses of wet suspensions of hydraulic materials for building and construction	11	(#) < 240 min	A) Mask P3 (FF, FM) or B) Mask P2 (FF, FM)	APF = 20 APF = 10
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		Not required	--

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

An example of the assigned protection factors (APF) for different respiratory protective equipment

(RPE), pursuant to standard EN 529:2005, can be found in the glossary of MEASE methodology *[see References (17)].*

Thermal risks

Not applicable.

8.2.3 Environmental exposure controls

See the engineering control measures to prevent dispersion of the mixture dust into the environment.

Adopt measures to ensure that the mixture does not reach water (sewers or ground or surface water).

At facilities where the mixture is handled, transported, loaded, unloaded and stored, suitable measures must be taken to contain the dispersion of dust in the workplace (see also paragraphs 8.2.1 and 15.1).

In particular, preventive measures must ensure the containment of the concentration of respirable particulate below the time weighted threshold level (TLV-TWA), adopted by the Association of American Environmental Hygienists (ACGIH) for Portland cement.

Likewise, all required technical and organisational measures must be adopted to prevent the dispersion and accidental spillage of dust from the mixture at different stages of production and use, mainly to avoid its drainage into soil, water courses or sewers.

The environmental impact and the potential danger to organisms/aquatic ecosystems are related to the increase of pH due to the formation of hydroxides; on the other hand, ecotoxicity resulting from other inorganic components (ions) is negligible compared to the negative effect of pH.

In any case, any negative effects related to the production and use cycle of the mixture has a localized impact at the site; the pH level of surface water and wastewater should not be above 9.

Otherwise, the pH level could have a negative effect on municipal water treatment plants (STPs) and industrial wastewater treatment plants (WWTPs).

For this evaluation, it is appropriate to adopt a systematic approach in order to:

- Level 1: collect information on the pH level of the waste and the contribution of spilled dust from the mixture to any change; if the pH value is predominantly higher than 9 due to dust from the mixture, it will be necessary to take appropriate preventive measures.
- Level 2: collect information on the pH level of the receiving water after the entry point of the discharge; the pH value must not be higher than 9.
- Level 3: sample and measure the pH level of the receiving body of water, after the entry point of the discharge. If the pH is below 9, it is reasonable to assume the absence of any negative effect, while if the pH is above 9, action must be taken to neutralise the waste, in order to avoid any environmental impact from dispersion of dust from the mixture, at different stages of production and use.

On the other hand, specific preventive measures are not required for spillage on the ground, apart from the proper application of normal, effective management practices.

For additional details, see Section 6.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance: it is a solid inorganic material in powder form
b) Color: gray or white powder
c) Odor: odorless
d) Melting point/freezing point: > 1000 ° C

e) Boiling point or initial boiling point and boiling range: Not applicable since, under normal atmospheric conditions, the melting point is > 1000 ° C

f) Flammability (solid, gas): Not applicable since it is a non-combustible solid and does not cause or contribute to ignition from friction

g) Upper/lower explosivity limits: Not applicable since it is not a flammable gas

h) Flash point: Not applicable since it is not a liquid

i) Auto-ignition temperature: Not applicable (no pyrophoricity – no metal-organic, organo-metalloid or phosphino-organic bonds or their derivatives, and no other pyrophoric constituent in the composition)

j) Decomposition temperature: Not applicable since there is no organic peroxide present

k) pH: (T = 20 ° C in water, water-solid ratio 1:2): 10-13

l) Kinematic viscosity: Not applicable since it is not a liquid

m) Solubility in water (T = 20 ° C): light (0.1-1.5 g/l)

n) Partition coefficient: n-octanol/water: Not applicable since it is an inorganic mixture

o) Vapor pressure: Not applicable since the melting point is > 1000 ° C

p) Density and/or relative density: 2.5-3.1; apparent density: 0.8-1.5 g/cm^3

q) Relative vapor density: Not applicable since the melting point is > 1000 ° C

r) Characteristics of the particles: 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 characteristics

Not applicable

Section 10. STABILITY AND REACTIVITY

10.1 Reactivity

When mixed with water, the mixture hardens and forms a stable mass that does not react with the environment.

