SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Mixture name: Cement for general use - cement according to EN 197-1 and ČSN EN 197-1 ed.2

- Portland cement
- Portland slag cement
- Portland-limestone cement
- Portland composite cement
- Portland-fly ash cement
- Blast furnace cement
- Pozzolana cement
- Composite cement

Synonyms:

CEM I 52,5 R, CEM I 42,5 R, CEM I 42,5 R (sc), CEM I 42,5 R (ra), CEM II/A-S 42,5 R, CEM II/A-LL 42,5 R, CEM II/A-LL 32,5 R, CEM II/A-S 52,5 N, CEM II/A-V 42,5 R, CEM II/B-S 32,5 R, CEM II/B-M (S-V) 32,5 R, CEM II/B-M(S-V-LL) 32,5 R, CEM II/A-M (S-V) 42,5 R, CEM II/B-V 42,5 N, CEM III/B 32,5 N – LH/SR, CEM III/A 42,5 N LH, CEM III/A 42,5 R LH, CEM V/A (S-V) 32,5 R, CEM II/A-S 52,5 R

Chemical name and formula:	mixture
Commercial name:	none
CAS:	mixture
EINECS:	mixture
Molar mass:	mixture
REACH registration number:	not registered, mixture
Unique composition identifier:	not available (transitional period for notifying the mixture until 31/12/2024 used)[NN)]

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

Relevant identified uses: Cements are used in industrial installations to manufacture/formulate hydraulic binders for building and construction work, such as ready-mixed concrete, mortars, renders, grouts, plasters as well as precast concrete.

Common cements and cement containing mixtures (hydraulic binders) are used industrially, by professionals as well as by consumers in building and construction work, indoor and outdoor. The identified uses of cements and cement containing mixtures cover the dry products and the products in a wet suspension (paste).

PROC	Identified Uses – Process Categories	Manufacture/formulation	Professional/industrial use
		in building and construction work and building and construction materials	
2	Use in closed, continuous process with occasional controlled exposure (such as sampling)	X	X
3	Use in closed batch process (synthesis or formulation)	X	X
5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	X	X
7	Industrial spraying		X
8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities		X
8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	X	X
9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	X	X
10	Roller application or brushing		X
11	Non industrial spraying		X
13	Treatment of articles by dipping and pouring		X
14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation	X	X
19	Hand-mixing with intimate contact and only PPE available		X
22	Potentially closed processing operations with minerals/metals at elevated temperature		X
26	Handling of solid inorganic substances at ambient temperature	X	X

Uses advised against: No uses are advised against.

1.3 Details of the supplier of the safety data sheet

Name:	Cemex Czech Republic, s.r.o.
Address:	Plzeňská 3217/16, Smíchov, 150 00 Praha 5 Prachovice Plant Tovární 296, 538 04 Prachovice
Telephone:	+420 737 990 718
Fax:	-
E-mail address of person responsible for the SDS in the relevant country or the EU:	jan.konig@cemex.com

1.4 Emergency telephone number

Emergency telephone number (Europe):	112
National poison prevention and treatment centre:	
Occupational Disease Clinic, Toxicological Information Centre Na Bojišti 1, 128 08 PRAGUE 2	224 919 293 24/7 service 224 915 402
Intercompany emergency telephone number:	+420 469 810 444
Available outside office hours:	☒ Yes ☐ No 24/7 From xx to xx

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 According to Regulation (EC) No 1272/2008 (CLP)

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

2.2 Label elements

2.2.1 According to Regulation (EC) No 1272/2008 (CLP)

Hazardous substances: Cement (Portland) clinker, dust from the manufacture of Portland cement clinker

Hazard pictogram:

Signal word: Danger

Hazard statements:

H318 Causes serious eye damage

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H335 May cause respiratory irritation

Precautionary statements:

P102 Keep out of reach of children
P261 Avoid breathing dust
P280 Wear protective gloves, protective clothing, eye protection and/or face protection (for more details see the Safety Data Sheet).
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P501 Dispose of contents/container according to applicable waste and packaging regulations in force.

Supplemental labelling:
Not applicable.

2.3 Other hazards

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

Skin or eye contact with wet cement, fresh concrete or mortar may cause irritation, dermatitis or burns (contact with water results in the formation of a strongly alkaline solution). Its may cause an allergic reaction in some individuals due to the water-soluble Cr(VI) content.

Products made of aluminium and other base metals may be damaged.
The product contains chromate reducing agent. All cement is labelled with the hazard statement H317.
No other hazards are known or expected.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable – mixture.

3.2 Mixtures

Cement / Cement for general use according to EN 197-1 and ČSN EN 197-1 ed.2

Hazardous substances

Constituent	Content (% of mass)	Reg. No.	EINECS	CAS	Classification according to Regulation (EC) No. 1272/2008	
					Hazard class and category	H-phrases
Cement (Portland) clinker	5-100	Not assigned (see Chapter 15.1), exempt from registration	266-043-4	65997-15-1	Eye Dam 1 Skin Sens. 1B Skin Irrit. 2 STOT SE 3	H318 H317 H315 H335
Dust from the manufacture of Portland cement clinker	0.1-5	01-2119486767-17-xxxx	270-659-9	68475-76-3	Eye Dam 1 Skin Sens. 1B Skin Irrit. 2 STOT SE 3	H318 H317 H315 H335
Ferrous sulphate Anhydrite Monohydrate Tetrahydrate Heptahydrate	<1	01-2119513203-57-xxxx	 231-753-5 605-688-1 - 616-510-7	 7720-78-7 17375-41-6 20908-72-9 7782-63-0	Acute Tox. 4 Eye Irrit. 2 Skin Irrit. 2 Skin Sens. 1	H302 H319 H315 H317

