



# SAFETY DATA SHEET

PURSUANT TO THE REGULATION (EC) NO. 1907/2006 (REACH) AS AMENDED

Product: Cement according to EN 197-1

Common cements

Date of issue: 7/2020 Rev. 6 replaces all previous versions Print date: 30 July 2020

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Name of the mixture: Common cement in accordance with EN 197-1 standard

- Portland cement
- Portland cement with limestone
- Portland slag cement
- Portland mixed cement
- Blast furnace cement
- Portland composite cement
- Composite cement

Synonyms: not specified

Chemical name and formula: mixture

Trade name: none

CAS: mixture

EINECS: mixture

Molar mass: not registered, mixture

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

Cements are used in industrial facilities for the production/manufacturing of hydraulic binders in the building industry and for building works, such as concrete, mortars, plasters, grouts, as well as concrete prefabricated components.

Common cements and mixtures containing cement (hydraulic binders) are used in the industry by both professional users and consumers in building industry and for internal and external building works. Determined use of cements and cement mixtures include dry products and wet products (suspensions, pastes).

PROC	Determined use - process category	Production / manufacturing	Professional / industrial use
		in building industry and building materials	
2	Use within a continuous closed production process with occasionally controlled exposure (e. g. sampling)	x	x
3	Use during within a closed batched production process (synthesis or formulation)	x	x
5	Mixing or blending in the batched production processes during formulation of preparations and items (more stages and/or significant contact)	x	x
7	Spraying techniques in industrial facilities and applications		x
8a	Transport of substance or preparation (filling up / emptying) from/to containers/huge containers in non-		x



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	specialized facilities		
8b	Transport of substance or preparation (filling up / emptying) from/to containers/huge containers in specialized facilities	x	x
9	Transport of substance or preparation into small containers (special filling machine, incl. weighing out)	x	x
10	Application of glues and other surface materials by a roller or brush		x
11	Spraying techniques outside industrial facilities and applications		x
13	Treatment of items by soaking and pouring		x
14	Production of preparations or items by tableting, compression, extrusion, pelletizing	x	x
19	Manual mixing during which there is a direct contact with the substance; only personal protective equipment is available		x
22	Potentially closed manufacturing processes with minerals / metals at increased temperature		x
26	Handling with solid inorganic substances at ambient temperature	x	x

### 1.3 Details of the supplier of the safety data sheet

Company name: CEMMAC a.s.

Full address: Cementárska 14/14  
914 42 Horné Srnie  
Slovak Republic

Tel.: +421 32 6576 211 Fax: +421 32 6588 304

Email: mail@cemmac.sk

### 1.4 Emergency telephone number:

Národné Toxikologické Informačné Centrum [National Toxicology Information Centre], Limbová 5,  
833 05 Bratislava

Working hours: 24h/7d

Tel: +421 254 774 166

Services are provided in the Slovak language.



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## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### 2.1.1 According to Regulation (EC) No. 1272/2008

Hazard class	Hazard category	Classification procedure
Skin Irrit. 2	2	Based on test data
Eye Dam. 1	1	Based on test data
Skin Sens. 1B	1B	Based on literature research
Toxic to specific target organs – single exposure. Respiratory irritation (STOT SE 3)	3	Based on literature research

*Hazard statements:*

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

### 2.2. Label elements

#### 2.2.1. According to Regulation (EC) No. 1272/2008

*Dangerous substances*

Cement (Portland) clinker  
Dusts from Portland clinker production

Hazard pictograms



Danger

- H318 Causes serious eye damage.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H335 May cause respiratory irritation.
- P102 Keep out of reach of children.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.



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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 Toxicology Information Centre, Bratislava or doctor.

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

P261 + P304 + P340 + P312 Avoid breathing dust. IF INHALED: Provide fresh air and keep at rest in a position comfortable for breathing. If not feeling well, call Toxicology Information Centre, Bratislava or doctor.

P501 Dispose of contents/container... according to local / regional regulations.

## Additional information

Contact with wet cement, fresh concrete or mortar with skin may cause irritation, dermatitis or acid burning. May cause damage to products made of aluminium or other non-noble metals.

## 2.3. Other hazards

Cements do not satisfy criteria for PTB or vPvB in accordance with Annex XIII of the REACH document (Regulation (EC) No. 1907/2006). No other hazards are known or expected.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Not applied - Mixture

### 3.2 Mixtures

Cement for general use in accordance with EN 197-1 and EN 197-5.

Dangerous substances:

Name	Portland cement clinker	Dusts from Portland clinker production
EC No.	266-043-4	270-659-9
CAS No.	65997-15-1	68475-76-3
Registration No.	not assigned (see para. 15.1)	01-2119486767-17-0082
Concentration range (% w/w)	5 - 100	0 - 5
Classification according to EC Regulation 1272/2008		
Hazard classes and categories	Eye Dam. 1 Skin sens. 1B Skin irrit. 2 STOT SE 3	Eye Dam. 1 Skin sens. 1B Skin irrit. 2 STOT SE 3
H-phrases	H315, H317, H318, H335	H315, H317, H318, H335



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Other substances:

Name	Blast furnace slag	Calcium sulphate	Limestone	Fly ash
Concentration range (% w/w)	In accordance with EN 197-1	In accordance with EN 197-1	In accordance with EN 197-1	In accordance with EN 197-1
Registration No.	01-2119487456-25-xxxx	01-2119444918-26-xxxx	Exempted, Annex IV, REACH	01-2119491179-27-xxxx
EINECS	266-002-0	7778-18-9	215-279-6	931-322-8
CAS No.	65996-69-2	231-900-3	1317-65-3	-
Classification according to EC Regulation 1272/2008				
Hazard classes and categories	-	-	-	-
H-phrases	-	-	-	-

## SECTION 4: First-aid measures

### 4.1 Description of first-aid measures

#### General information

First-aid responders do not need to use any personal protective equipment. Personnel providing first aid should avoid contact with wet cement or mixtures containing cement.

