

# SAFETY DATA SHEET

## “PREMISCELATO®”

Issue date: 1/06/2007

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### Section 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

**1.1 Product identifier:** “Premiscelato®” *(hereinafter referred to as mixture)*  
 Trade name: see item 16.5

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

The Premiscelato is mixed with water and used as both finishing and smoothing plaster in building applications and as mortar for walls and paving blocks.

PROC	Process categories - Identified uses	Producer/ Formulation	Professional/ Industrial use in building materials
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 spray application		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 (*) in small containers (dedicated filling line, weighing included))	X	X
10	Roller or brush application		X
11	Non-industrial spray application		X
13	Treatment of articles through dipping and pouring		X
14	Production of preparations (*) or of articles by tableting, compression, extrusion, pelletisation	X	X
19	Mixing with intimate contact, with the only use of personal protective equipment (PPE)		X
26	Handling of solid inorganic substances at ambient temperatures	X	X

(\*) NB: To maintain consistency with the descriptor system indicated in IUCLID 5.2, in the table the term "preparation" has not been substituted with the new definition of "mixture".

#### 1.3 Details of the supplier of the safety data sheet (SDS)

**BUZZI UNICEM S.p.A.**  
 Via Luigi Buzzi, 6  
 15033 Casale Monferrato (AL)  
 tel. 0142 416411  
 e-mail of manager issuing SDS: [reach@buzziunicem.it](mailto:reach@buzziunicem.it)

**1.4 Emergency telephone number:** 0382 24444 - Pavia Poison Centre *(see also item 16.7)*  
 Available outside office hours?  YES 24 hours a day

## Section 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

*According to (EC) Regulation 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 sensitisation	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

*According to Regulation (EC) No. 1272/2008 (CLP)*



#### Warnings

**Danger**

#### **Hazard statements**

- H318:** causes serious damage to eyes
- H315:** causes skin irritation
- H317:** may cause an allergic skin reaction
- H335:** can 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+P312:** IN CASE OF CONTACT WITH EYES: rinse with water for several minutes. Remove contact lenses, if it can be done easily; continue flushing; If you feel unwell, contact a POISON CENTER or a doctor.
- P302+P352+P333+P313:** IN CASE OF CONTACT WITH SKIN: wash with plenty of soap and water; in case of skin irritation or rash, consult a doctor.
- P261+P304+P340+P312:** Avoid breathing in the dust. IN CASE OF INHALATION: Remove victim to fresh air and keep still in a position comfortable for breathing. If you feel unwell, contact a POISON CENTER or a doctor.
- P501:** Dispose of the product/container in compliance with regulations in force.

## 2.3 Other hazards

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

Repeated inhalation of the powder mixture, for a long period of time, increases the risk of the onset of lung diseases.

Some special formulations may contain a percentage of free crystalline silica, which requires the implementation of suitable technical-organisational measures and the systematic monitoring of occupational exposure *(for additional information, see item 15.1)*.

Repeated and prolonged contact between the mixture and/or its paste on wet skin (due to perspiration or humidity) may cause irritation and/or dermatitis *[Reference (4)]*.

In case of prolonged contact with the skin, both the mixture and its paste can cause sensitisation and/or allergic reaction in some individuals, due to the presence of traces of Chromium VI salts; if necessary, this effect can be mitigated by adding a specific reducing agent to keep the content of soluble chromium VI in concentrations of less than 0.0002% (2 ppm) of the total dry weight, in compliance with the regulatory provisions referred to in item 15.1 *[Reference (3)]*.

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

Under normal conditions of use, the mixture and its paste do not present any particular risks for the environment, save for compliance with the recommendations provided in items 6, 8, 12 and 13 below.

The mixture does not meet the criteria for PBT or vPvB, pursuant to Annex XIII of Regulation 1907/2006/EC, known as "REACH".

## Section 3. COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1 Substance

Not applicable.

### 3.2 Mixtures

#### 3.2.1 Components presenting a health hazard

"Premiscelato" is an inorganic product, consisting of a finely ground mixture of solid materials, such as limestone and/or silica sands, cement and/or hydraulic binders, calcium oxide or hydroxide (<6%), with the addition of additives made of cellulose; therefore, the qualitative-quantitative formulation of the various components varies depending on the specific performance characteristics (cf. workability, setting time, compression and flexural strengths, etc.).

Common cements conforming to the requirements of standard EN 197-1 "*Composition, specifications and conformity criteria for common cements*" as amended, masonry cements (MC) conforming to the requirements of standard UNI EN 413-1 "*Masonry cement - Part 1: Composition, specifications and conformity criteria*", and cements with very low heat (VLH) of hydration conforming to standard UNI EN 14216 "*Cement - Composition, specifications and conformity criteria for special cements at heat for hydration*" are used, as well as hydraulic binders for non-structural applications (HB) conforming to standard UNI EN 15368 "*Hydraulic binder for non-structural applications - Definition, specifications and compliance*"; and hydraulic binders made of sulphoaluminate cement.

The cement and/or the hydraulic binder are an inorganic product, consisting of a finely ground mixture of clinker, gypsum and other specific constituents (limestone, pozzolan, blast-furnace slag, fly ash, etc.), defined by specific technical standards.

Constituent	% by weight	EC number	CAS	"REACH" Registration no.	Classification according to Regulation 1272/2008/EC		
					Hazard Class	Hazard Category	Hazard Indication
Portland cement clinker	5÷100	266-043-4	65997-15-1	Free from (*)	Skin irritation Skin sensitisation Eye damage STOT SE	2 1B 1 3	H315 H317 H318 H335
Flue dust [filters dusts – CKD and by-pass – BPD]	0.1÷5	270-659-9	68475-76-3	01-2119486767-17-0018 (10/11/2010)	Skin irritation Skin sensitisation Eye damage STOT SE	2 1B 1 3	H315 H317 H318 H335
Calcium hydroxide - Calcium (di)hydroxide [Ca(OH) <sub>2</sub> ]	0.1÷6	215-137-3	1305-62-0	01-2119475151-45-0xxx (26/11/2010)	Skin irritation Eye damage STOT SE	2 1 3	H315 H318 H335
Calcium oxide [CaO]	0.1÷6	215-138-9	1305-78-8	01-2119475325-36-0xxx (26/11/2010)	Skin irritation Eye damage STOT SE	2 1 3	H315 H318 H335

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

The "Premiscelato" products is made of Portland cements, limestone ad/or hydraulic binders, with a clinker content which, on average, exceeds 50%; the dusts of the CKD and/or BPD filters (known as flue dust), if used in the cement formulation, are dosed as a secondary constituent.