Other substances

Constituent	Content (% of mass)	Reg. No.	EINECS	CAS	Classification according to Regulation (EC) No. 1272/2008	
					Hazard class and category	H-phrases
Limestone	According to EN 197-1	Exempt, Annex IV, REACH	215-279-6	1317-65-3	-	-

Blast furnace slag	According to EN 197-1	01-2119487456-25-xxxx	266-002-0	65996-69-2	-	-
Fly ash	According to EN 197-1	01-2119491179-27-xxxx	931-322-8	-	-	-
Calcium sulphate / gypsum	According to EN 197-1	01-2119444918-26-xxxx	7778-18-9	231-900-3	-	-

[Cement components – slag, gypsum, fly ash and limestone – are not subject to classification, not even under Regulation No. 1272/2008][NN)]

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

General notes

No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet cement or wet cement containing mixtures.

Following inhalation

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

Following skin contact

For dry cement, remove and rinse abundantly with water.

For wet cement, wash skin with plenty of water.

Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them. Seek medical treatment in all cases of irritation or burns.

Following contact with eyes

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

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

Following ingestion

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

Protecting first aid responders

Prevent the material from entering eyes and any contact between the damp or wet material and the skin.

4.2 Most important symptoms and effects, both acute and delayed

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

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

Prolonged skin contact with wet cement or wet concrete may cause serious burns because they develop without pain being felt (for example when kneeling in wet concrete even when wearing trousers).

For more details see Reference (1).

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

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

4.3 Indication of any immediate medical attention and special treatment needed

Please follow recommendations in Subsection 4.1. When contacting a physician, take this SDS with you.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing media

5.1.1 Suitable extinguishing media

Suitable extinguishing media: Common cements are not flammable. Use a powder, foam or CO_2 extinguisher to extinguish fire in the surroundings.

Use fire-fighting measures appropriate to the circumstances (given situation) and the surrounding environment.

5.1.2 Unsuitable extinguishing media:

Do not use water on fresh material to avoid any risk of leakage into the sewer. There are no known unsuitable extinguishing media for hardened and matured material.

5.2 Special hazards arising from the substance or mixture

Cements are non-combustible and non-explosive and will not facilitate or sustain the combustion of other materials. There are no known hazardous products of combustion of the product.

5.3 Advice for fire-fighters

Cement poses no fire-related hazards. No need for special protective equipment for fire-fighters. Avoid dust generation. Apply fire-fighting measures appropriate to the circumstances (given situation) and the surrounding environment.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear protective equipment as described under Section 8, prevent contact with skin, eyes and clothing, do not inhale dust, and follow the advice for safe handling and use given under Section 7.

Protect from moisture.

6.1.2 For emergency responders

Emergency procedures are not required.

However, respiratory protection is needed in situations with high dust levels. For further guidance see Subsection 7.1.2.

Avoid contact with skin, eyes and clothing - use appropriate protective equipment (see Section 8).

Avoid dust inhalation - ensure that adequate ventilation and/or suitable respiratory protection equipment is used, wear suitable protective equipment (see Section 8).

Protect from moisture.

6.2 Environmental precautions

Prevent leakage and spread of spillage. Prevent uncontrolled release into streams / bodies of water and sewers (increase in pH). Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

6.3 Methods and material for containment and cleaning up

Collect the spillage in a dry state and re-use unless contaminated or degraded.

Dry cement

Use clean-up methods such as vacuum clean-up or vacuum extraction (industrial portable units equipped with high efficiency air filters (EPA and HEPA filters, EN 1822-1:201909) or equivalent technique) which reduce dust emissions and do not cause airborne dispersion / dusting. Never use compressed air.

Wet cleaning can be also used (water spray, fine mist), prevent dust from becoming airborne, wipe up the dust and remove slurry (see wet cement). Do not use the vacuum or brushes when wet cleaning. Ensure that personal protective equipment is worn and prevent the spread of dust.

When wet cleaning or vacuum cleaning is not possible and only dry cleaning with brushes can be done, ensure that the workers wear the appropriate personal protective equipment and prevent dust from spreading.

Avoid inhalation of cement and contact with skin. Place spilled materials into a container and use it. Solidify before disposal as described under Section 13.

Wet cement

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

6.4 Reference to other sections

See sections 8 and 13 for more information about exposure control / protection of persons and disposal.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Avoid contact with skin and eyes. Use protective equipment (see Section 8 of this Safety Data Sheet). Do not wear contact lenses when handling the product. Keep the dust level to a minimum.

Follow the recommendations as given under Section 8.

To clean up dry cement, see Subsection 6.3.

Measures to prevent fire

Not applicable.

Measures to prevent aerosol and dust generation

Do not sweep. Use dry clean-up methods such as vacuum clean-up or vacuum extraction, which

do not cause airborne dispersion.

For more information, refer to the practice guidelines adopted under the Social Dialogue Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing It by employee and employer European sectoral associations (including CEMBUREAU). Through the above agreement, “good practice guidelines”, also containing safe handling practices, have been adopted (http://www.nepsi.eu/good-practice-guide.aspx).

Environmental precautions

No specific precautions.

7.1.2 Information on general occupational hygiene

Avoid inhalation or ingestion of material and contact with skin and eyes. General hygiene measures at work are required to ensure safe handling of the substance. These precautions include good personal and housekeeping practices (i.e. regular cleaning with appropriate cleaning agents). Do not drink, eat or smoke in the workplace. At the end of the work shift, shower and change clothes.