#### Following eye contact

Do not rub your eyes so that you do not damage cornea mechanically. Remove contact lenses if you use them. Tilt the head to the side of the affected eye, open eyelids wide and carefully rinse the eye (eyes) with plenty of water for the period of at least 20 minutes in order to remove any particles. Prevent from fouling up the unaffected eye with particles. If possible, use isotonic water (0.9% NaCl), visit a specialist for professional diseases or specialized optician.

#### Following skin contact

Remove dry cement and rinse with plenty of water. In case of wet/damp cement wash the skin with plenty of water. Remove the contaminated clothes, shoes, watches, etc. and carefully clean them before their next use. In case of any irritation or burning seek medical attention.



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## *Following inhalation*

Provide fresh air. Dust (cement) from throat (neck) and nasal cavity should be released spontaneously. If it persists or irritation appears later or nausea, cough or other symptoms persist, obtain medical attention.

## *Following ingestion*

Do not induce vomiting. If the person is conscious, rinse his/her mouth with water and let him/her drink plenty of water. Immediately obtain medical attention or contact Toxicology Information Centre, Bratislava.

## **4.2. Most important symptoms and effects, both acute and delayed**

*Eyes:* Contact of eyes with cement (dry or wet) may cause serious and potentially irreversible injury.

*Skin:* Cement may have irritation effects to wet skin (due to sweating or soaking) or it may cause contact dermatitis after repeated contact. Further contact of skin with wet cement or concrete may cause serious burning (acid burning), because it is developed with initial absence of pain (e.g. kneeling in wet concrete, even through clothing).

For more details see reference (1)

*Inhaling:* Long-term repeated inhaling of common cement increases risk of respiratory diseases development.

*Environment:* Common cements are not dangerous for environment when used normally.

## **4.3 Indication of any immediate medical attention and special treatment needed.**

Follow the advice given in section 4.1. Take this safety data sheet with you when visiting your doctor.

## **SECTION 5: Fire-fighting measures**

### **5.1 Extinguishing media**

Common cements are not flammable.

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

Cements are not flammable / combustible and do not enable, nor support burning of other materials.

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

Cements do not cause any fire-related hazard. Fire-fighters do not need any special protective equipment.

## **SECTION 6: Accidental release measures**

### **6.1 Personal precautions, protective equipment and emergency procedures**

#### **6.1.1 For non-emergency personnel**



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Wear protective equipment as it is described in Section 8 and follow the instructions for safe handling and use specified in Section 7.

## 6.1.2 For emergency responders

Emergency procedures are not applied. Protection of airways is necessary in cases of high levels of dustiness. For more details see Section 7.1.2

## 6.2 Environmental precautions

Do not release cement into sewage and drainage systems or water areas (e.g. watercourses).

## 6.3 Methods and material for containment and cleaning up

Collect the spilled dry material and use it, if it is not polluted or spoiled.

### *Dry cement*

Use dry methods of disposal, such as cleaning by suction or vacuuming (industrial mobile units equipped with air-filters highly effective against particles (EPA and HEPA filters, EN 1822 - 1:2009) or similar equipment) which reduces dust emissions into air and does not cause dispersion/dusting. Never use compressed air.

Wet cleaning is possible (water spray, fine water mist), avoid increase of dust, swipe the dust and remove the newly-emerged sediments (see wet cement). During wet cleaning vacuuming and brushing is not possible, ensure that employees were wearing adequate personal protective equipment and prevent dust dispersal.

Avoid inhaling cement and contact with skin. Collect spilled material into containers and use it. Let it solidify before its disposal, as described in Section 13.

### *Wet cement*

When cleaning wet cement, place it into a container. Let the material dry and solidify before its disposal, as it is described in Section 13.

## 6.4 Reference to other sections

For more details see Sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

#### 7.1.1 Protective measures

Follow recommendations given in Section 8. See Chapter 6.3 for disposal of dry cement.

Measures to avoid fire

Not applied.

Measures to avoid appearance of aerosols and dust

Do not sweep. Use dry methods of removal, such as removal by vacuuming or suction, which reduces emissions of dust into air.

Measures to protect environment

No specific measures.



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## 7.1.2 Information on general hygiene at work

Do not handle materials or do not store them near food or drinks or smoking accessories. Wear dust mask or respirator and protective glasses in dusty environment. Wear protective gloves to avoid contact with skin.