10.2 Chemical stability

The mixture as such is stable as long as it is stored in an appropriate manner (see Section 7); it must be kept dry, avoiding contact with incompatible materials.

Integrity of the package and compliance with the storage conditions described in paragraph 7.2, are essential to maintain the effectiveness of the reducing agent for the period of time specified on the bag or in the delivery note.

The wet mixture is alkaline and incompatible with acids, ammonium salts, aluminium and other non-noble metals; it decomposes in hydrofluoric acid to produce silicon tetrafluoride, a corrosive gas..

Moreover, the mixture reacts with water to form silicates and calcium hydroxide; these silicates react with powerful oxidants such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride and oxygen difluoride.

10.3 Possible hazardous reactions

The mixture does not generate hazardous reactions.

10.4 Conditions to avoid

The presence of moisture during storage, may result in the loss of quality of the product and the formation of lumps (or blocks), thus resulting in difficult handling.

10.5 Incompatible materials

Contact with acids, ammonium salts, aluminium or other non-noble metals can cause exothermic reactions (temperature rise). Furthermore, contact of aluminium powder with the wet mixture causes the formation of hydrogen.

10.6 Hazardous decomposition products

The mixture does not decompose into hazardous products.

Section 11. TOXICOLOGICAL INFORMATION

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

Risk class	Cat.	Effect	Bibliography
Acute toxicity - dermal	-	Limit test in vivo and in vitro in animals (rabbit, contact 24 hours, 2 g per kg body weight) - non-lethal. Based on the available data, the classification criteria are not met.	(2)
Acute toxicity – inhalation	-	No acute inhalation toxicity 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. No acute inhalation toxicity observed. Based on available data, the classification criteria are not met.	from bibliographic review
Corrosion/ skin irritation	2	Cement in contact with moist skin may cause thickening, cracking and fissures of the skin. Prolonged contact in combination with existing abrasion can cause severe burns.	(2) actual experience
Serious eye damage/irritation	1	Clinker caused heterogeneous effects on the cornea and the irritation index level was equal to 128. Cements contain varying amounts of clinker and secondary components, such as gypsum, blast furnace slag, fly ash, limestone and natural pozzolans. Direct contact with cement may cause corneal injury by mechanical stress, immediate or delayed irritation or inflammation. Direct contact with large amounts of dry cement or wet concrete projections can cause effects ranging from moderate irritation eye (e.g., conjunctivitis or blepharitis) to chemical burns and blindness.	(10), (11)
Skin sensitization	1B	Some people may develop eczema as a result of exposure to dust from wet cement, caused either by high pH, which induces irritant dermatitis after prolonged contact, either by an immunological reaction to soluble Cr (VI) that causes allergic dermatitis contact. The response may appear in a variety of forms, from a mild skin rash to severe dermatitis and is a combination of the two mechanisms referred to above. No sensitisation effect is expected if the cement contains a reducing agent of soluble chromium VI, until after expiry of the period of time indicated for the maintenance of the efficacy of the reducing agent [refer to References (3)].	(3), (4), (17)
Respiratory tract sensitization	-	There are no indications of sensitisation of the respiratory tract. Based on the available data, the classification criteria are not met.	(1)
Mutagenicity of embryonic cells (germ)	-	No indications. Based on the available data, the classification criteria are not met.	(12), (13)
Carcinogenicity	-	No causal association has been established between exposure to Portland cement and cancer. Epidemiological literature does not support the identification of Portland cement as a suspected human carcinogen.	(1)

		Portland cement is not classifiable as a human carcinogen (pursuant to ACGIH A4: agents that cause concern about the possibility of being carcinogenic to humans, but that cannot be definitively assessed due to lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent under one of the other headings). Based on the available data, the classification criteria are not met.	(14)
Reproductive toxicity	-	Based on the available data, the classification criteria are not met.	no human trials
STOT – single exposure	3	Cement dust can irritate the throat and respiratory tract; coughing, sneezing and shortness of breath may occur following exposure in excess of the occupational exposure limits. Overall, the evidence gathered 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 alterations in the respiratory tract. There were no chronic effects or effects at low concentration. Based on available data, the classification criteria are not met.	(15)
Risk of aspiration	-	Not applicable, since cement is not used in spray form.	