Do not handle or store near food and beverages or smoking materials.

In dusty environment, wear dust mask, respirator and protective goggles.

Use protective gloves to avoid skin contact.

7.2 Conditions for safe storage of substances and mixtures, including any incompatibilities

Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.

Engulfment hazard: Cement can build up or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly. To prevent engulfment or suffocation, do not enter a confined space, such as a

silo, bin, bulk truck, or other storage container or vessel that stores or contains cement without taking the proper safety measures.

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

Packed products should be stored in original sealed bags in dry conditions and protected from contamination in order to avoid degradation of quality.

Bags should be stored (stacked) in a stable manner.

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

Method and duration of storage - for more information see National Annex (NA) to ČSN EN 197-1 ed.2 NN)

Keep out of the reach of children.

7.3 Specific end use(s)

No additional information for the specific end uses (see Section 1.2).

7.4 Additional information – control of soluble Cr (VI)

For cements treated with a Cr (VI) reducing agent according to the regulations given in Section 15, the effectiveness of the reducing agent diminishes with time. Therefore, cement bags and/or delivery documents will contain information on the packaging date, the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below 0.0002% of the total weight of the cement according to EN 196-10. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

DNEL inhalation (8hrs): 3 mg/m3

DNEL dermal: not applicable

DNEL oral: not relevant

DNEL values refer to respirable dust while exposure estimates for MEASE reflect the respirable (inhalable) fraction. Therefore, an additional safety margin is an inherent part of the risk management assessment and the resulting risk management measures.

No cement-related DNEL for dermal (skin) exposure has been determined for workers, either based on safety studies or human experience. As cements are classified as irritating to the skin and eyes, dermal exposure must be reduced to the the minimum technically feasible level.

PNEC aquatic environment: not applicable

PNEC sediment: not applicable

PNEC soil environment: not applicable

Assessment of exposure to the aquatic environment is based on possible changes in pH. Exposure is determined by assessing the resulting pH impact. The pH value of surface water, groundwater and waste water routed to the WWTP should not exceed 9.

Hygienic limits for the work environment (Government Regulation No. 361/2007 Sb.)[NN]:

The ‘permissible exposure limit’ (PEL) of a chemical substance or dust is the whole-shift time-weighted average concentration of gases, vapours or aerosols in the air in the workplace, to which, according to the current state of knowledge, an employee may be exposed during an eight-hour or shorter shift, which is part of weekly working hours, without suffering, even with lifelong occupational exposure, damage to health or an impact on the employee’s ability to work and performance. The permissible exposure limit is set for work during which the average pulmonary ventilation of the employee does not exceed 20 litres per minute during an eight-hour shift. The concentration of a chemical substance or dust in the air in the workplace, the source of which is not a technological process, must not exceed 1/3 of its permissible exposure limit.

The maximum permissible concentration (MPC) is such a concentration of a chemical substance that employees can be exposed to continuously for a short period of time without experiencing eye or respiratory irritation or facing potential harm to their health and reliability of work performance. When evaluating the air in the workplace, the time-weighted average of the concentration of this substance measured for a maximum of 15 minutes can be compared with the highest permissible concentration. There may only be up to four such 15-minute time periods at least one hour apart during an 8-hour shift with the average concentration exceeding the permissible exposure limit but not exceeding the highest permissible concentration. At the same time, the time-weighted average concentration for the entire shift must not exceed the permissible exposure limit.

PEL for the overall dust (inhalable fraction) concentration is referred to as PEL_C. 'Inhalable dust fraction' means a group of airborne dust particles that may inhaled through the nose or the mouth. (The particle size is 10 – 100 µm for the inhalable fraction and < 10 µm for the respirable fraction.)

Substance	GD No. 361/2007 Coll.		
	PEL_C (mg/m^3)	PEL (mg/m^3)	NPK-P (mg/m^3)
Limestone, calcium carbonate	10	-	-
Cement, dust from the manufacture of Portland cement clinker	10	-	-
Blast furnace slag**	10	-	-
Fly ash	10	-	-
Silicon dioxide, quartz and cristobalit (feldspar)*	The permissible exposure limit for the respirable fraction of dust PEL_r 0.1 mg/m^3 for 100% content of the fibrogenic component in the respirable dust fraction; and for less than 1% crystalline SiO_2 the permissible exposure limit for the total dust concentration (inhalable fraction) PEL_c 10 mg/m^3 in the air in the workplace		

*) volume of respirable SiO_2 in the product under 1% of mass

**) for the respirable fraction (particle size < 5 µm), the manufacturer sets the limit for 4 mg/m^3

Limits according to Directive 2000/39/EC and Decree No. 432/2003 Sb. are not set. NN)

8.2 Exposure controls

For each individual PROC, companies/users can choose from either option (A) or (B) in the table below, according to what is best suited to their specific situation. If one option is chosen, then the same option has to be chosen in the table from Subsection "8.2.2 Individual protection measures such as personal protection equipment" - Specification of respiratory protective equipment. Only combinations between A) – A) and B) – B) are possible.

8.2.1 Appropriate engineering controls

Measures to reduce generation of dust and to avoid dust propagating in the environment such as dedusting, exhaust ventilation and dry clean-up methods which do not cause airborne dispersion.