## 7.2 Conditions for safe storage, including any incompatibilities

Loose cement should be stored in silos which are watertight, dry (i.e. with minimized internal condensation), clean and protected against pollution. Risk of drowning: Cement may accumulate on walls of the closed spaces or stick to them. Cement may unexpectedly loosen, collapse or fall down. Do not enter closed spaces such as silos, reservoirs, trucks for transport of loose materials or other storing containers or vessels in which cements are stored or which contain cements because of the risk of drowning or suffocation, even if you have adopted appropriate safety measures. Do not use aluminium packages because of material incompatibility. Packed products should be stored in original and well closed bags, in cool and dry place, protected against pollution to avoid loss of quality. Bags should be stored (layered) in a constant way. Do not use aluminium containers because of material incompatibility.

## 7.3 Specific end use(s)

There is no other information for specific end use (see point 1.2.)

## 7.4 Control of content of soluble Cr(VI)

According to regulations specified in Section 15 the effectiveness of the reduction agent decreases with time in cements treated by reduction agent Cr(VI). That is why cement bags and/or delivery documentation must contain information about the date of packing, storage conditions and storage period during which the activity of the reduction agent is preserved and the content of hexavalent chrome is kept under 0.0002 % of the total weight of cement, in accordance with EN 196-10. Specified storage conditions must be specified in order to preserve the efficiency of the reduction agent.

## SECTION 8. Exposure controls / personal protection

### 8.1 Control parameters

DNEL inhaling (8h): 3 mg/m<sup>3</sup>

DNEL dermal: not applied

DNEL oral: not relevant

DNEL values are related to respirable dust, whereas exposure estimates for MEASE tool reflect inhaling fraction. That is why another safety reserve is an inseparable part of risk management assessment and derived measures of risk management. There is no DNEL value for cements for dermal exposures for employees, not even from safety studies or human practice. Dermal exposure must be lowered up to technically executable minimum because cements are classified as skin and eye irritants.

PNEC aquatic environment: not applied

PNEC sediment: not applied

PNEC soil environment: not applied





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Assessment of exposure into aquatic environment is based on possible pH changes. Determination of exposure is carried out by an assessment of final pH impact. pH value of surface water, underground water and sewage water should not exceed the value of 9.

Hygienic limits in working environment:

Name	Limit value	Exposure limit value	Exposure intensity	Legal reference
Portland cement	OEL total inhaled dust	5 (E) mg/m <sup>3</sup>	Limit value of working environment	TRGS 900 (17)
Cement	OEL inhaled dust	10 (E) mg/m <sup>3</sup>		
	OEL lung share	3 (A) mg/m <sup>3</sup>		
Cement	Soluble Cr(VI) (dermal exposure)	2 ppm	short-term (acute) long-term (repeated)	Regulation (EC) No 1907/2006

## 8.2 Exposure controls

For each individual PROC, companies/users can select either option A) or B) in the table below, depending on what is more suitable for their particular situation. If one of the options is selected, then the same option should be selected in the table in section "8.2.2 Individual protection measures, including personal protective equipment" - Respiratory protection specifications. Only combinations A) - A) and B) - B) are possible.



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## 8.2.1 Appropriate engineering controls

Measures to eliminate dust and prevent dust spread in the environment, such as dust removal, suction ventilation and dry methods of removal which do not cause dispersion in air.

Exposure scenario	PROC*	Exposure	Local control / local measures	Effectiveness
Industrial production of hydraulic building and construction materials	2, 3	Length is not limited (up to 480 minutes per shift, 5 shifts per week)	not required	-
	14, 26		A) not required or B) common local exhaust	- 78%
	5, 8b, 9		A) full / total ventilation or B) common local exhaust	17% 78%
Industrial use of dry hydraulic building and construction materials (internal, external)	2		not required	-
	14, 22, 26		A) not required or B) common local exhaust	- 78%
	5, 8b, 9		A) full / total ventilation or B) common local exhaust	17% 78%
Industrial use of wet suspensions of hydraulic building and construction materials	7		A) not required or B) common local exhaust	- 78%
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (internal, external)	2		not required	-
	9, 26		A) not required or B) common local exhaust	- 72%
	5, 8a, 8b, 14		A) not required or B) integrated local ventilation	- 87%
	19		Local measures are not applicable, only in well air-conditioned rooms or outside	50%
Professional use of wet suspensions of hydraulic building and construction materials	11		A) not required or B) common local exhaust	- 72%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

\*PROC are determined uses and they are defined in point 1.2.



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## 8.2.2 Individual protective measures such as personal protective equipment

*Generally:* Avoid kneeling in wet mortar or concrete at work, if possible. If kneeling cannot be avoided, use appropriate waterproof personal protective equipment. Do not eat, drink or smoke during the work with cement, thus preventing a contact with skin and mouth. Before starting the work with cement use protective cream and use it in regular intervals repeatedly. After finishing the work with cement or materials containing cement it is necessary for employees to have a shower or use skin moisturizing preparations. Remove the contaminated clothes, shoes, watches, etc. and carefully clean them before their next use.

Eye and face protection



Do not wear contact lenses. When handling dry or wet cement wear the approved eyewear or safety goggles according to EN 166 in order to avoid contact with eyes.

Skin protection



Wear waterproof gloves resistant to abrasion and alkalis (made of material with small content of soluble CR(VI), with cotton lining, high boots, clothes with closed sleeves and trousers, as well as skin protective equipment (including protective creams) in order to protect the skin against long-term contact with wet cement. It is especially important to prevent wet cement to get into shoes. When contact cannot be avoided, e.g. in case of laying / application of concrete mixture or coating, use waterproof resistant trousers and knee-protection.