In the mixture formulation, depending on the intended application, components (substances and/or mixtures) such as pozzolan, blast-furnace slag, fly ash, chemical gypsums, etc.) can be used, as well as setting regulator additives, reducing agents and natural-origin sand, whose toxicological characteristics and risk levels, in any case also depending on the quantitative level, are the same as or inferior to those of clinker.

## Section 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

#### **General notes**

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

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

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

If worn, remove contact lenses. Tilt the head in the direction of the injured eye, open your eyelids and rinse immediately with plenty of water for at least 20 minutes to remove all debris; if possible, use isotonic water (0.9% NaCl).

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

#### **Following skin contact**

For dry mixture, remove and rinse thoroughly with plenty of water.

For wet and/or humid mixture, wash the affected area with neutral pH soap and water or with a suitable mild detergent; moreover, remove contaminated clothing, shoes, eyeglasses, watches, etc. and

thoroughly clean them before wearing them again. Consult a physician in all cases of irritation or burns.

#### **Following inhalation**

Move the person to fresh air; dust in throat and nasal passages should be eliminated naturally. Contact a physician if irritation persists, or if it develops later, or if you experience discomfort, coughing or other symptoms persist.

#### **Following ingestion**

Do not induce vomiting. If the person is conscious, rinse their mouth with water; consult a physician or contact an Anti-poison Centre.

### **4.2. Most important 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 with the skin by the mixture when moist and/or its moist preparations (mortars, plasters, etc.) may cause irritation, dermatitis or burns.  
*[for more details, see References (1)]*

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

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

**Environment:** under normal use conditions, the mixture is not hazardous to the environment.

### **4.3. Indications for any immediate medical attention and special treatment**

See the instructions given in item 4.1; should you need to consult a doctor, bring this 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 may be used.

### **5.2 Special hazards arising from the substance or mixture**

The mixture is not combustible or explosive, nor does it facilitate or contribute to the combustion of other materials.

### **5.3 Advice for fire-fighters**

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

## **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 safe use and handling provided in Section 7.

#### **6.1.2 For emergency responders**

No specific emergency procedures are required. In any event, in the presence of high levels of dust, eye, skin and respiratory tract protection is necessary.

## 6.2 Environmental precautions

Avoid discharge or dispersion of the mixture into ditches and/or drains and/or waterways.

## 6.3 Methods and materials for containment and clean up

### 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 dust by moistening the material and then collecting it using a broom or brush. If this is not possible, wash the mixture with water (see: wet mixture)

Make sure workers wear appropriate 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/cover any water reservoirs that 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

See sections 8 and 13 for additional details.

# Section 7. HANDLING AND STORAGE

## 7.1 Precautions for safe handling

### 7.1.1 Protective measures

Follow the recommendations given in Section 8.

To remove the dry mix, see item 6.3.

#### ***Fire prevention measures***

No precautions are necessary, since the mixture is neither combustible or flammable.

#### ***Measures to prevent the formation of spray or dust***

Do not sweep or use compressed air on the material. Use dry cleaning systems (e.g., vacuum cleaners or vacuum extractors), that do not cause dust to scatter into the air.

In addition, follow the recommendations given in item 15.1 "Guide to good practices".

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

During handling of the mixture, avoiding any dispersal into the environment (also see item 6.2)

### 7.1.2 General information on health and safety in the workplace

It is forbidden to drink or eat in workplaces where the mixture is handled and/or stored.

In dusty environments, always wear anti-dust masks and safety goggles.

Use protective gloves to avoid contact with the skin.

## 7.2 Conditions for safe storage, including any 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 in order to preserve its technical characteristics, avoiding, in any event, any dispersal of dust (see Section 10).

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

To prevent the risk of engulfment or suffocation (during maintenance work and cleaning and/or unclogging operations) do not access confined spaces – e.g., silos, hoppers, or other vehicles used

for transport in bulk or other containers that store or contain a mixture – without following specific safety procedures and without using suitable personal protective equipment.

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

### 7.3 Specific end use

No additional information (also see item 1.2).

### 7.4 Effectiveness of the reducing agent for soluble chromium VI

The intactness of the package and compliance with the aforementioned storage conditions are necessary in order to guarantee the continuous effectiveness of the reducing agent for the time period given on the delivery note or on each bag.

This expiry date relates exclusively to the effectiveness of the reducing agent in maintaining the level of water-soluble chromium VI, established according to standard EN 196-10, below the limit of 0.0002% of the total dry weight of the mixture ready to be used, set by the legislation in force (see item 15.1), without prejudice to the limits of use dictated by the general rules pertaining to product storage and utilisation.

## Section 8. EXPOSURE CONTROL - PERSONAL PROTECTION

### 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<sup>3</sup> (respirable fraction). [\[for additional information, also see item 15.1\]](#)

As regards the quantification of the **exposure level** (DNEL = derived no-effect level):

- DNEL (respirable fraction): 1 mg/m<sup>3</sup>
- 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, an additional precautionary condition is implicitly correlated to the procedure for assessing the risk of occupational exposure.

As regards workers, there are no data or studies or human testing for defining the DNEL limit for skin exposure; moreover, since dust from the mixture is classified as being irritating to skin and eyes, use appropriate protective measures to avoid contact.

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

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

The risk assessment for ecosystems is based on the pH impact on water resources; in any event, the pH of surface water, water courses or in systems carrying water to purification plants should not exceed a value of 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 an option, it must also be selected in Table 8.2.2 of Section 8.2.2 "*Individual protection measures, such as personal protective equipment - Specifications for respiratory protective equipment*"; therefore, the only possible combinations are between (A)-(A) and (B)-(B).

#### 8.2.1 Appropriate engineering controls

In systems used to handle, transport, load, unload and store the mixture, suitable health and safety measures must be taken for the protection of workers and to contain dispersion of the dust in the workplace, as shown in the table [\(evaluated for DNEL = 1 mg per m<sup>3</sup>\)](#).

