CEMENT SAFETY DATA SHEET

According to Regulation REACH (CE) No. 1907/2006 and subsequent modifications. According to "Guidelines for the safety data sheet template for common cements" approved by the CEMBUREAU in 2020.

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

1.1. Product identifier

Tipo Cemento	UFI	Fórmula estándar
CEM I 52,5 R	5S10-Y05U-900A-XNYN	Fórmula de Cemento Estándar-1
CEM I 52,5 R (ah)	5S10-Y05U-900A-XNYN	Fórmula de Cemento Estándar-1
CEM I 52,5 R-SR 5	5S10-Y05U-900A-XNYN	Fórmula de Cemento Estándar-1
CEM I 52,5 N-SR 5	5S10-Y05U-900A-XNYN	Fórmula de Cemento Estándar-1
CEM I 42,5 R	5S10-Y05U-900A-XNYN	Fórmula de Cemento Estándar-1
CEM II/A-P 52,5 R	J120-G081-600T-XPR1	Fórmula de Cemento Estándar-4
CEM II/B-M (P-LL) 42,5 R	QT20-10FK-Y008-WS08	Fórmula de Cemento Estándar-13
CEM II/B-M (P-L) 42,5 R	QT20-10FK-Y008-WS08	Fórmula de Cemento Estándar-13
CEM II/B-M (S-LL) 42,5 R	VD20-H00M-E00T-K22M	Fórmula de Cemento Estándar-8
CEM III/A 42,5 N	4V10-F0V7-K00U-M0JS	Fórmula de Cemento Estándar-2
CEM IV/A (P) 42,5 R-SR	J120-G081-600T-XPR1	Fórmula de Cemento Estándar-4
CEM IV/B (P) 32,5 N-SR	J120-G081-600T-XPR1	Fórmula de Cemento Estándar-4

1.2. Relevant identified uses of the mixture and uses advised against

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). See section 16.2 for more information regarding use descriptors and categories.

Any uses not mentioned above, are advised against.

1.3. Details of the supplier of the safety data sheet

Company name: CEMEX ESPAÑA OPERACIONES, S.L.U.
Full address: C/ Hernández de Tejada, 1. Madrid 28027. Spain.
Telephone number: (+34) 91 377 92 00
E-mail address: canal.cemex@cemex.com
Webb address: www.cemex.es

1.4. Emergency telephone number:

Spain Emergency telephone number: (+34) 91 562 04 20 NATIONAL POITON CENTER
Service is provided in the following language: Spanish, every day, 24 h.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

2.1.1. According to Regulation (EC) No 1272/2008 (CLP), the mixture is classified:

Hazard class	Hazard category	Hazard statements
Skin irritation	2	H315: Causes skin irritation
Serious eye damage/eye irritation	1	H318: Causes serious eye damage
Specific target organ toxicity single exposure	3	H335: May cause respiratory irritation

2.2. Label elements

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

Hazard pictogram:

Signal word:
Danger

Hazard statements:
H318 Causes serious eye damage
H315 Causes skin irritation
H335 May cause respiratory irritation

Precautionary statements:

P102	Keep out of reach of children.
P280	Wear protective gloves/protective clothing/eye protection/face protection
P305+P351+P338+P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISEN CENTRE or doctor/physician.
P302+P352+P333+P313	IF CONTACT WITH SKIN: Wash with plenty of soup and water. If skin irritation or rash occurs: Get medical advice/attention.
P261+P304+P340+P312:	Avoid breathing dust/spray. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTRE or doctor/physician if you fell unwell.

P501 Dispose of contents/container to adequate product waste site in accordance with local waste regulation.

Supplemental information:
Skin contact with wet cement, concrete or mortar may cause irritation, dermatitis or burns.
May cause damage to products made of aluminium or other non-noble metals.

When it is necessary the common cement contains reducing chromium VI that produced levels of soluble chromium (VI) to below 2mg/kg (0.0002%) verified by UNE EN 196-10 to fulfil with OM PRE/1954/2004 and Regulation (CE) No. 1907/2006 (European Parliament and Council or Europe), relating to registration, evaluation and authorization of Chemicals (REACH) (Annex XVII) and its subsequent modifications.

- Effectiveness period declared is:
  - Bags: Two months since packing date (storage conditions: unopened bags, in cool, dry conditions and protected from humidity, rain, draught and isolated of the ground).

  - Cement in bulk: One month since delivery document. It´s limited to the first cement manipulation by the user. Bulk cement should be stored in silos that are waterproof, dry clean and protected from contamination.

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).

Cement is either naturally low in soluble chromium VI or reducing agents have been added to control the levels of sensitising soluble chromium (VI) to below 2mg/kg according to legislation specified under Section 15. If the storage conditions are not adequate or if the period of effectiveness declared in the supplementary information in section 2.2 is exceeded. the effectiveness of the reducing agent may be decreased, and the cement may be skin sensitizing (H317).

SECTION 3: Composition / Information on ingredients

3.1. Substances

Not applicable as the product is a mixture, not a substance.