Except for skin sensitization, Portland cement clinker and common cements (just like the mixture) have the same toxicological and eco-toxicological properties.

- **Medical conditions aggravated by exposure**

  Prolonged inhalation of respirable dust of the mixture may aggravate existing respiratory illnesses and/or disfunctions such as emphysema or asthma and/or pre-existing diseases if the skin and/or eyes.

11.2 Information on other hazards

None

11.2.1 Endocrine disrupting properties

Not applicable

11.2.2 Other information

Not applicable

Section 12. ECOLOGICAL INFORMATION

12.1 Toxicity

The mixture is not hazardous to the environment.

Ecotoxicity tests with Portland cement on Daphnia magna [Reference (5)] and Selenastrum coli [Reference (6)] have shown minor toxicological impact. Therefore, the LC50 and EC50 values could not be determined [Reference (7)].

There are no indications of sediment phase toxicity [Reference (8)].

In the case of large amounts of the mixture in water, under certain circumstances there may be possible effects of ecotoxicity to aquatic life due to the consequent increase in pH.

12.2 Persistence and degradability

Not relevant, since the mixture is an inorganic material; after hardening, there is no risk of toxicity.

12.3 Bioaccumulation potential

Not relevant, since the mixture is an inorganic material; after hardening, there is no risk of toxicity.

12.4 Mobility in soil

Not relevant, since the mixture is an inorganic material; after hardening, there is no risk of toxicity.

12.5 Results of PBT and vPvB evaluation

Not relevant, since the mixture is an inorganic material; after hardening, there is no risk of toxicity.

12.6 Endocrine system disrupting properties

Not relevant.

12.7 Other adverse effects

Not relevant.

Section 13. DISPOSAL CONSIDERATIONS

The mixture and any packaging intended for disposal must be managed according to the provisions of Part IV “Rules for waste management” of Legislative Decree 152/2006 “Environmental Regulations” as amended and its implementing decrees.

13.1 Waste treatment methods

Do not dispose in sewers or waterways.

Product - The mixture beyond its expiry date

When it is shown to contain 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 as amended or treated again with a reducing agent).

Product – unused residue or dry spillage

Collect unused dry residue or dry spills as they are. If necessary, reuse according to shelf-life considerations and the requirement to avoid exposure to dust. In case of disposal, manage in compliance with Legislative Decree 152/2006, as amended.

Product – sludge

Allow to harden, avoid entry into sewer and drainage systems or bodies of water (e.g., streams), and dispose of as explained below in "Product - after the addition of water, hardened".

Product – after the addition of water, hardened

Dispose of according to Legislative Decree 152/2006, as amended. Avoid entry into the sewer system.

Packaging

Empty the packaging and manage it in compliance with current regulations. Assignment of the EER code must be carried out in accordance with the Guidelines adopted pursuant to art. 184, comma 4 of Legislative Decree 152/2006, as amended.

Section 14. TRANSPORT INFORMATION

The mixture is not governed by international regulations for the transport of hazardous goods: IMDG (sea), ADR (road), RID (rail), IATA (air), and therefore no classification is required. No special precautions are necessary expect for those mentioned in Section 8.
During transport, prevent dispersal caused by the wind by using closed containers.

14.1 UN number or ID number

Not relevant.

14.2 UN proper shipping name

Not relevant.

14.3 Transport hazard classes

Not relevant.

14.4 Packing group

Not relevant.

14.5 Environmental hazards

Not relevant.

14.6 Special precautions for users

Not relevant.

14.7 Bulk transport by sea according to IMO instruments

Not relevant.