Use	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		(A) not required or (B) generic local exhaust ventilation	- 78%
	5, 8b, 9		(A) general ventilation or (B) generic local exhaust ventilation	17% 78%
Industrial use of dry hydraulic building	2		not required	-
	14, 22, 26		(A) not required or	-

and construction materials (indoor, outdoor)			(B) generic local exhaust ventilation	78%
	5, 8b, 9		(A) general ventilation or (B) generic local exhaust ventilation	17% 78%
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) not required or (B) generic local exhaust ventilation	- 78%
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	9, 26		(A) not required or (B) generic local exhaust ventilation	- 72%
	5, 8a, 8b, 14		(A) not required or (B) integrated local ventilation	- 87%
	19		Local measures are not applicable, only in well-ventilated rooms or outdoors	50%
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) not required or (B) generic local exhaust ventilation	- 72 %
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

In the Czech Republic: The procedure for monitoring the content of substances in the air in the workplace and the specifications of protective equipment should be determined by the employee responsible for occupational safety and health. Legal entities and natural persons-entrepreneurs are required to take measurements to detect and check the concentration of substances in the air in the workplace and classify workplaces by job category. NN)

8.2.2 Individual protection measures such as personal protection equipment

8.2.2.1 General

During work avoid kneeling in fresh mortar or concrete wherever possible. If kneeling is absolutely necessary then appropriate waterproof personal protective equipment must be worn.

Do not eat, drink or smoke when working with cement to avoid contact with skin or mouth.

Before starting to work with cement, apply a barrier creme and reapply it at regular intervals.

Immediately after working with cement or cement-containing materials, workers should wash or shower or use skin moisturisers.

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

8.2.2.2 Eye/face protection

Do not wear contact lenses. Wear approved glasses or safety goggles according to EN 166 when handling dry or wet

cement to prevent contact with eyes.

8.2.2.3 Skin protection

Use watertight, wear- and alkali-resistant protective gloves (e.g. nitrile gloves made of material with a low content of soluble Cr(VI), CE marking) internally lined with cotton; boots; closed long-sleeved protective clothing as well as skin care products (e.g. barrier creams) to protect the skin from prolonged contact with wet cement. Particular care should be taken to ensure that wet cement does not enter the boots Regarding gloves, investigations have proven that nitrile impregnated cotton gloves (layer thickness of c. 0.15 mm) provide sufficient protection over a period of 480 minutes, subject to normal wear and tear which can be task dependent. Always change damaged or soaked gloves immediately. Always have spare gloves in ready supply. In some circumstances, such as when laying concrete or screed, waterproof trousers and knee pads are necessary.

8.2.2.4 Respiratory protection

When a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection. The type of respiratory protection should be adapted to the dust level and conform to the relevant EN standard (EN 149+A1, EN 140, EN 14387+A1, EN 1827+A1) or national standard.

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	5, 8b, 9		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
Industrial use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	5, 8b, 9		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		P1 mask (FF, FM)	APF = 4
	9, 26		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
	5, 8a, 8b, 14		(A) P3 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 20 APF = 4
	19		P2 mask (FF, FM)	APF = 10
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

[For each PROC, companies can choose from either option (A) or (B) in the table above, according to what is best suited to their specific situation. If one of the options is selected, the same option should be selected in the table in Section "8.2.1 Appropriate engineering controls" – Localised controls].

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

Any RPE as defined above shall only be worn if the following principles are implemented in

parallel: The duration of work (compare with "duration of exposure" above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker's capability of using tools and of communicating are reduced during the wearing of RPE. For reasons as 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 reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely.

The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers.

8.2.2.5 Thermal hazards

Not applicable.

8.2.3 Environmental exposure controls

Environmental exposure control for the emission of cement particles into air has to be in

accordance with the available technology and regulations for the emission of general dust

particles.

Environmental exposure control is relevant to the water environment in the form of emission of cement in various phases of the life cycle (manufacture and use) primarily in relation to underground water and waste water. The effect in the aquatic environment and the risk assessment include the effect on organisms/ecosystems due to a possible pH change (hydroxide dissolution). The toxicity of other dissolved inorganic ions is expected to be negligible compared to the possible effect of pH change. Do not wash cement into sewage systems or into bodies of water to avoid high pH. Above pH 9, negative ecotoxicological impacts are possible.

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

See Act No. 201/2012 Sb., on air protection, and Act No. 254/2001 Sb., on water and amending some laws, as amended.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

(a)-(b) Physical state and colour:	Dry cement is a finely ground solid inorganic material (grey or white powder).
(c) Odour:	Odourless
Odour threshold:	Not applicable
(d) Melting point/freezing point:	> 1250°C
(e) Boiling point or initial boiling point and boiling range:	Not applicable (a solid with melting point >1250°C)
(f) Flammability:	Not applicable as is a solid which is non-combustible and does not cause or contribute to fire through friction
(g) Upper/lower explosive (combustion) limits:	Not flammable, not explosive (free of any chemical structures typically associated with explosive properties), not applicable
(h) Flash point:	Not applicable (a solid with melting point >1250°C), not a liquid
(i) Auto-ignition temperature:	Not applicable (no pyrophoricity – no organo-metallic, organometalloid or organo-phosphine bindings or their derivatives, and no other pyrophoric constituent in the composition)
(j) Decomposition temperature:	Not applicable, as no organic peroxide present
(k) pH:	(T = 20°C in water, water-solid ratio 1:2): 11-13.5
(l) Kinematic viscosity:	Not applicable (a solid with melting point >1250°C), not a liquid
(m) Solubility in water:	slight, 0.1-1.5 g/l, at 20°C
(n) Partition coefficient:	
- n-octanol/water:	Not applicable as it is an inorganic substance.
(o) Vapour pressure:	Not applicable (a solid with melting point >1250°C)
(p) Density and/or relative density:	2.75-3.20; apparent density: 0.9-1.5 g/cm^3
(q) Relative vapour density:	Not applicable (a solid with melting point >1250°C)
(r) Particle characteristics:	Particle size mainly 5-50µm.