Respiratory protection



In case of potential exposure to levels of dust above the exposure limits, use airways protection. The protection should be adjusted / adapted to the dust level and should satisfy the corresponding EN standard (e.g. EN 149, EN140, EN14387, EN1827) or be in accordance with national standards.

Thermal hazard

Not relevant.



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Exposure scenario	PROC*	Exposure	Local control / local measures	Effectiveness
Industrial production of hydraulic building and construction materials	2.3	Length is not limited (up to 480 minutes per shift, 5 shifts per 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 (internal, external)	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 use of wet suspensions 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 (internal, external)	2		A) P1 mask (FF, FM) or B) not required	APF = 4 -
	9, 26		A) P2 mask (FF, FM) or 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	-	

\*PROC are determined uses and they are defined in point 1.2.

APF survey of various RPE (according to STN EN 529:2005) can be found in the MEASE glossary (16). When wearing each RPE, as defined above, more principles must be simultaneously applied - comparison of working hours with actual exposure time. These should reflect physiological stress (strain) of the employee when wearing them - worsened breathing, weight of RPE, higher thermal stress due to head cover. In addition, it is assumed that using tools and communication is also reduced. That is why the employee should be (i) healthy (especially in respect of health problems which may affect using RPE), (ii) have appropriate features / shape of face for the given type of RPE in order to minimize penetrations between the face and mask (with respect to scars and moustache). If the recommended apparatus does not fit tightly, it will not provide a safe protection.



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Employers and self-employed persons are legally responsible for maintenance and issue of personal protective equipment for airways and control of their proper use at workplace. That is why they should define and document the proper handling of the breathing apparatus, including training of employees.

## 8.2.3 Environmental exposure controls

Environmental exposure control of emissions of cement particles into air must be in accordance with available technology and regulations for emissions of dust particles generally. Environmental exposure control is relevant for aquatic environment as emissions of cements in different phases of life cycle (production and use), especially in respect to the underground and sewage water. The effect in aquatic environment and risk assessment includes effects to organisms / ecosystems as a result of potential change related to pH (hydroxides dissolution). Toxicity of other dissolved inorganic ions is expected to be negligible in comparison with possible effect of the pH change. Local assessment is expected in relation to the pH change for any effects that may appear during the production and use. The sewage water and surface water pH should not exceed 9. Otherwise, it could lead to an impact on the municipal sewage treatment plants and industrial sewage treatment plants. The following steps are recommended in respect of such exposure assessment:

Stage 1: Get any information about the sewage pH and cement contribution to the resulting pH. If the pH value is higher than 9, it can be caused by cement; further steps are then needed in order to provide safe use.

Stage 2: Get any information about the pH of water in the point of inflow. The pH value of water cannot exceed 9.

Stage 3: Measure pH in the recipient in the point of outflow. If the pH value is lower than 9, safe use is adequately provable. If the established pH value is higher than 9, risk management measures must be adopted: sewage water must be neutralized and safe use of cement during production or its use must be ensured.

No special measures for regulation of emissions with respect to terrestrial environment (soil) are required.

## SECTION 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

This information applies to the whole mixtures.

- (a) Appearance: Dry cements are finely ground solid inorganic materials (grey or white powder). Size of particles mainly 5-30  $\mu\text{m}$ .
- (b) Odour: Odourless
- (c) Odour threshold value: no odour limit, without odour
- (d) pH: (T = 20 °C in water, ratio of water to solid substance 1:2) 11 - 13.5
- (e) Melting point / Solidification point: > 1 250 °C
- (f) Initial boiling point and boiling range: Shall not be used, because in normal atmospheric conditions the boiling point is > 1 250 °C
- (g) Flash point: not applied, because it is not liquid.
- (h) Evaporation rate: Not applied, because it is not liquid.
- (i) Flammability (solid, gas): Not applied, because it is solid substance which is not flammable and does not cause fire as a result of friction, nor contributes to it.



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- (j) Upper / lower flammability or explosive limits: Not applied, because it is not a flammable gas.
- (k) Vapour pressure: Not applied, because the melting point is  $> 1\ 250\ ^\circ\text{C}$
- (l) Vapour density: Not applied, because the melting point is  $> 1\ 250\ ^\circ\text{C}$
- (m) Relative density: 2.75 - 3.20; apparent density: 0.9 - 1.5 g/cm<sup>3</sup>
- (n) Solubility (- i) in water (T = 20 °C): low 0.1- 1.5 g/l
- (o) Partition coefficient: n - octanol / water. Not applied, because it is an inorganic substance.
- (p) Auto-ignition temperature: Not applied (it is not pyrophoric / has no pyrophoric characteristics, there are no organometallic, organomalloid or organophosphate binders or their derivatives, nor other pyrophoric components).
- (q) Decomposition temperature: Not applied, because no organic peroxide is present.
- (r) Viscosity: Not applied, because it is not liquid.
- (s) Explosive properties: Not applied, because it is not explosive or pyrotechnics; the substance itself cannot chemically react and produce gas at such temperature, pressure and rate in which it would cause damage to its environment. It is not capable of spontaneous exothermal chemical reaction.
- (t) Oxidation properties: Not applied, because it does not cause burning of other materials, nor contributes to it.