**Table 8.2.1**

Exposure scenario	PROC (*)	Exposure	Local controls (**)	Efficiency
Industrial manufacturing / formulation of hydraulic materials for building and construction	2. 3	Duration not limited  (up to 480 minutes per shift, 5 shifts per week)	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 (interior and exterior)	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 humid 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 (interior and exterior)	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 (#)		Localised controls are not applicable. The processes can only be carried out in well-ventilated premises 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 item 1.2.

(\*\*) Local controls must be defined according to the actual situation at the plant and, consequently, the individual devices for respiratory protection will be identified as shown in the table in Section 8.2.2.

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

**General:** Do not eat, drink or smoke while handling the mixture, to avoid contact of the cement 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 below; immediately after handling the mixture or products and preparations containing it, wash with mild soap or suitable mild detergent or apply a moisturiser.

#### Eyes/face protection



Wear safety glasses or masks certified according to UNI EN 166 when handling the mixture, to prevent any contact with the eyes.

#### Skin protection



Use tight gloves which are resistant to abrasion and alkalis, certified according to UNI EN 374, parts 1, 2 and 3, as well as safety boots and work clothes (with

long sleeves and legs), as well as skin care products (including moisturisers) to ensure maximum protection in cases of prolonged contact of the skin with the wet mix.

### Respiratory protection



If a worker is exposed to a concentration of respirable dust above the exposure limit, use appropriate respiratory protective equipment commensurate with the level of dust and comply with the relevant technical standards (e.g., a filter face mask certified according to UNI EN 149).

The personal protective equipment, defined in relation to local controls and determined for a value  $DNEL = 1 \text{ mg/m}^3$ , is listed in the following table.

**Table 8.2.2**

Exposure scenario	PROC (*)	Exposure	Specific equipment for respiratory protection (RPE)	RPE efficiency – Assigned Protection Factor (APF)
Industrial manufacture or formulation of hydraulic materials for building and construction	2, 3	Duration not limited  (up to 480 minutes per shift, 5 shifts per week)	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 materials for building and construction (interior and exterior)	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 materials for building and construction	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 hydraulic materials for building and construction (interior and exterior)	2		A) P2 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 10 APF = 4
	9, 26		A) P3 mask (FF, FM) or B) P2 mask (FF, FM)	APF = 20 APF = 10
	5, 8a, 8b, 14		P3 mask (FF, FM)	APF = 20
	19 (#)		P3 mask (FF, FM)	APF = 20
Professional uses of wet suspensions of hydraulic materials for the building and construction	11	A) P3 mask (FF, FM) or B) P3 mask (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 explanation 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

In systems for handling, transporting, loading, unloading and storing the mixture, suitable health and safety measures must be taken to contain dispersion of the dust in the workplace (see also items 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 operation, mainly to avoid it draining into soil, watercourses or sewers.

The environmental impact and the potential danger to organisms and aquatic ecosystems are related to pH increase 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 the pH.

In any case, any negative effects, related to the cycle of production and of use of the mixture, have a localised impact at the site; the pH level of surface water and waste water should not exceed 9.

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

For this assessment, it is advisable to adopt a systematic approach, as described below:

- Level 1: collect information on the pH content of the waste and on how the spilt mixture dust contributes to its change; if the pH value is higher than 9 due to the predominant contribution of the mixture dust, appropriate preventive measures need to be adopted.
- Level 2: collect information on the pH level of the receiving water after the entry point of the discharge; the pH value must not exceed 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 powders from the mixture, at different stages of production and use.

Specific preventive measures are not required for spillage on the ground, apart from the proper application of ordinary and effective management practices.

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

- (a) Appearance: solid inorganic powder (main particle size 5÷30 µm)
- (b) Odour: odourless
- (c) Odour threshold: no threshold, odourless
- (d) pH (T = 20°C in water, water-solid ratio 1:2): 11 ÷ 13.5
- (e) Melting point: Ca(OH)<sub>2</sub> dehydrates into CaO at 580 °C
- (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 limit: Not applicable as it is not a flammable gas.
- (k) Vapour pressure: not applicable.
- (l) Vapour density: not applicable.
- (m) Relative density: 2.0 ÷ 2.2 g/cm<sup>3</sup>  
Apparent density: 0.6 ÷ 1.2 g/cm<sup>3</sup>
- (n) Solubility in water (T = 20 °C): low (0.1 ÷ 1.5 g/l)
- (o) Partition coefficient: n-octanol/water: not applicable as it is inorganic substance.
- (p) Auto-ignition temperature: not applicable (no pyrophoricity – no organo-metallic, organo-

metalloid or organo-phosphine bonds or of their derivatives, and no other pyrophoric constituents in the composition).

- (q) Decomposition temperature: Not applicable, as it contains no organic peroxide.
- (r) Viscosity: Not applicable, as it is not a liquid.
- (s) Explosive properties: Not applicable; not explosive or pyrotechnic;  
It is not capable, by itself, of producing, by means of chemical reactions, at temperatures, pressures and speeds such as to cause damage to the environment, or of self-sustaining exothermic chemical reactions.
- (t) Oxidising properties: Not applicable as it does not cause or contribute to the combustion of other materials.

## 9.2 Other information

Not applicable.

## Section 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

When mixed with water, the mixture hardens to form a stable mass that does not react with the environment. The dry mixture is chemically stable and compatible with the majority of other construction materials.

### 10.2 Chemical stability

The mixture is permanently stable as long as it is stored properly (see Section 7); it must be kept dry, avoiding contact with incompatible materials.

Intactness of the package and compliance with the storage conditions indicated in item 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 into hydrofluoric acid to produce silicon tetrafluoride, a corrosive gas.

Furthermore, 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 Possibility of hazardous reactions

Not applicable, as the mixture generates no 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), with consequent difficulty in 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 any hazardous products.

## Section 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

Hazard class	Cat.	Effect	Reference
Acute toxicity - dermal	-	Limit test in vivo and in vitro in animals (rabbit, contact 24 hours, 2 g per kg body weight) - non-lethal. Based on 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. Based on available data, the classification criteria are not met.	Literature survey
Skin corrosion/irritation	2	Cement in contact with moist skin may cause thickening, cracking and fissures of the skin. Prolonged contact in combination with existing abrasions can cause severe burns.	(2) Human experience
Serious eye damage/irritation	1	Clinker caused heterogeneous effects on the cornea and the irritation index level was 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 sensitisation	1B	Some individuals 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 following 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 Reference (3)].	(3), (4), (16)
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. Epidemiological literature does not support the identification of Portland cement as a suspected human carcinogen. Portland cement is not classifiable as a human carcinogen (pursuant 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 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	-	There is an indication of COPD (chronic obstructive pulmonary disease). The effects are acute and due to high exposures. 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, because the cement is not used in spray form.	