9.2 Other information

9.2.1 Information regarding hazard classes

Explosive properties:	Not applicable as it is not an explosive or pyrotechnics, as the substance itself is not capable of creating gas through a chemical reaction at such a temperature and pressure and at such a speed as to cause damage to its surroundings. Not capable of a spontaneous exothermic chemical reaction.
Oxidizing properties:	Not applicable as it does not cause or contribute to the combustion of other materials.

9.2.2 Other safety characteristics

Evaporation rate: Not applicable (a solid with melting point >1250°C), not a liquid

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

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

10.2 Chemical stability

Dry cements are stable as long as they are properly stored (see Section 7) and compatible with most other building materials. They should be kept dry. Contact with incompatible materials should be avoided.

Wet cement is alkaline and incompatible with acids, with ammonium salts, with aluminium or other nonnoble metals. Cement dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas. Cement reacts with water to form silicates and calcium hydroxide. Silicates in cement react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

10.3 Possibility of hazardous reactions

Cements do not cause hazardous reactions.

10.4 Conditions to avoid

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

10.5 Incompatible materials

Acids, ammonium salts, aluminium or other non-noble metals. Uncontrolled use of aluminium powder in wet cement should be avoided as hydrogen is produced.

10.6 Hazardous decomposition products

Cements will not decompose into any hazardous products.

SECTION 11: TOXICOLOGICAL INFORMATION

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

11.1.1 Substances

Not relevant

11.1.2 Mixtures

Hazard class	Cat.	Effect	Reference
Acute toxicity – dermal	-	Limit test, rabbit, 24 hours contact, 2,000 mg/kg body weight – no lethality. Based on available data, the classification criteria are not met.	(2)
Acute toxicity inhalation (gases, vapours, dust and mist)	-	No acute inhalation effects were observed. Based on available data, the classification criteria are not met.	(9)
Acute toxicity - oral	-	No indication of oral toxicity from studies with cement kiln dust. Based on available data, the classification criteria are not met.	Literature survey
Skin corrosion/irritation	2	Cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns.	(2) Human experience
Serious eye damage/irritation	1	Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128. Common cements contain varying quantities of Portland cement clinker, fly ash, blast furnace slag, gypsum, natural pozzolans, burnt shale, silica fume and limestone. Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact by larger amounts of dry cement or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns and blindness.	(10), (11)
Skin sensitisation	1B	Some individuals may develop eczema upon exposure to wet cement dust caused by high pH triggering contact dermatitis due to irritation after prolonged contact or an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis and it is a combination of both mechanisms described above. If the cement contains a soluble Cr (VI) reducing agent and as long as the mentioned period of effectiveness of soluble Cr (VI) is not exceeded, no sensitising effect is expected. [Reference (3)] and phrase H317 are not required (reference (18))	(3), (4), (17) (18)
Respiratory sensitisation	-	There is no indication of sensitisation of the respiratory system. Based on available data, the classification criteria are not met.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met.	(12), (13)
Carcinogenicity	-	No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen. Portland cement is not classifiable as a human carcinogen (According to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of	(1) (14)

Hazard class	Cat.	Effect	Reference
		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.) Portland cement contains up to 5% dust. Based on available data, the classification criteria are not met.	
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience
STOT – single exposure	3	Cement dust may irritate the throat and respiratory tract. Coughing, sneezing, and shortness of breath may occur following exposures in excess of occupational exposure limits. Overall, the pattern of evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, evidence available at the present time is insufficient to establish with any confidence the dose-response relationship for these effects.	(1)
STOT – repeated exposure	-	There is an indication of COPD. The effects are acute and due to high exposures. No chronic effects or effects at low concentration have been observed. Based on available data, the classification criteria are not met.	(15)
Aspiration hazard	-	Not applicable as cements are not used as an aerosol.	

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

Medical conditions aggravated by exposure

Inhaling cement dust can worsen existing respiratory diseases or medical conditions such as emphysema or asthma, or existing skin or eye conditions.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Information on adverse health effects due to endocrine disrupting properties - not relevant, does not contain any.

11.2.2 Other information

Not applicable.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

The product is not hazardous to the environment. Ecotoxicological tests with Portland cement on Daphnia magna [Reference (5)] and Selenastrum coli [Reference (6)] have shown little toxicological

impact. Therefore, LC50 and EC50 values could not be determined [Reference (7)]. There is no indication of sediment phase toxicity [Reference (8)]. The addition of large amounts of cement to water may, however, cause a rise in pH and may, therefore, be toxic to aquatic life (aquatic environment, aquatic organisms) under certain circumstances.

12.2 Persistence and degradability

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

12.3 Bioaccumulative potential

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

12.4 Mobility in soil

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

12.5 Results of PBT and vPvB assessment

The substances in the mixture do not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation (EC) No 1907/2006). Not relevant, cement is an inorganic material. After hardening, cement presents no toxicity risks.

12.6 Endocrine disrupting properties

Not relevant

12.7 Other adverse effects

Not relevant

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Cements can be reused if they are not contaminated or otherwise degraded. Waste treatment methods are not used here.

Do not dispose of into sewage systems or surface waters.