## 9.2 Other information:

Not applied.

## SECTION 10. Stability and reactivity

### 10.1 Reactivity

After mixing with cement, it will solidify into stable mass which is not reactive in normal environment.

### 10.2 Chemical stability

Dry cements are stable if they are stored properly (see Section 7) and they are compatible with majority of other building materials. It is necessary to store them in a dry place. It is necessary to avoid contact with incompatible materials.

Wet cement is alkaline and incompatible with acids, ammonium salts, aluminium or other non-noble metals. Cement is soluble in hydrofluoric acid generating caustic gas of silicon tetrafluoride. Cements react with water generating silicates and calcium hydroxide. Silicates in cements react with strong oxidizing agents such as fluor, boron fluoride, chlorine fluoride, manganese fluoride and oxygen difluoride.

### 10.3 Possibilities of hazardous reactions

Cement does not cause any hazardous reactions.

### 10.4 Conditions to avoid

Wet conditions during storing may cause clumping and loss of the product quality.

### 10.5 Incompatible materials

Acids, ammonium salts, aluminium or other non-noble metals. It is necessary to avoid uncontrolled use of aluminium powder, hydrogen is generated /developed.



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## 10.6 Hazardous decomposition products

Cements do not decompose to any hazardous products.

## SECTION 11: Toxicological information

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

#### 11.1.1. Substances

Not applied – a mixture.

#### 11.1.2. Mixtures

Hazard class	Cat.	Effect	Reference
Acute toxicity - dermal	-	Limit test, rabbit, contact after 24 hours, 2000 mg/kg of body weight, non-lethal. Based on available data classification criteria are not fulfilled.	2
Acute toxicity - inhalation (gases, vapours, dust and mist)	-	No acute effects were noticed when inhaled. Based on available data classification criteria are not fulfilled.	9
Acute toxicity - oral	-	No data about toxicity result from studies of dust generated from the production of Portland clinker. Based on available data classification criteria are not fulfilled.	Literature research
Causticity / skin irritant	2	Contact of cement with wet skin may cause swelling, cracking or bursting of skin. Further contact with simultaneous friction may cause strong burning.	2, human experience
Serious eye damage / eye irritation	1	Portland clinker caused various reflection of influences to cornea and the calculated index of irritation was approx. 128. Common cements contain different quantity of Portland clinker, fly ash, blast furnace slag and gypsum. Direct contact with cement may cause mechanical damage to cornea or immediate or late irritation or inflammation. Direct contact with higher quantity of dry cement dust or spraying by wet cement may cause effects varying from light irritation of eyes (e.g. conjunctivitis or eyelid inflammation) up to chemical burnings / acid burning and loss of sight.	10, 11
Skin sensitisation	1B	After exposure to wet cement dust some individuals may suffer from eczema caused either by high pH causing contact dermatitis due to long-term irritation, or an immunological reaction to soluble Cr(VI) which causes contact allergic dermatitis. Reaction may appear in various forms from light rash up to heavy dermatitis and it is a combination of both above mentioned mechanisms. If cement contains reduction agent for reduction of content	3, 4, 17



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		of soluble Cr(VI) and if during storage period limit for soluble Cr(VI) is not exceeded, sensitising effects are not expected.	
Respiratory sensitisation	-	No signs of respiratory hypersensitiveness. Based on available data classification criteria are not fulfilled.	1
Germ cell mutagenicity	-	No indication. Based on available data classification criteria are not fulfilled.	12, 13
Carcinogenicity	-	No causal connection between exposure to Portland cement and cancer was confirmed. Epidemiological literature does not support the classification of Portland cement as a possible human carcinogen. Portland cement is not classified as human carcinogen (according to ACGIH A4: Agents which cause worries about carcinogenicity for people, but which cannot be objectively assessed due to lack of information. Studies in vitro or on animals do not provide indications of carcinogenicity which are sufficient for classification by any of other identifications). Based on available data classification criteria are not fulfilled.	1 14
Reproductive toxicity	-	Based on available data classification criteria are not fulfilled.	No human experience
STOT - one time exposure	3	Dust from Portland cement may irritate throat and airways. During exposure to concentrations higher than exposure limits at the workplace coughing, sneezing and breathlessness / dyspnoea may appear. Generally, the evidence clearly shows that exposure to cement dust in working environment causes insufficiency of breathing function. However, currently available evidences are not sufficient to determine specific certainty in relation to the size of dose and these effects.	1
STOT - repeated exposure	-	There exists a COPD indication. Effects are acute due to a high exposure. No chronic effects or effects at lower concentrations were observed. Based on available data classification criteria are not fulfilled.	15
Aspiration hazard	-	Not applied, because cements are not used as aerosols.	

## Health condition worsened after exposure

Inhaling cement dust may worsen the existing airways disease or health condition, such as emphysema (lungs emphysema) or asthma or the existing condition of skin or eyes.

## 11.2 Information on other hazardous effects

Not relevant.





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## SECTION 12: Ecological information

### 12.1 Toxicity

The product is not dangerous to environment. Eco-toxicological tests of Portland cement for *Daphnia magna* (reference 5) and *Selenastrum coli* (reference 6) showed only low toxic effect. That is why values LC 50 and EC 50 could not be determined (reference 7). No sign of toxicity in sediment (reference 8). However, presence of high quantity of cement in water may cause pH increase and that is why it may be toxic for aquatic life under certain circumstances (aquatic environment, aquatic organisms).