NB.: Apart from skin sensitisation, Portland cement and clinker (*as well as the mixture*) have the same toxicological and eco-toxicological properties.

- **Medical conditions aggravated by exposure**

Prolonged exposure to high concentrations of respirable dust mixture may aggravate existing respiratory disorders and/or dysfunctions such as emphysema or asthma and/or pre-existing diseases of the skin and/or eyes.

## Section 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 on *Selenastrum coli* [Reference (6)] have shown little toxicological impact. Therefore, the LC50 and EC50 values could not be determined [Reference (7)].

There is no indication of sediment phase toxicity [Reference (8)].

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

### 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 assessment

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

### 12.6 Other adverse effects

Not relevant.

## Section 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

The mixture and its paste, if destined for disposal, must be managed in accordance with the provisions of Legislative Decree 152 of 03 April 2006 - Part IV "*Rules for Waste Management*", as amended and with its implementing decrees.

The mixture and its paste, classified as non-hazardous waste, carry no particular disposal risks, as long as care is taken to avoid discharge or leakage into waterways or sewers.

Empty bags and packing must also be handled in accordance with current legislation on non-hazardous waste.

## Section 14. TRANSPORT INFORMATION

The mixture does not fall within any class of hazard for the transport of dangerous goods and, therefore, it is not subject to the relevant regulations: IMDG (sea), ADR (road), RID (rail), ICAO / IATA (air).

During transport, prevent wind dispersal by placing the mixture in closed containers.

**14.1 UN number**

Not relevant.

**14.2 UN proper shipping name**

Not relevant.

**14.3 Transport hazard class**

Not relevant.

**14.4 Packing group**

Not relevant.

**14.5 Environmental hazards**

Not relevant.

**14.6 Special precautions for users**

Not relevant.

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IMSBC Code**

Application of the provisions of the IMSBC Code for the maritime transport of cargo in bulk (see Appendix C), adopted by the International Maritime Organisation (IMO) with Resolution MSC 268 (85): 2008, as subsequently amended, and implemented in Italy by Decree 1340 of 30/11/2010 of the Italian Ministry of Infrastructures and Transport Decree.

## Section 15. REGULATORY INFORMATION

**15.1 Safety, health and environmental laws and regulations specific to the substance or mixture**

- **EC Regulation 1907 of 18 December 2006**  
*"Registration, Evaluation, Authorisation and Restriction of Chemicals" (REACH)*
- **EC Regulation 987 of 9 October 2008**  
*"Amendment to Regulation 1907/2006/EC, regarding the exclusions defined in Annexes IV and V"*
- **Corrigendum to EC Commission Regulation 987/2008 – 8 October 2008**  
*"Amendment to Annexes IV and V of Regulation 1907/2006/EC"*
- **EC Regulation 552 of 22 June 2009**  
*"Amendment to European Parliament and Council Regulation 1907/2006/EC regarding Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), regarding Annex XVII "Restrictions on the manufacture, marketing and use of certain substances and preparations".*
- **EC Regulation 1272 of 16 December 2008**  
*"Classification, labelling and packaging of substances and mixtures, and modification And repeal of Directive 67/548/EEC and 1999/45/EC and Regulation 1907/2006/EC"*
- **EU Regulation 830 of 28 May 2015**  
*"Amendment to Regulation 1907/2006/EC, Annex II on "Requirements for the compilation of Safety Data Sheets (SDS)"*
- **EU Regulation 487 of 8 May 2013**  
*"Amendment, for the purpose of adapting it to technical and scientific progress, to Regulation (EC) 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures "*
- **Decree of the Italian Ministry of Health of 10 May 2004**  
*"Implementation of Directive 2003/53/EC on the twenty-sixth amendment to Directive 76/769/EEC of 27 July 1976 relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate, in **cement**)"*

- **Decree of the Italian Ministry of Health of 17 February 2005**  
*"Adoption of a test method relating to cements, in reference to Italian Ministerial Decree 10/05/2004, which implemented the twenty-sixth amendment of Directive 76/769/EEC"*
- **Italian Legislative Decree 156 of 03 April 2006, as subsequently amended**  
*"Environmental Regulations" (known as TUA)*
- **EN 197-1** *"Cement - Composition, specifications and conformity criteria for common cements"*
- **UNI EN 15368** *"Hydraulic binder for non-structural applications - Definition, specifications and compliance criteria"*
- **UNI EN 413-1** *"Masonry cement - Part 1: Composition, specifications and conformity criteria"*
- **UNI EN 14216** *"Cement - Composition, specifications and conformity criteria for special cements at heat for hydration"*
- **EN 196-10** *"Test methods for concrete - Part 10: Determination of soluble chromium VI in cement"*
- **Italian Legislative Decree 81 of 9 April 2008, as subsequently amended**  
*"Regarding the protection of health and safety in the workplace"*

The user of the mixture must apply the technical and organisational measures required by the aforementioned Legislative Decree and the relevant implementing Decrees, also taking into account information on exposure controls and the provision of appropriate PPE in Section 8.

- The so-called "**Guide to good practices**", which contains advice on the proper handling and use of **free crystalline silica** and of the products that contain it, is available at <http://www.nepsi.eu/good-practice-guide.aspx>.

These plant engineering and operational methods have been implemented within the scope of the Social Dialogue "*Agreement on the worker health protection through proper handling and use of crystalline silica and products that contain it*", entered into on 25/04/2006 between employers and worker representative of various industrial sectors at the industrial level, including cement manufacturers.

In this context, in relation to the specific formulation of the mixture (cf. to the silica components and to the content, if any, of respirable crystalline silica) and the methods of use, it is advisable to implement suitable technical-organisational measures and the systematic monitoring of occupational exposure, keeping in mind that the limit value (TLV-TWA), adopted for work environments by the American Conference of Industrial Hygienists (ACGIH) for "free crystalline silica" is equal to 0.025 mg/m<sup>3</sup>, referred to the respirable fraction.