Product *- cement that has exceeded its shelf life*

(and when demonstrated that it contains more than 0.0002% soluble Cr (VI)): shall not be used/sold other than for use in controlled closed and totally automated processes or should be recycled or disposed of according to local legislation or treated again with a reducing agent.)

Product *- unused residue or dry spillage*

Pick up dry unused residue or dry spillage as is. Mark the containers. Possibly reuse depending upon shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to “Product – after addition of water, hardened”.

Product *– slurries*

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

Product *- after addition of water, hardened*

Dispose of according to the local legislation. Avoid entry into the sewage water system. Dispose of the hardened product as concrete waste. Due to its inertisation after hardening, concrete waste is not a dangerous waste.

European Waste Catalogue classification:

10 13 14 Waste concrete and concrete sludge

10 13 99 Wastes not otherwise specified

(10 Wastes from thermal processes, 10 13 Wastes from manufacture of cement, lime and plaster and articles and products made from them)

17 01 01 Concrete

(17 Construction and demolition wastes (including excavated soil from contaminated sites), 17 01 Concrete, bricks, tiles and ceramics)

Empty the container completely and dispose of it in accordance with applicable legislation

European Waste Catalogue classification:

15 01 01 Paper and cardboard packaging

(15 Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified, 15 01 Packaging (including separately collected municipal packaging waste))

SECTION 14: TRANSPORT INFORMATION

Common cements are not covered by the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID), therefore no classification is required.
No special precautions are needed apart from those mentioned under Section 8.

14.1 UN number or ID number

Not relevant

14.2 Official (UN) proper shipping name

Not relevant

14.3 Transport hazard class(es)

Not relevant

14.4 Packing group

Not relevant

14.5 Environmental hazards

Not relevant

14.6 Special precautions for user

Not relevant

14.7 Maritime transport in bulk according to IMO instrument

Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Permit: Not required
Restricted use: See below
Other EU regulatory information: Does not contain substances defined in the SEVESO Directive.

Cement is a mixture according to REACH and is not subject to registration. Cement clinker is exempt from registration (Art 2.7 (b) and Annex V.7 of REACH).
The marketing and use of cement are subject to a restriction on the content of soluble Cr (VI) (REACH Annex XVII point 47).

1. Cements or cement-containing mixtures must not be used or marketed if they, once mixed with water, contain more than 0.0002 % of soluble chromium (VI) in relation to the total dry weight of the cement.
2. If reducing agents are used, then the packaging of cement or cement-containing

   mixtures shall include information on the packing date, the storage conditions and the

   storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below the limit shown in paragraph 1 marked in a legible and permanent manner while the application of other Community legislation on the classification, packaging and labelling of dangerous substances and mixtures shall remain unaffected.
3. By way of derogation, paragraphs 1 and 2 shall not apply to marketing and use in controlled closed and fully automated processes in which cement and cement-containing mixtures are handled only by machinery and in which skin contact is not possible.

As part of the Social Dialogue “Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing It”, sectoral associations of employees and employers (including CEMBUREAU), have adopted “good practice guidelines” which also contain safe handling practices (http://www.nepsi.eu/good-practice-guide.aspx).

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, as amended

Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, as amended

Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Commission Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC

Commission Directive 2009/161/EU of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC

Commission Directive (EU) 2017/164 of 31 January 2017 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU

National regulatory information:

Act No. 350/2011 Sb., on chemical substances and chemical mixtures and amending some laws (the Chemical Act), as amended including implementing regulations

Act No. 258/2000 Sb. on the protection of public health and amending some related laws, as amended

Act No. 262/2006 Sb., the Labour Code, as amended

Act No. 201/2012 Sb., on air protection, as amended

Decree No. 415/2012 Sb., on the permissible level of pollution and its detection and on the implementation of some other provisions of the Air Protection Act, as amended

Act No. 254/2001 Sb., on water and amending some laws (the Water Act), as amended

Regulation of the Government of the Czech Republic No. 361/2007 Sb., laying down the conditions for the health protection of employees at work, as amended

Act No. 185/2001 Sb., on waste and amending some other laws (the Waste Act), as amended, including implementing regulations.

Act No. 477/2001 Sb., on packaging and amending some laws (the Packaging Act), as amended

Decree No. 93/2016 Sb., on the waste catalogue, as amended

Decree No. 432/2003 Sb., laying down the conditions for classifying work, the limit values of biological exposure test indicators, the conditions for the collection of biological material for the performance of biological exposure tests and the requirements for reporting work with asbestos and biological agents, as amended

15.2 Chemical Safety Assessment

No chemical safety assessment has been carried out for this mixture. Such an assessment would be based on the information shown in the components' SDSs.

SECTION 16: OTHER INFORMATION

The data are based on our latest knowledge, but are not a guarantee of any specific product properties and do not establish any legally valid contractual relationship.

16.1 Hazard statements

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

16.2 Precautionary statements

P102 Keep out of reach of children

P280 Wear protective gloves, protective clothing and eye protection (for more details see the Safety Data Sheet).

P305+P351+P338+ P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician.

P302+P352+P333+P313 IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

P261+P304+P340+P312 Avoid breathing dust. FOLLOWING INHALATION: Move the person to fresh air and keep them in a position that facilitates breathing. If they do not feel well, call a doctor/physician.

P501 Dispose of contents/container according to applicable waste and packaging regulations.