### 12.2 Persistence and degradability

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

### 12.3 Bioaccumulative potential

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

### 12.4 Mobility in soil

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

### 12.5 Results of PBT and vPvB assessment

Irrelevant, because cements are inorganic material. Hardened cement does not represent toxic hazard.

### 12.6 Endocrine disrupting properties

Not relevant.

### 12.7 Other adverse effects

Not relevant.

Irrelevant.

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Do not dispose into sewerage system or surface waters.

**Product** - cement which exceeded its usable life / shelf-life / storage period (and if proved that it contains more than 0.0002 % of soluble Cr(VI)): must be used or sold only in controlled closed and fully automatized processes or should be recycled or liquidated in accordance with legal regulations, or reduction agent should be used again.

**Product - unused residues or spilled dry material**



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Unused dry residues or spilled dry material may be reused while observing its usable period, and in a way preventing from dusting. In case of disposal solidify with water and dispose according to the below mentioned instructions "Product - after mixing with water/adding water, solidified".

## **Product - sludge**

Let the sludge solidify, avoid spillage or pouring into sewage water and sewerage systems or into water surfaces and dispose according to the below mentioned instructions "Product - after mixing with water / after adding water it is solid".

## **Product - after mixing with water / after adding water, solidified**

Dispose according to the local legislation. Prevent from penetration into the sewerage water system. Dispose the solidified product as specific waste. Regarding the fact that solidification makes the material quite inert, the concrete waste is not dangerous.

## **Catalogue numbers of wastes (EWC):**

10 13 14 - Waste concrete and concrete sludge (10 Wastes from thermal processes, 10 13 Wastes from production of cement, lime and plaster and products made of them)

17 01 01 - Concrete (17 Building and demolition wastes (including the extracted soil from contaminated places, 17 01 Concrete, bricks, roofing and ceramics)

**Package** - Carefully empty the package and dispose in accordance with legal regulations.

15 01 01 - Paper and cardboard packages (15 Waste packages, absorption agents, cleaning textiles, filtration materials and protective clothes not determined otherwise, 15 01 Packages (including separately collected municipal waste)

## **SECTION 14: Transport information**

Common cements are not included in the international regulation on transport of dangerous goods (IMDG, IATA, ADR/RID); no classification is required. No special preventive measures are needed, except for those mentioned in Section 8.

### **14.1 UN number or ID number**

Not relevant.

### **14.2 UN proper shipping name**

Not relevant.

### **14.3 Transport hazard class(es)**

Not relevant.

### **14.4 Packing group**

Not relevant.

### **14.5 Environmental hazards**



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Not relevant.

## 14.6 Special precautions for users

Not relevant.

## 14.7 Maritime transport in bulk according to IMO instruments

Not relevant.

## SECTION 15: Regulatory information

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

Permit: Not required

Limitation of use: See below

Other regulations of the European Union: It does not contain SEVESO substances

Cement is a mixture according to the REACH Regulation (EC) 1907/2006 and is not subject to registration. Cement (Portland) clinker is excluded from the obligation to register (art. 2 sec. 7 lit. b and Annex V point 7 of the REACH Regulation).

Placing on market and use is limited due to the content of soluble Cr(VI) – Annex XVII point 47 of the REACH Regulation:

1. Cement and preparations containing cement must not be used or placed on market if after mixing with water they contain more than 0.0002 % of soluble hexavalent chrome per total weight of dry cement.
2. If reduction agents are used, package of cement or preparations containing cement must be legibly and ineffaceably marked with information about date of packing, as well as information about storage conditions and storage period suitable for maintaining the reduction agent active and maintaining the content of soluble hexavalent chrome under the limit mentioned in paragraph 1, without affecting the application of other regulations of the Union on classification, packing and marking of dangerous substances and preparations.
3. Paragraphs 1 and 2 are not applied to placing on market and use in the controlled closed and fully automatized processes in which only machinery is handling cement and preparations containing cement, and no contact with skin is possible.

Within the social dialogue "Agreement on health protection of employees by means of proper handling and proper use of crystalline silicon and products which contain it" the trade union of employees and employers (to which also CEMBUREAU belongs) accepted the so-called "Guides to good practice" containing recommendations for practice of safe handling (<http://www.nepsi.eu/good-practise-guide.aspx>).

### 15.2 Chemical safety assessment

No assessment of chemical safety of the mixture was carried out. For this mixture, the assessment was based on the information in the safety data sheets of the raw materials.

## SECTION 16: Other information



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The data are based on our current knowledge, but they do not represent guarantee of any specific properties of the product and they do not establish any lawful contractual relationship.