Section 15. REGULATORY INFORMATION

15.1 Health, safety and environmental standards and laws specific for the mixture

- (EC) Regulation 1907/2006 concerning the registration, evaluation, authorization and restriction of chemicals (REACH) as amended.
- (EC) Regulation 1272/2008 on the classification, labelling and packaging of substances and mixtures, with modification and repeal of Directives 67/548/EEC and 1999/45/EC and of Regulation 1907/2006/EC (CLP) as amended.
- Legislative Decree 81 date 9 April 2008 as amended “Implementation of article 1 of Law no. 123 of 3 August 2007 regarding the protection of health and safety in the workplace”.
- EN 196/10 - “Test methods for concrete – Part 10: Determination of soluble chromium VI in cement”
- EN 197/1 – “Cement - Composition, specifications and conformity criteria for common cements”
- EN 15368 Hydraulic binder for non-structural applications - Definition, specifications and conformity criteria
- EN 413-1 Masonry cement - Pare 1: Composition, specifications and conformity criteria
- EN 14216 Cement - Composition, specifications and conformity criteria for special cements at heat for hydration
- Legislative Decree 152/2006 “Environmental regulations” as amended

- Directive 2004/37/EC as amended on the protection of workers from the risks related to exposure to carcinogens and mutagens at work

- Decree of the Ministry of Health 10/05/2004 “Implementation of Directive 2003/53/EC on the twenty-sixth amendment to Directive 76/769/EEC of 27/07/1976, relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate, in **cement**)”

- Decree of the Ministry of Health 17/02/2005 “Adoption of a test method relating to cements, in reference to Ministerial Decree DM 10/05/2004, which implemented the twenty-sixth amendment of Directive 76/769/EEC”

- Regulation 2020/1677/EU amending Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the classification, labelling and packaging of substances and mixtures in order to improve the workability of information requirements related to emergency health response

- Legislative Decree no. 44 of 1 June 2020 “Implementation of (EU) Directive 2017/2398 of the European Parliament and of the Council of 12 December, which amends Directive 2004/37/EC of the Council on the protection of workers from risks related to exposure to carcinogens or mutagens at work.
  Decree no. 47 of 9 August 2021 approving “Guidelines on waste classification” referred to the resolution of the Council of the National System for Environmental Protection no. 105 of 18 May 2021, 105, as envisaged by art. 184, comma 5 of Legislative Decree no. 152 of 2006, as amended by Legislative Decree no. 116 of 2020.

The so-called “**Good practice guide**”, which provides practical information on proper handling and use of **respirable crystalline silica** and products containing it, is available on the website http://www.nepsi.eu/good-practice-guide.aspx.

These engineering and operational arrangements were implemented as part of the Social Dialogue "*Agreement on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it*" signed on 4/25/2006 between employers and workers' representatives from various industries at the European level, including Cement Companies.

In this context, depending on the specific formulation of the mixture (cf. silica components and the possible content of respirable crystalline silica) and the methods of use, it is appropriate to implement appropriate technical-organizational measures and systematic monitoring of occupational exposure, keeping in mind that the limit value (TLV-TWA), adopted for work environments by the American Industrial Hygienists Association (ACGIH) for "respirable crystalline silica" is 0.025 mg/m3, referring to the respirable fraction, while for Legislative Decree no. 44 of June 1, 2020 transposition of Directive (EU) 2017/2398, the limit is 0.1 mg/m3 in work involving exposure to respirable crystalline silica dust generated by a processing process.

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

Regulation 1907/2006/EC concerning the registration, evaluation, authorization and restriction of chemicals (“REACH”), **on page 47 of Annex XVII**, as amended by **Regulation 552/2009/CE**, lays out the prohibition to market and sell cement and mixtures if they contain, when mixed with water, more than 0.0002% (2 ppm) of soluble chromium VI of the total dry weight of the mixture.

Compliance with this threshold is ensured, if necessary, by adding a reducing agent, the effectiveness of which is guaranteed for a predefined time period and with the constant observance of suitable conditions (described in paragraphs 7.2 and 10.2)).