16.3 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 (CLP)

Eye Dam 1, H318 – on basis of test data
Skin Irrit. 2, H315 – on basis of test data
Skin Sens. 1B, H317 – on basis of test data
STOT SE 3, H335 – human experience

16.4 Abbreviations and acronyms

ACGIH	American Conference of Industrial Hygienists
ADR/RID	European Agreements on the transport of Dangerous goods by Road/Railway)
APF	Assigned protection factor
SDS	Safety Data Sheet
CAS	Chemical Abstracts Service (maintains the most complete list of chemical substances). Each substance listed in the CAS Registry is assigned a CAS Registry Number. The CAS Registry Number (commonly referred to as the CAS Number) is broadly used a specific numerical designation of a chemical substance.
CLP	Classification, labelling and packaging (Regulation (EC) No 1272/2008)
COPD	Chronic Obstructive Pulmonary Disease
DNEL	Derived no-effect level (a level at which there is not adverse impact on human health)
Eye Dam 1	Serious eye damage
EC_{50}	Half maximal effective concentration (concentration that causes the death or immobilization of 50% of testing organisms, such as Daphnia magna))
ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Commercial chemical Substances
EPA	Type of high efficiency air filter
EpiDerm TM	Reconstructed human epidermis for testing purposes

ES / SE	Exposure scenario
GefStoffV	Gefahrstoffverordnung (hazardous substances)
HEPA	Type of high efficiency air filter
H&S	Health and Safety
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods
LC_{50}	Median lethal concentration (concentration that causes death of 50% of the test fish in the relevant time period))
LD_{50}	Median lethal dose
LOEL	Lowest observed effect level (i.e. the lowest tested dose or exposure level at which a statistically significant effect was observed in the exposed population compared to an appropriate control group in a particular study)
MEASE	Metals estimation and assessment of substance exposure, a tool for substance exposure estimation and assessment, EBRC Consulting GmbH for Eurometaux, http://www.ebrc.de/ebrc/ebrc-mease.php
MS	Member State
NOEC	No observable effect concentration (the highest tested concentration of a toxic substance at which there has not yet been a statistically significant adverse effect on organisms compared to the control group (approx. up to 5% mortality), concentration not causing a visible effect)
NOEL	No observed effect level (a dose with no observed effect - the no observed effect level is the highest tested dose or exposure level at which no statistically significant effects were detected in the exposed group compared to the appropriate control group in a particular study)
OECD	Organisation for Economic Co-operation and Development
OECD TG	OECD Technical Guidance
OELV	Occupational exposure limit value
PBT	Persistent, bioaccumulative and toxic
PEL_c	Permissible exposure limit
PNEC	Predicted no-effect concentration (a concentration level at which there is not adverse impact on the environment)
PROC	Process category
REACH	Registration, Evaluation and Authorisation of Chemicals (Regulation (EC) No 1907/2006)
RPE	Respiratory protective equipment
SCOEL	Scientific Committee on Occupational Exposure Limit Values
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation
STOT	Specific Target Organ Toxicity, SE – single exposure, RE – repeated exposure
STP	Sewage treatment plant
TLV-TWA	Threshold Limit Value-Time-Weighted Average (threshold limit, time-weighted average concentration of a chemical substance in the air ($mg.m^{-3}$) to which an employee may be exposed during the working hours, usually 8 hrs)
TRGS	Technische Regeln für Gefahrstoffe
UFI	Unique Formula Identifier
UVC	Substance of unknown or variable composition, complex reaction products
UVCB	Substance of unknown or variable composition, complex reaction products or biological materials
VLE-MP	Exposure limit value - weighted average in mg by cubic meter of air
vPvB	Very persistent, very bioaccumulative
WWTP	Waste water treatment plant

16.5 Key literature references and sources of data

(1) *Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006. Available from: http://www.hse.gov.uk/pubns/web/portlandcement.pdf.*
(2) *Observations on the effects of skin irritation caused by cement, Kietzman et al, Dermatosen, 47, 5, 184-189 (1999).*
(3) *European Commission's Scientific Committee on Toxicology, Ecotoxicology and the Environment (SCTEE) opinion of the risks to health from Cr (VI) in cement (European Commission, 2002). http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf.*
(4) *Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr (VI) in cement, NIOH, Page 11, 2003.*
(5) *U.S. EPA, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 3rd ed. EPA/600/7-91/002, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1994a) and 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (2002).*
(6) *U.S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 4th ed. EPA/600/4-90/027F, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1993) and 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (2002).*
(7) *Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D.C., 2001.*
(8) *Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.*
(9) *TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.*
(10) *TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.*
(11) *TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.*
(12) *Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Van Berlo et al, Chem. Res. Toxicol., 2009 Sept; 22(9):1548-58.*
(13) *Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.*
(14) *Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008.*
(15) *Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.*
(16) *MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, http://www.ebrc.de/ebrc/ebrc-mease.php.*
(17) *Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations*, Käre Lenvik, Helge kjuus, NIOH, Oslo, December 2011
(18) *ECHA Support ECHA Support Questions and answers agreed with National Helpdesks. ID1695 May 2020. https://echa.europa.eu/es/support/qas-support/qas-agreed-with-national-helpdesks*
(19) *www.echa.eu*

16.6 Indication of changes / revisions

The Safety Data Sheet was issued in its seventh, unrevised version. The SDS was updated as required by the applicable legislation - the main updates consisted of deleting the original classification and markings in accordance with Directives 1999/45/EC and 67/45/EEC and incorporating amended chapter titles.

The Safety Data Sheet was issued in its eighth, unrevised version. The SDS was updated as required by the applicable legislation - the main updates consisted of incorporating the requirements of Annex VIII to the CLP Regulation and Commission Regulation (EU) 2020/878 amending Annex II to the

REACH Regulation, including the addition of the requirements of this amendment and the incorporation of the amended chapter titles in the Safety Data Sheet.