## 16.1. Hazard statements:

See paragraph 2.2.1

## 16.2. Safe handling instructions

See paragraph 2.2.1

## 16.3. Classification and procedures used to derive the classification of mixtures according to Regulation (EC) No. 1272/2008 (CLP)

Eye Dam. 1, H318 - based on test data

Skin Irrit. 2, H315 - based on test data

Skin Sens. 1B, H317 - based on human experience

STOT SE 3, H335 - based on human experience

## 16.4 Abbreviations and acronyms (abbreviated words)

<b>ACGIH</b>	American Conference of Industrial Hygienists
<b>ADR / RID</b>	European Agreements on the Transport of Dangerous Goods by Road / Railway
<b>APF</b>	Assigned protection factor
<b>BL=SDS</b>	Safety Data sheet
<b>CAS</b>	Chemical Abstracts Service; Chemical Abstracts Service keeps a complete list of chemical substances. Each substance registered in the CAS register has its CAS registration number. CAS registration number (usually mentioned as CAS No.) is widely used as specific numeric marking of a chemical substance.
<b>CLP</b>	Classification, labelling and packaging (EC Regulation No. 1207/2008)
<b>COPD</b>	Chronic Obstructive Pulmonary Disease
<b>DNEL</b>	Derived no effect level
<b>Eye Dam 1</b>	Serious eye damage
<b>EC<sub>50</sub></b>	Half maximal effective concentration (concentration causing death or immobilisation of 50 % of tested organisms, e.g. Daphnia magna)
<b>ECHA</b>	European Chemicals Agency
<b>EINECS</b>	European Inventory of Existing Commercial Chemical Substances
<b>EPA</b>	Type of high efficiency air filter
<b>EpiDerm TM</b>	Reconstructed human epidermis for testing purposes
<b>ES / SE</b>	Exposure scenario
<b>HEPA</b>	Type of high efficiency air filter
<b>H&amp;S</b>	Health and Safety
<b>IATA</b>	International Air Transport Association
<b>IMDG</b>	International Agreement on the Maritime Transport of Dangerous Goods
<b>LC<sub>50</sub></b>	Lethal concentration, 50% (lethal concentration causing death of 50 % of tested fish in the given time period)
<b>LD<sub>50</sub></b>	Median lethal dose
<b>LOEL</b>	The lowest observed effect level (it means the lowest tested dose or exposure level during which a statistically significant effect in exposed population in comparison with a suitable control group was observed in certain study)



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<b>MEASE</b>	Metals estimation and assessment of substance exposure (a tool for estimate and assessment of a substance exposure, EBRC Consulting GmbH for Euromeraux, <a href="http://www.ebrc.de/ebrc/ebrc-mease.php">http://www.ebrc.de/ebrc/ebrc-mease.php</a> )
<b>MS</b>	Member State
<b>NOEC</b>	No observable effect concentration (the highest tested concentration of a toxic substance during which no statistically significant adverse effect to organisms occurred in comparison with the control group (approx. up to 5% of mortality), a concentration not causing a visible effect)
<b>NOEL</b>	No observed effect level (a dose without an observed adverse effect - it is the highest tested dose level or exposure level during which no statistically significant effects were observed in the exposed group in comparison with a suitable control group in certain study)
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OELV</b>	Occupational exposure limit value
<b>PBT</b>	Persistent, bioaccumulative and toxic
<b>PEL<sub>c</sub></b>	Permissible exposure limit
<b>PNEC</b>	Predicted no-effect concentration (a determined concentration during which no adverse effects to environment occurs)
<b>PROC</b>	Process category
<b>REACH</b>	Registration, Evaluation and Authorisation of Chemicals - registration, evaluation and authorisation and restriction of chemicals (EC Regulation No. 1907/2006)
<b>SCOEL</b>	Scientific Committee on Occupational Exposure Limit Values
<b>Skin Irrit.</b>	Skin irritation
<b>Skin Sens.</b>	Skin sensitisation
<b>STOT</b>	Specific Target Organ Toxicity, SE - one time, RE - repeated exposure
<b>STP</b>	Sewage treatment plant
<b>TLV-TWA</b>	Threshold Limit Value-Time-Weighted Average (threshold limit, time-weighted average concentration of chemical substance in air (mg.m <sup>-3</sup> ) which the employee may be exposed to during working hours, usually 8 hours)
<b>TRGS</b>	Technische Regeln für Gefahrstoffe (technical instructions for dangerous substances)
<b>UVC</b>	Substance of Unknown or Variable Composition, Complex reaction products
<b>UVCB</b>	Substance of Unknown or Variable Composition, Complex reaction products or Biological materials
<b>VLE-MP</b>	Exposure limit value - weighted average in mg by cubic meter of air
<b>vPvB</b>	Very persistent, very bioaccumulative

## 16.5 Main references to literature and information sources

- (1) Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006. Available from: <http://www.hse.gov.uk/pubns/web/portlandcement.pdf>
- (2) Observations on the effects of skin irritation caused by cement, Kietzman et al, *Dermatosen*, 47, 5, 184 - 189 (1999)
- (3) European Commission's Scientific Committee on Toxicology, Ecotoxicology and the Environment (SCTEE) opinion of the risks to health from Cr(VI) in cement (European Commission, 2002).  
[http://ec.europa.eu/health/archive/ph\\_risk/committees/sct/documents/out158\\_en.pdf](http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf).
- (4) Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr (VI) in cement, NIOH, Page 11, 2003
- (5) U. S. EPA, Short-term Methods for Estimation of 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 4<sup>th</sup> ed. EPA-821-R-02-013, US EPA, Office of Water, Washington D.C. (2002).