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

**Regulation 1907/2006/EC** concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH"), **on page 47, Annex XVII**, as amended by **Regulation 552/2009/EC** prohibits the marketing and use of cement and mixtures if they contain, when hydrated, more than 0.0002% (2 ppm) soluble chromium VI of the total dry weight of the mixture itself.

Compliance with this threshold is ensured, if necessary, by addition of a reducing agent, the effectiveness of which is guaranteed for a predetermined time period and with the constant observance of the appropriate storage conditions (described in items 7.2 and 10.2).

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

<b>PACKAGING DATE</b>	Specified on bag or delivery note
<b>STORAGE CONDITIONS</b>	in special closed containers, cool, dry and with no ventilation, with a guarantee of maintaining the intactness of the pack
<b>STORAGE PERIOD (*)</b>	as reported on the delivery note (for product bagged or in bulk) and on each individual bag

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

The expiry only applies to the reducing agent's efficiency in relation to Chromium VI salts, under the limits of use in the product's general rules of conservation and use.

#### - Requirements of Regulation 1907/2006/EC "REACH"

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

Portland cement clinker is a substance (*classified as an inorganic UVCB substance*) exempt from registration under Article 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) under Article 40 of EC Regulation 1272/2008 "CLP" (*see notice 02-2119682167-31-0000 dated 15/12/2010 and update of 07/01/2013 with presentation of Report QJ420702-40*).

As regards the dusts of the (CKD) and by-pass (BP) filters, known as "Flue dust", the Annex contains the use descriptors of the substance (cf. the Chemical Safety Report), related to the identified uses and, in particular, the exposure scenario related to normal use during the production cycle of hydraulic binders (*ref. e-SDS*):

Exposure scenario	Sector of Use SU	Product Category PC	Process category PROC	Environmental Release Category ERC
9.1 Industrial manufacture of hydraulic materials for building and construction	Not applicable	0, 9a, 9b	2, 3, 5, 8b, 9, 14, 26	2

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 adversely impact a prior risk assessment.

#### 15.2 Chemical Safety Assessment

No chemical safety assessment was carried out for this mixture.

### Section 16. OTHER INFORMATION

#### 16.1 Indications of changes

This safety data sheet has been subjected to comprehensive revision to incorporate the provisions introduced by EC Regulation 1272/2008 "CLP" on classification, labelling and packaging of substances and mixtures and Annex II of EU Regulation 453/2013 (**see SDS**), **in force from 1 June 2015**.

#### 16.2 Abbreviations and acronyms

ACGIH	American Conference of Governmental Industrial Hygienists
ADR /RID	European Agreements on the transport of Dangerous goods by Road/Railway
APF	Assigned protection factor
CAS	Chemical Abstracts Service
CE	European Community
CLP	Classification, labelling and packaging ( <a href="#">EC Regulation 1272/2008</a> )
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Commercial chemical Substances
ERC	Environmental release category
ES	Exposure Scenario
FFP	Filtering Facepiece against Particles
FMP	Filtering Mask against Particles with filter cartridge
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods

IMO	International Maritime Organization
IMSBC	International Maritime Solid Bulk Cargoes
LC50	Median lethal dose ( <a href="#">lethal concentration at 50%</a> )
LD50	Lethal Dose ( <a href="#">lethal dose at 50%</a> )
MEASE	Metal Estimation and Assessment of Substance Exposure
MS	Member State
NOEL	No Observed Effect Level
OELV	Occupational Exposure Limit Value
PBT	Persistent, bio-accumulative and toxic
PC	Product category
PNEC	Predicted no-effect concentration
PPE	Personal protective equipment
PROC	Process category
REACH	Registration, Evaluation and Authorisation of Chemicals ( <a href="#">EC Regulation 1907/2006</a> )
RPE	Respiratory protective equipment
SCOEL	Scientific Committee on Occupational Exposure Limit Values
SDS	Safety Data Sheet
e-SDS	Extended Safety Data Sheet
SE	Single exposure
STP	Sewage treatment plant
STOT	Specific Target Organ Toxicity
SU	Sector of use
TLV-TWA	Threshold Limit Value - Time-Weighted Average
UVCB	Substance of Unknown or Variable composition, Complex reaction products or Biological materials
VLE	Exposure limit value
vPvB	Very persistent, very Bio-accumulative
w/w	Weight by weight
WWTP	Waste water treatment plant

### 16.3 References and sources of 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](http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf)
- (4) *Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr (VI) in cement*, NIOH (page 11, 2003)
- (5) U.S. EPA, *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (October 2002).
- (6) U.S. EPA, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (October 2002).
- (7) *Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development*. NCHRP report 448, National Academy Press, Washington, D.C. (2001).

- (8) *Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox. AS (2007).*
- (9) TNO report V8801/02, *An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats* (August 2010).
- (10) TNO report V8815/09, *Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test* (April 2010).
- (11) TNO report V8815/10, *Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test* (April 2010).
- (12) *Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages*, Van Berlo et al, Chem. Res. Toxicol., (September 2009); 22(9):1548-58.
- (13) *Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro*; Gminski et al, Abstract DGPT - Conference Mainz (2008).
- (14) *Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement*, Patrick A. Hessel and John F. Gamble, EpiLung Consulting (June 2008).
- (15) *Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010*, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway (March 2010).
- (16) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo (December 2011).
- (17) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php>

#### 16.4 Training advice

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

#### 16.5 Further information

The **main trade names** of “Premiscelati” products are:

- **PRONTAPRESA**
- **ECO T**
- **ROCKET**
- **ECOSPRITZ GUNITE**
- **CENUPREM**

The data and test methods, used for the classification of cements and cement mixtures, are provided in Section 11.1.

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

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

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

- For additional info, please contact: **BUZZI UNICEM S.p.A.**  
**Research Centre**  
 00012 Guidonia (RM) tel. 0774.385450  
 fax 0774.343228

## 16.6 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 its use 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 the application of appropriate operating procedures concerning the prevention of risks at work, in accordance with current legislation.