16.7 Training advice

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

16.8 Disclaimer

The information on this data sheet reflects the currently available knowledge and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product, including the use of the product in combination with any other product or any other process, is the responsibility of the user.
It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.

This safety data sheet (SDS) was drafted in accordance with the provisions of the REACH Regulation (EC) No 1907/2006; Article 31), as amended. It describes the conditions for the necessary precautionary measures when handling the material. It is the responsibility of the recipients (customers, users, distributors, etc.) of the safety data sheet to ensure that the information contained therein is correctly understood by all workers who may use, process, handle or in any way come into contact with the product. The information and instructions given in this safety data sheet are based on the current state of scientific and technical knowledge at the time of publication. This information is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product, including the use of the product in combination with any other product or any other process, is the responsibility of the user. It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities. This document does not guarantee the technical execution and processing of the material, its suitability for specific applications, and it does not replace a legally valid contractual relationship.

(Guidelines for SDS and the SDS template assembled by CEMBUREAU on the basis of information and documentation supplied by CEMBUREAU Members were used as a guidance. CEMBUREAU Members may wish to use the guidelines and the template as a guidance and basis for the creation of SDS for their products. CEMBUREAU cannot represent, warrant or guarantee the accuracy, reliability or completeness of these documents to either CEMBUREAU Members or third parties. It is the user's responsibility to satisfy itself as to the suitability, correctness and completeness of such information for its purpose, and it is the manufacturer's, importer's and distributor's responsibility to provide accurate SDS for the cement and cement products they market.
The Czech version of the Safety Data Sheet was expertly prepared by Výzkumný ústav maltovin Praha, s.r.o. for the members of Svaz výrobců cementu ČR (The Czech Cement Manufacturers' Association).

Annex to the SDS – Exposure Scenarios (Uses)

[NN] National notes, clarifications and additions

Annex: Additional tables with engineering controls and individual protection measures for Subsection 8.2

1. Inhalation DNEL of 1 mg/m³ (dust from the manufacture of Portland cement clinker)

8.2.1 Appropriate engineering controls

Use	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week): (#) < 240 min	not required	-
	14, 26		(A) not required or (B) generic local exhaust ventilation	- 78%
	5, 8b, 9		generic local exhaust ventilation	78%
Industrial use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		(A) not required or (B) generic local exhaust ventilation	- 78%
	5, 8b, 9		generic local exhaust ventilation	78%
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) not required or (B) generic local exhaust ventilation	- 78%
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		(A) not required or (B) generic local exhaust ventilation	- 72%
	9, 26		(A) not required or (B) generic local exhaust ventilation	- 72%
	5, 8a, 8b, 14		generic local exhaust ventilation	72%
	19 (#)		Local measures are not applicable, only in well-ventilated rooms or outdoors	50%
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) not required or (B) generic local exhaust ventilation	- 72%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

8.2.2 Individual protection measures, such as personal protective equipment

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week): (#) < 240 min	not required	-
	14, 26		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		P2 mask (FF, FM)	APF = 10
Industrial use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
	5, 8b, 9		P2 mask (FF, FM)	APF = 10
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) P3 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 20 APF = 4
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		(A) P2 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 10 APF = 4
	9, 26		(A) P3 mask (FF, FM) or (B) P2 mask (FF, FM)	APF = 20 APF = 10
	5, 8a, 8b, 14		P3 mask (FF, FM)	APF = 20
	19 (#)		P3 mask (FF, FM)	APF = 20
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) P3 mask (FF, FM) or (B) P2 mask (FF, FM)	APF = 20 APF = 10
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

2. Inhalation DNEL of 5 mg/m³ (Portland cement clinker)

8.2.1 Appropriate engineering controls

Use	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		(A) not required or (B) generic local exhaust ventilation	- 78%
	5, 8b, 9		(A) not required or (B) generic local exhaust ventilation	- 82%
Industrial use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		(A) not required or (B) generic local exhaust ventilation	- 78%
	5, 8b, 9		(A) general ventilation or (B) generic local exhaust ventilation	- 82%
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) not required or (B) generic local exhaust ventilation	- 78%
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		(A) not required or (B) general ventilation	- 29%
	9, 26		(A) not required or (B) generic local exhaust ventilation	- 77%
	5, 8a, 8b, 14		(A) not required or (B) generic local exhaust ventilation	- 72%
	19		Local measures are not applicable, only in well-ventilated rooms or outdoors	50%
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) not required or (B) generic local exhaust ventilation	- 77%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

8.2.2 Individual protection measures, such as personal protective equipment

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	5, 8b, 9		(A) P2 mask (FF, FM) or (b) not required	APF = 10 -
Industrial use of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	5, 8b, 9		(A) P2 mask (FF, FM) or (b) not required	APF = 10 -
Industrial uses of wet suspension of hydraulic building and construction materials	7		(A) P2 mask (FF, FM) or (b) not required	APF = 10 -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (indoor, outdoor)	2		(A) P1 mask (FF, FM) or (b) not required	APF = 4 -
	9, 26		(A) P2 mask (FF, FM) or (b) not required	APF = 10 -
	5, 8a, 8b, 14		(A) P3 mask (FF, FM) or (B) P1 mask (FF, FM)	APF = 20 APF = 4
	19		P2 mask (FF, FM)	APF = 10
Professional use of wet suspensions of hydraulic building and construction materials	11		(A) P2 mask (FF, FM) or (b) not required	APF = 10 -
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROCs are identified uses and are defined in Section 1.2.

End of Safety Data Sheet