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- (6) U. S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 4th ed. EPA/600/4-90/002, Environmental Monitoring and Support Laboratory, U. S. EPA, Cincinnati, OH (1993) and 5<sup>th</sup> 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 voluntator* 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, Vas Berlo et al, Chem. Res. Toxicol., 2009 Sept; 22(9):1548-58.
- (13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial 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

## **16.6. Indication of changes / Revisions**

In the seventh version of the Safety Data Sheet, the content and formal requirements for Safety Data Sheets have been updated according to the applicable legislation.

## **16.7. Instructions regarding training**

In addition to training programs on occupational health and safety and environmental protection for their employees, companies must ensure that employees read, understand and apply this safety data sheet (SDS) requirements.

## **16.8. Scope of responsibility**

The information in this Safety Data Sheet reflects contemporary available knowledge and is reliable provided the product is used under the prescribed conditions and in accordance with intended uses mentioned on packages or in technical manuals/material data sheets. Any other use of this product including its use in combination with any other product or any other processes is the user's responsibility.



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So, the user is responsible for the determination of proper safety measures and for application of legislation covering his/her own activities.

## Annex to the Safety data sheet: Exposure scenarios

### Annex: Additional tables with engineering controls by individual protective measures for Chapter 8.2

Inhalation DNEL 5 mg/m<sup>3</sup> (Portland clinker)

#### 8.2.1 Appropriate Engineering Controls

Exposure scenario	PROC*	Exposure	Local management / local measures	Efficiency
Industrial production of hydraulic building and construction materials	2, 3	Length is not limited (up to 480 minutes per shift, 5 shifts per week)	not required	-
	14, 26		A) not required, or B) normal local exhaust	- 78%
			5, 8b, 9	A) not required, or B) normal local exhaust
Industrial use of dry hydraulic building and construction materials (internal, external)	2		not required	-
	14, 22, 26, 5, 8b, 9		A) not required, or B) normal local exhaust	- 78%
			5, 8b, 9	A) full / total ventilation or B) normal local exhaust
Industrial use of dry	7	A) not required, or	-	



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hydraulic suspensions of building and construction materials	2, 5, 8b, 9, 10, 13, 14	B) normal local exhaust	78%
		not required	-
Professional use of dry hydraulic building and construction materials (internal, external)	2	A) not required, or B) full / total ventilation or	- 29%
	9, 26	A) not required, or B) normal local exhaust	- 77%
	5, 8a, 8b, 14	A) not required, or B) normal local exhaust	- 72%
	19	Local measures are not applicable, only in well-ventilated rooms or outdoors.	50%
Professional use of wet hydraulic suspensions of building and construction materials	11	A) not required, or B) normal local exhaust	- 77%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-

\* PROCs are intended uses and they are defined in para. 1.2.

## 8.2.2 Individual protection measures, including personal protective equipment

Exposure scenario	PROC*	Exposure	Respiratory Protection Specification (RPE)	RPE efficiency - determined protection factor (APF)
Industrial production of hydraulic building and construction materials	2, 3	Length is not limited (up to 480 minutes per shift, 5 shifts per 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 (internal, external)	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 use of wet hydraulic suspensions building and construction materials	7		A) P2 mask (FF, FM) or B) not required	APF = 10 -
	2, 5, 8b, 9, 10,		not required	-





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	13, 14			
Professional use of dry hydraulic building and construction materials (internal, external)	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 A) P1 mask (FF, FM) or	APF = 20 APF = 4
	19		P2 mask (FF, FM) or	APF = 10
			A) P2 mask (FF, FM) or B) not required	APF = 10 -
Professional use of wet hydraulic suspensions of building and construction materials	11			
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

\* PROCs are intended uses and they are defined in para. 1.2.



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*Inhalation DNEL 1 mg/m<sup>3</sup> (dusts from Portland clinker production)*

## 8.2.1 Appropriate Engineering Controls

Exposure scenario	PROC*	Exposure	Local management / local measures	Efficiency
Industrial production of hydraulic building and construction materials	2, 3	Length is not limited (up to 480 minutes per shift, 5 shifts per week)	not required	-
	14, 26		A) not required, or B) normal local exhaust	- 78%
	5, 8b, 9		normal local exhaust	78%
Industrial use of dry hydraulic building and construction materials (internal, external)	2		not required	-
	14, 22, 26		A) not required, or B) normal local exhaust	- 78%
	5, 8b, 9		normal local exhaust	78%
Industrial use of wet hydraulic suspensions building and construction materials	7		A) not required, or B) normal local exhaust	- 78%
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction materials (internal, external)	2		A) not required, or B) normal local exhaust	- 72%
	9, 26		A) not required, or B) normal local exhaust	- 72%
	5, 8a, 8b, 14		normal local exhaust	72%
	19		Local measures are not applicable, only in well-ventilated rooms or outdoors.	50%
Professional use of wet hydraulic suspensions of building and construction materials	11	A) not required, or B) normal local exhaust	- 72%	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	

\* PROCs are intended uses and they are defined in para. 1.2.



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## 8.2.2 Individual protection measures, including personal protective equipment

Exposure scenario	PROC*	Exposure	Respiratory Protection Specification (RPE)	RPE efficiency - determined protection factor (APF)
Industrial production of hydraulic building and construction materials	2, 3	Length is 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 use of dry hydraulic building and construction materials (internal, external)	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 use of wet hydraulic suspensions of 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 (internal, external)	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 hydraulic suspensions 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 intended uses and they are defined in para. 1.2.