## 16.7 Emergency contacts – Italian Poison Control Centres

	Poison Control Centre - Hospital	City	Address - Post code	Telephone *
1	"Ospedali Riuniti" University Hospital	Foggia	Viale Luigi Pinto, 1 - 71122	0881 732326
2	"A. Cardarelli" Hospital	Naples	Via A. Cardarelli, 9 - 80131	081 7472870
3	"Umberto I" University Hospital	Rome	Viale del Policlinico, 155 - 00161	06 49978000
4	"A. Gemelli" University Hospital	Rome	Largo Agostino Gemelli, 8 - 00168	06 3054343
5	"Careggi" University Hospital - Medical Toxicology	Florence	Largo Brambilla, 3 - 50134	055 7947819
6	National Centre for Toxicological Information, IRCCS Fondazione S. Maugeri, Occupational Clinic	Pavia	Via Salvatore Maugeri, 10 - 27100	0382 24444
7	"Niguarda Ca' Granda" Hospital	Milan	P.za Ospedale Maggiore, 3 - 20162	02 66101029
8	"Papa Giovanni XXII" Hospital – Clinical toxicology	Bergamo	Piazza OMS, n. 1 - 24127	800 883300
9	"Bambino Gesù" Paediatric Hospital	Rome	Piazza Sant'Onofrio, 4 - 00165	06 68593726

\* when calling from abroad: +39 xxx xxxxxx

**FILTERS (CKD) AND BY-PASS (BPD) DUSTS  
EXPOSURE SCENARIO**

**Exposure scenario no. 9.1:**
**Industrial manufacture of hydraulic building and construction materials**

<b>Exposure scenario concerning uses carried out by workers</b>	
<b>1. Title: Industrial manufacture of hydraulic building and construction materials</b>	
Title	Manufacture of mixtures containing Flue Dust: cement, hydraulic binder, controller low strength material, concrete (ready mixed or precast), mortar, grout and others for building and construction work.
Sector of use	Not applicable
Market sectors	PC 0: Building and construction products PC 9b: Fillers, putties, plasters, modelling clay PC 9a: Coatings and paints, thinners and fillers, pickling solutions
Environmental scenario	ERC 2: Formulation of preparations
Worker scenario	PROC 2: Use in closed continuous process, with occasional controlled exposure PROC 3: Use in closed batch process (synthesis or formulation) PROC 5: Mixing or blending in batch process for formulation of preparations and articles (multi-stage and/or significant contact) PROC 8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC 14: Production of preparations or articles by tableting, compression, extrusion, pelletisation PROC 26: Handling of solid inorganic substances at ambient temperature
Assessment methods	The assessment of inhalation exposure is based on the dustiness / volatility of the substance, using the exposure estimation tool MEASE The environmental assessment is based on a qualitative approach, described in the introduction. Relevant parameter is the pH in water and soil.
<b>2. Operational conditions and risk management measures</b>	
<b>2.1 Control of workers exposure</b>	
<b>Product characteristics</b>	
<p>Hydraulic building and construction materials are inorganic binders. Generally, these products are mixtures of Portland cement clinker and other hydraulic and non-hydraulic constituents.</p> <p>Flue dust can be a component of common cements, i.e., Portland cement; in this main utilisation case, <b>the content of flue dust is less than 5%</b>.</p> <p>In other hydraulic binders, the content of flue dust may be higher than 50%; generally speaking, the content in a hydraulic mixture is not restricted. Flue dust is a highly dusty substance.</p> <p>In all end uses, the substances will intentionally come into contact with water. In part, the substance reacts with water and forms hydration products. At this stage of a wet or pasty suspension, the product is irritating, due to the pH, which is a 11. On the other hand, the final product hardens (i.e., mortar, concrete) and is no longer irritating, since no free alkaline moisture remains.</p>	
<b>Amounts used</b>	
It is believed that the actual quantity/year handled during each single work shift does not influence the workers' exposure scenario. Instead, the combination of the type of operation (industrial vs. professional) and the level of containment and/or automation of the systems (as reported in the PROC) represents the main determinant of the intrinsic dust emission potential of the process.	
<b>Frequency and duration of use/exposure</b>	
Processes	Duration of exposure
PROC 2, 3, 5, 8b, 9, 14, 26 (all)	Not restricted (480 minutes)

Human factors not influenced by risk management				
The respirable volume per shift, during all process steps reported in the PROCs is presumed to be equal to 10 m <sup>3</sup> /turno (8 hours).				
Other indicated operational conditions that affect workers exposure				
Operational conditions, like process temperature and process pressure, are not considered relevant for occupational exposure assessment of the conducted processes.				
Technical conditions and measures at process level (source) to prevent release				
Risk management measures at the process level are generally not required in the process.				
Technical conditions and measures to control dispersion from source towards the worker				
Processes	Localised controls (LC)	LC efficiency (according to MEASE)	Other information	
PROC 2, 3	General ventilation	17 %	-	
PROC 5, 8b, 9, 14, 26	General local ventilation	78 %	-	
Organisational measures to prevent/limit releases, dispersion and exposure				
Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating and smoking at the workplace, the wearing of standard working clothes and shoes unless otherwise stated below. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home. Do not use compressed air to remove dust.				
Conditions and measures related to personal protection, hygiene and health				
Processes	Specification of Respiratory Protective Equipment (RPE)	RPE efficiency – Assigned Protection Factor (APF)	Specification of gloves	Additional personal protective equipment (PPE)
PROC 2, 3	Not required	Not applicable	Waterproof, abrasion and alkali resistant gloves, internally lined with cotton.  The use of gloves is mandatory, since flue dust is classified as irritating to skin.	Safety goggles or visors (according to UNI EN 166) are mandatory, since flue dust is classified as highly irritating to eyes.  Additional face protection, protective clothing and safety shoes are required to be work as appropriate.
PROC 5, 8b, 9	FF P2 mask	APF = 10		
PROC 14.26	FF P1 mask	APF = 4		
Gloves and eye protective equipment must be worn, unless potential contact with the skin and eyes can be excluded by the nature and type of application (i.e., closed process). An overview of the assigned protection factors (APF) of different respiratory protective equipment (RPE), according to EN 529:2005, can be found in the glossary of the MEASE method. Any RPE as defined above shall only be worn if the following preventive measures are implemented in parallel: the duration of the work activity (compared to the "duration of exposure" referred to above) should take into account the additional psychological stress for the worker due to breathing resistance and mass of the RPE itself, due to the increase in thermal stress (cf. to the head). Moreover, it must be considered that the worker's operational capability (cf. use of tools and efficacy of the communication) will be reduced as a result of wearing the RPE. For the reasons given above, the worker should therefore be: (i) healthy (especially in view of medical problems that may affect the use of RPE); (ii) have suitable facial characteristics that reduce leakages between face and the filtering mask (in view of scars and hair). The devices recommended above, which rely on perfect face seal, will not provide the required protection unless they fit the contours of the face properly and securely. The employer and any self-employed workers are responsible for both distributing personal protective devices and for managing their proper use in the workplace, and for carrying out periodical checks and maintenance. Therefore, they should also define and document suitable worker information and training initiatives on proper use of personal protection equipment.				
2.2 Control of environmental exposure				
Product characteristics				
Hydraulic building and construction materials are inorganic binders. Generally, these products are mixtures of Portland cement clinker and other hydraulic or non-hydraulic constituents.				