Pursuant to this Regulation, use of the reducing agent requires communication of the following information:

DATE OF PACKAGING	Indicated on the bag or in the delivery note
STORAGE CONDITIONS	in special closed containers, in a cool and dry place with no ventilation, with a guarantee of maintaining the intactness of the package
STORAGE PERIOD *(*)*	as indicted on the delivery note (for bagged or bulk product) and on each individual bag

(*) *To maintain the effectiveness of the reducing agent.*

The expiry only applies to the effectiveness of the reducing agent in relation to Chromium VI salts, without prejudice to the limits of use indicated in the general rules of storage and use of the product itself.

- Requirements of Regulation 1907/2006/

Cement and cement mixtures, according to the "REACH" Regulations, are a mixture and, as such, are not subject to registration, which instead concerns substances.

Portland cement clinker is a substance (*classifiable as a UVCB inorganic substance*) exempt from registration according to art. 2.7 (b) and Annex V.10 of REACH, under which the European Agency ECHA has also been notified with the necessary information to make an inventory for classification and labelling (C&L) pursuant to art. 40 of EC Regulation 1272/2008 "CLP" *(see notification no. 02-2119682167-31-0000 dated 15/12/2010 and update dated 1/07/2013 with the presentation of Report QJ420702-40.*

However, if certain substances used in the production of the mixture were subject to registration, the present Safety Data Sheet will be updated appropriately based on the information provided by the Registrant and, in particular, if it is found that the data on descriptions of use, exposure scenarios, classification, etc. could have a negative impact on a prior risk assessment.

- Requirements of US EPA TSCA and DSL/WHMIS (Canada) regulations.

The mixture may contain substances on both the US TSCA "*Toxic Substances Control Act*" list, as well as in the Canadian DSL "*Domestic Substance List*" and, being classified as hazardous (see the directions in Section 2) must be labeled and provided with SDS that also complies with the requirements of the Canadian standard WHMIS "*Workplace Hazardous Materials Information System".*

15.2 Chemical safety assessment

No chemical safety assessment was carried out.

Section 16. OTHER INFORMATION

16.1 Indications of changes

This Safety Data Sheet was subjected to revision in application of (EU) Regulation 2020/878 which amends Annex II of (EC) Regulation 1907/2006 of the European Parliament and of the Council concerning the registration, evaluation, authorization and restriction of chemicals (REACH) and to take into account the update of the reference standards concerning Personal Protective Equipment.

Revision 2 also took into account the regulations of the U.S. and Canada concerning the marketing of substances and mixtures.

16.2 Abbreviations and acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ADR /RID	European Agreements on the transport of Dangerous goods by Road/Railway
APF	Assigned protection factor
CAS	Chemical Abstracts Service
EU	European Community
CLP	Classification, labelling and packaging (EC Regulation 1272/2008)
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
ECHA	European Chemicals Agency
EINECS	European INventory of Existing Commercial chemical Substances
ERC	Environmental release category
ES	Exposure Scenario
FFP	Filtering Facepiece against Particles
FMP	Filtering Mask against Particles with filter cartridge

IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods
IMO	International Maritime Organization
IMSBC	International Maritime Solid Bulk Cargoes
LC50	Median lethal
LD50	Lethal Dose
MEASE	Metal Estimation and Assessment of Substance Exposure
MS	Member State
NOEL	No Observed Effect Level
OELV	Occupational Exposure Limit Value
PBT	Persistent, bio-accumulative and toxic (
PC	Product category
PNEC	Predicted no-effect concentration
PPE	Personal protective equipment
PROC	Process category
REACH	Registration, Evaluation and Authorization of Chemicals (EC Regulation 2006)
RPE	Respiratory protective equipment
SCOEL	Scientific Committee on Occupational Exposure Limit Values
SDS	Safety Data
e-SDS	Extended Safety Data Sheet (Safety Data Sheet with exposure scenario)
SE	Single exposure
STP	Sewage treatment plant (
STOT	Specific Target Organ Toxicity
SU	Sector of use
TLV-TWA	Threshold Limit Value - Time-Weighted Average
UFI	Unique Formula Identifier
UVCB	Substance of Unknown or Variable composition, Complex reaction products or biological materials
VLE	Exposure limit value
vPvB	Very persistent, very Bio-accumulative
w/w	Weight by weight
WWTP	Wastewater treatment plant

16.3 References and sources of main information

(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*, 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (October 2002).