<p>Flue dust can be a component of common cements, i.e., Portland cement; in this main utilisation case, <b>the content of flue dust is less than 5%</b>.</p> <p>In other hydraulic binders, the content of flue dust may be higher than 50%; generally speaking, the content in a hydraulic mixture is not restricted. Flue dust is a highly dusty substance.</p> <p>In all end uses, the substances will intentionally come into contact with water. In part, the substance reacts with water and forms hydration products. At this stage of a wet or pasty suspension, the product is irritating, due to the pH, which is a 11. On the other hand, the final product hardens (i.e., mortar, concrete) and is no longer irritating, since no free alkaline moisture remains.</p>										
<p><b>Amounts used</b></p> <p>The daily and annual quantity used per site (cf. at the precise source of emission in an industrial environment) is not considered a decisive factor for influencing the environmental exposure scenario.</p>										
<p><b>Frequency and duration of use</b></p> <p>Intermittent use/release (used &lt; 12 times / year for less than 24 consecutive hours) or continuous use/release.</p>										
<p><b>Environmental factors not influenced by risk management</b></p> <p>Flow rate of receiving surface water: 18,000 m<sup>3</sup>/g</p>										
<p><b>Other indicated operational conditions affecting environmental exposure</b></p> <p>Effluent discharge rate: 2,000 m<sup>3</sup>/g</p>										
<p><b>Conditions and technical measures <i>in situ</i> for reducing or limiting discharges, emissions into the air and releases into the ground</b></p> <p>Risk management measures related to the environment aim to avoid discharging suspensions containing Flue Dust into municipal wastewater or to surface water. In this case, the discharge is expected to cause significant changes in the pH; therefore, regular monitoring of the pH content is required following introduction into open waters. Usually, discharges should be carried out in such a way as to minimise pH changes in the receiving surface waters (e.g., through neutralisation). In general, most aquatic organisms can tolerate pH values in the range of 6-9; this value is also reported in the description of standard OECD tests with aquatic organisms.</p>										
<p><b>Organisational measures to prevent/limit release from site</b></p> <p>Workers training, based on the Safety Data Sheet (SDS).</p>										
<p><b>Conditions and measures related to municipal sewage treatment plant</b></p> <p>The pH of the wastewater going into the municipal sewage treatment plant has to be controlled on a regular basis and neutralised if necessary.</p> <p>Solid flue dust constituents must be separated from the sewage effluent.</p>										
<p><b>Conditions and measures related to waste disposal</b></p> <p>Solid industrial waste containing flue dust should be reused or discharged after hardening and/or neutralisation.</p>										
<p><b>3 Exposure estimation</b></p>										
<p><b>3.1 Occupational exposure (health)</b></p> <p>The exposure estimation tool MEASE was used for the assessment of inhalation exposure.</p> <p>The risk characterisation ratio (RCR) is the quotient of the detected exposure estimate and the respective DNEL (this value must be less than 1 to demonstrate a safe use).</p> <p>For inhalation exposure, the RCR is based on the DNEL = 1 mg/m<sup>3</sup> (as <u>respirable dust</u>) and on the respective inhalation exposure estimate obtained using MEASE (as <u>inhalable dust</u>).</p> <p>In this way, the RCR value includes an additional safety margin since the respirable fraction is a sub-fraction of the inhalable fraction, according to UNI EN 481.</p>										
<table border="1"> <thead> <tr> <th>Processes</th> <th>Method used for inhalation exposure assessment</th> <th>Inhalation exposure estimate (RCR)</th> <th>Method used for dermal exposure assessment</th> <th>Dermal exposure estimate (RCR)</th> </tr> </thead> <tbody> <tr> <td>PROC 2, 3, 5, 8b, 9, 14, 26</td> <td>MEASE</td> <td>&lt; 1 mg/m<sup>3</sup> (0.44 – 0.83)</td> <td>Since Flue Dust is classified as irritating to skin and eyes, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Therefore, dermal exposure is not assessed in this exposure scenario.</td> <td></td> </tr> </tbody> </table>	Processes	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)	PROC 2, 3, 5, 8b, 9, 14, 26	MEASE	< 1 mg/m <sup>3</sup> (0.44 – 0.83)	Since Flue Dust is classified as irritating to skin and eyes, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Therefore, dermal exposure is not assessed in this exposure scenario.	
Processes	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)						
PROC 2, 3, 5, 8b, 9, 14, 26	MEASE	< 1 mg/m <sup>3</sup> (0.44 – 0.83)	Since Flue Dust is classified as irritating to skin and eyes, dermal exposure has to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Therefore, dermal exposure is not assessed in this exposure scenario.							
<p><b>3.2 Emissions into the environment</b></p> <p>Significant emissions or exposure to air are not expected due to the low vapour pressure of Flue Dust.</p>										

<p>Specific preventive measures are not required for spillage on the ground, apart from the proper application of ordinary and effective management practices; thus, these emissions are not considered relevant for this exposure scenario.</p> <p>The environmental exposure assessment is only relevant for the aquatic environment as emissions of Flue Dust. The environmental impact and the potential danger to organisms and aquatic ecosystems are related to pH increase 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 the pH.</p> <p>In any case, any negative effects, related to the cycle of production and of use of the flue dust, have a localised impact at the site; in fact, the pH level may have a negative effect on municipal sewage treatment plants (STPs) and on industrial waste water treatment plants (WWTPs). A systematic approach is adopted for this assessment, keeping in mind that the pH content of surface water should not exceed 9.</p>	
Emissions into the environment	<p>The production of flue dust can potentially result in aquatic emission; hence, at the local level, the pH and the amounts of the following ions can be increased in the aquatic environment: <math>K^+</math>, <math>Na^+</math>, <math>Ca^{2+}</math>, <math>Mg^{2+}</math>, <math>SO_4^{2-}</math>, <math>Cl^-</math>.</p> <p>When the pH is not neutralised, the effluent of production sites may affect the pH of the receiving water. Generally speaking, the pH of the effluents is periodically sampled and measured, and can be easily neutralised according to the provisions of the national laws in force.</p>
Exposure concentration in waste water treatment plants (WWTPs)	<p>Waste water from systems that produce/use flue dust consist of inorganic compounds, for which no biological treatment is necessary .</p> <p>Normally, this waste water is not treated in biological waste water treatment plants (WWTPs), but can be used to control the pH of acid waste water streams that are treated in biological (WWTPs).</p>
Exposure concentration in aquatic pelagic compartments	<p>When Flue Dust is emitted to surface water the following happens. Some Flue Dust constituents (sulphate and chloride salts, potassium, calcium and magnesium) are highly or moderately soluble and will remain suspended in water.</p> <p>Besides, these salts are naturally present in sea water and in groundwater; the amount in groundwater depends on the geological formation of the soil and varies from region to region.</p> <p>On the other hand, some constituents react with water and form highly insoluble inorganic hydration products.</p> <p>Due to the hydration reaction, the pH of the water may increase, depending on the adsorbent capacity of the water; the higher the adsorbent effect, the lower the effect on the pH will be. In general, the adsorbent capacity suited to prevent shifts in acidity or alkalinity in natural waters is regulated by the balance between carbon dioxide (<math>CO_2</math>), the bicarbonate ion (<math>HCO_3^-</math>) and the carbonate ion (<math>CO_3^{2-}</math>).</p>
Exposure concentration in sediments	<p>A risk assessment for the sediment compartment is considered as not relevant and therefore not included.</p> <p>When Flue Dust is emitted to this compartment the following happens.</p> <p>Some Flue Dust constituents are inert and insoluble (calcite, quartz, clay minerals), they are naturally occurring minerals and will have no impact on the sediment.</p> <p>Some constituents, on the other hand, react with water and form highly insoluble inorganic hydration products; moreover, these products have no bio-accumulation potential.</p> <p>Other constituents are highly soluble and will remain suspended in water .</p>
Exposure concentrations in soil and groundwater	<p>When Flue Dust is emitted to the soil and groundwater compartment, the following happens.</p> <p>Some Flue Dust constituents are inert and insoluble (calcite, quartz, clay minerals); they are naturally occurring minerals and will have no impact on the soil.</p> <p>Some Flue Dust constituents (sulphate and chloride salts from sodium, potassium, calcium and magnesium) are moderately or highly soluble and will remain in groundwater.</p> <p>Besides, these salts are naturally present in sea water and in groundwater; the amount in groundwater depends on the geological formation of the soil and is therefore variable.</p> <p>Some other constituents react with water and form highly insoluble inorganic hydration products.</p> <p>Due to the hydration reaction, the pH of the water may increase, depending on the adsorbent capacity of the water; the higher the adsorbent effect, the lower the effect on the pH will be. In general, the adsorbent capacity suited to prevent shifts in acidity or alkalinity in natural waters is regulated by the balance between carbon dioxide (<math>CO_2</math>), the bicarbonate ion (<math>HCO_3^-</math>) and the carbonate ion (<math>CO_3^{2-}</math>).</p>
Exposure concentration in the atmospheric compartment	<p>A risk assessment for the air compartment is considered as not relevant and therefore it is not included. When Flue Dust particles are emitted to air, they will sediment or be washed out by rain in a reasonably short time. Thus, the atmospheric emissions end up in soil and water.</p>
Exposure concentration relevant for the food chain (secondary poisoning)	<p>A risk assessment for secondary poisoning is not required, because bioaccumulation in organisms is not relevant for Flue Dust, which is an inorganic substance.</p>

#### 4 Guide for end users to evaluate whether they are working inside the boundaries set by the Exposure Scenario

##### Occupational exposure (health)

The end user operates within the boundaries set by the Exposure Scenario if either the proposed risk management measures as described above are implemented or if the end user can unilaterally demonstrate the adequacy and efficacy of its own operational conditions and of the technical-organisational measures adopted for risk management purposes.

This statement must be backed up by the actual guarantee that exposure complies with the limit value defined based on the processes and/or activities identified by the PROCs listed in point 1), with DNEL inhalation equal to 1 mg/m<sup>3</sup> (as respirable dust).

If measured data is not available, the end user can make use of an appropriate methodological tool such as MEASE ([www.ebrc.de/mease.html](http://www.ebrc.de/mease.html)) to estimate the occupational exposure associated with the inhalable fraction.

Important note: The end user must be aware of the fact that, apart from long-term DNEL (indicated above for respirable flue dust), there is also a DNEL for acute effects, with a limit value equal to 4 mg/m<sup>3</sup>.

By demonstrating safe use, based on assessment of the exposure conforming to long-term DNEL level, the acute DNEL is also complied with (According to *Guide R.14, acute exposure levels can be calculated by multiplying the long-term exposure estimates by a factor of 2*).

Please note that, if the MEASE method is used to calculate the exposure estimates (cf. the inhalable fraction), the duration of the exposure should only be reduced to half a work shift, as a risk management measure (leading to a 40 % exposure reduction).

##### Environmental exposure

Per this assessment, it is recommended to adopt a systematic approach:

- Level 1: collect information on the pH content of the waste and on how the spilt mixture dust contributes to its change; if the pH value is higher than 9 due to the predominant contribution of the mixture dust, appropriate preventive measures need to be adopted.
- Level 2: collect information on the pH level of the receiving water after the discharge point; the pH value of the receiving water must not exceed 9.
- Level 3: sample and measure the pH level of the receiving water after the discharge point. If the pH is below 9, it is reasonable to assume the absence of any negative effect; if the pH is above 9, action must be taken to neutralise the waste, in order to avoid any environmental impact from dispersion of powders from the mixture, at different stages of production and use.