(6) U.S. EPA, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (October 2002).

(7) *Environmental Impact of Construction and Repair Materials on Surface and Ground Waters.*

Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D.C. (2001).

(8) *Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker* prepared for Norcem A.S. by AnalyCen Ecotox. AS (2007).

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

(10) TNO report V8815/09, *Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test* (April 2010).

(11) TNO report V8815/10, *Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test* (April 2010).

(12) *Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages*, Van Berlo et al, Chem. Res. Toxicol., (September 2009); 22(9):1548-58.

(13) *Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro*; Gminski et al, Abstract DGPT - Conference Mainz (2008).

(14) *Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement*, Patrick A. Hessel and John F. Gamble, EpiLung Consulting (June 2008).

(15) 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 GmbH 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 Additional information

The table below lists the classification and procedures used to obtain the classification of the mixture pursuant to EC Regulation 1272/2008 “CLP”:

Classification pursuant to (EC) Regulation 1272/2008		Classification procedure
Skin irritation 2	H315	On the basis of test data
Skin sensitization 1B	H317	Actual experience
Eye injuries 1	H318	On the basis of test data
STOT SE 3	H335	Actual experience

The data and test methods used to classify cements and cementitious mixtures can be found in Section 11.1.

16.5 Hazard Statements and Safety advice in force (Respiratory or skin sensitization Serious eye injury/serious eye irritation STOT-single exposure)

See Section 2

16.6 Training tips

In addition to training programs on the environment, health and safety for its own workers, the user company must ensure that workers read, understand and apply the requirements of this Safety Data Sheet.

16.7 Additional information – Methods

See exposure scenario no. 9.1

16.8 Disclaimer

The information contained in this Safety Data Sheet, updated in accordance with current legal provisions, reflects the current knowledge available and when it is safe to predict that the product is used according to the above conditions and in accordance with the directions on the packaging and/or the relevant technical literature.

For any other use of the product, including in combination with other products or in other processes, responsibility rests with the user.

It is assumed that the User is also responsible for the safety measures specifically identified and for the application of suitable operating procedures concerning the prevention of risks at work, in accordance with current legislation.

Emergency contacts – Poison Control Centers

	CAV - Hospital	City	Address – Zip Code	Telephone *
1	Hospital - Universitaria “Ospedali Riuniti”	Foggia	Viale Luigi Pinto 1 - 71122	800183459
2	Hospital "A. Cardarelli"	Naples	Via A. Cardarelli 9 - 80131	081-5453333
3	University Hospital "Umberto I"	Rome	Viale del Policlinico 155 - 00161	06 49978000
4	Po University Hospital "A. Gemelli"	Rome	Largo Agostino Gemelli 8 - 00168	06 3054343
5	Hospital - Universitaria "Careggi" - Tossicologia Medica	Florence	Largo Brambilla 3 - 50134	055 7947819
6	Centro Nazionale di Informazione Tossicologica (National Center for Toxicological Information) IRCCS Fondazione S. Maugeri, Clinica del Lavoro	Pavia	Via Salvatore Maugeri 10 - 27100	0382 24444
7	Hospital “Niguarda Ca' Granda”	Milan	P.za Ospedale Maggiore 3 - 20162	02 66101029
8	Hospital “Papa Giovanni XXII” – Clinical Toxicology	Bergamo	Piazza OMS 1 - 24127	800 883300
9	Pediatric Hospital “Bambino Gesù” DEA Acceptance and Emergency Ward e Accettazione DEA	Rome	Piazza Sant’Onofrio 4 - 00165	06 68593726
10	Verona Integrated Hospital	Verona	Piazzale Aristide Stefani 1 - 37126	800011858

* from abroad: +39 xxx xxxxxx

This Safety Data Sheet, as well as any subsequent revisions, is available in digital form on the company website: www.buzziunicem.it/schede-sicurezza