3.2. Mixtures

Cement is composed of different mix proportions of clinker, gypsum and other additional constituents, which are varied depending on the type of cement, according to the following table regulation: Standards UNE-EN 197-1:2011/UNE 80303-1:2017/UNE 80303-2:2017/UNE 80305:2002/UNE 80307:2001/UNE-EN 14.216:2015/ UNE-EN 413-1:2011.

ain types	Names of the 27 products (common cement types)		Composition (percentage by mass[a])										
			Main constituents										Minor Const.
			Clínker	Blast – furnace slag	Silica fume	Pozzolana		Fly ash		Burnt Shale	Limestone		
						Natural	Natural calcined	Siliceous	Calcareous				
			K	S	D[b]	P	Q	V	W	T	L	LL	
CEM I	Portland Cement	CEM I	95-100	-	-	-	-	-	-	-	-	-	0-5
CEM II	Portland Cement slag	CEM II/A-S	80-94	6-20	-	-	-	-	-	-	-	-	0-5
		CEM II/B-S	65-79	21-35	-	-	-	-	-	-	-	-	0-5
	Portland silica fume Cement	CEM II/A-D	90-94	-	6-10	-	-	-	-	-	-	-	0-5
	Portland pozzolana Cement	CEM II/A-P	80-94	-	-	6-20	-	-	-	-	-	-	0-5
		CEM II/B-P	65-79	-	-	21-35	-	-	-	-	-	-	0-5
		CEM II/A-Q	80-94	-	-	-	6-20	-	-	-	-	-	0-5
		CEM II/B-Q	65-79	-	-	-	21-35	-	-	-	-	-	0-5
	Portland fly ash Cement	CEMII/A-V	80-94	-	-	-	-	6-20	-	-	-	-	0-5
		CEM II/B-V	65-79	-	-	-	-	21-35	-	-	-	-	0-5
		CEM II/A-W	80-94	-	-	-	-	-	6-20	-	-	-	0-5
		CEM II/B-W	65-79	-	-	-	-	-	21-35	-	-	-	0-5
	Portland burnt shale Cement	CEM II/A-T	80-94	-	-	-	-	-	-	6-20	-	-	0-5
		CEM II/B-T	65-79	-	-	-	-	-	-	21-35	-	-	0-5
	Portland limestone Cement	CEM II/A-L	80-94	-	-	-	-	-	-	-	6-20	-	0-5
		CEM II/B-L	65-79	-	-	-	-	-	-	-	21-35	-	0-5
		CEM II/A-LL	80-94	-	-	-	-	-	-	-	-	6-20	0-5
		CEM II/B-LL	65-79	-	-	-	-	-	-	-	-	21-35	0-5
	Portland composite[c] Cement	CEM II/A-M	80-88	<---------- 12-20 ---------->									0-5
		CEM II/B-M	65-79	<---------- 21 -35 ---------->									0-5
CEM III	Blast furnace Cement	CEM III/A	35-64	36-65	-	-	-	-	-	-	-	-	0-5
		CEM III/B	20-34	66-80	-	-	-	-	-	-	-	-	0-5
		CEM III/C	5-19	81-95	-	-	-	-	-	-	-	-	0-5
CEM IV	Pozzolanic Cement[c]	CEM IV/A	65-89	-	<---------- 11-35 ---------->					-	-	-	0-5
		CEM IV/B	45-64	-	<---------- 36-55 ---------- >					-	-	-	0-5
CEM V	Composite Cement[c]	CEMV/A	40-64	18-30	-	<—------- 18-30 —-------->			-	-	-	-	0-5
		CEMV/B	20-38	31-49	-	<---------- 31-49 ---------->			-	-	-	-	0-5

a. Table values are refereed adding main constituents and additional minority constituents
b. Silica fume maximum 10%
c. Portland composite cements (CEM II/A-M and CEM II/B-M), pozzolanic cement (CEM IV/A and CEM IV/B) and composite cements (CEM V/A and CEM V/B), the clinker main different constituents should be declare in the cement designation.

a. The values in the table refer to the sum of the main and additional minority components, not including gypsum, (which is usually in a percentage of 3-6% of the total weight of the product).

Cement for Special uses:

Cement Type	Composition (percentage by mass [1])				
	Main constituents				
	Clínker	Blast – furnace slag	Natural Pozzolana [2]	Siliceous Fly ash	Minor constituents [3]
	K	S	P	V	
ESP VI-1	25-55	45-75			0-5

1) The table value refers to the cement nucleus except calcium sulphate and any additive.
2) The content of natural pozzolana must not be higher than 40%.
3) The additional minority constituent could be one or several of the principal components, if they are not included initially in the cement.

Main types	Names of the 6 products (very low heat moisturizing special cement types)		Composition (percentage by mass[a])							
			Main constituents							Additional minor constituents
			Clínker	Blast-furnace slag	Silica fume	Pozzolana		Fly ash		
						Natural	Natural calcined	Calcareous	Siliceous	
			K	S	D[b]	P	Q	V	W	
VLH III	Blast furnace Cement	VLH III/B	20-34	66-80	-	-	-	-	-	0-5
		VLH III/C	5-19	81-95	-	-	-	-	-	0-5
VLH IV	Pozzolanic Cement [c]	VLH IV/A	65-89	-	<---------- 11-35 ---------->					0-5
		VLH IV/B	45-64	-	<---------- 36-55 ---------->					0-5
VLH V	Composite Cement [c]	VLH V/A	40-64	18-30	-	<—------- 18-30 —-------->			-	0-5
		VLH V/B	20-38	31-49	-	<---------- 31-49 ---------->			-	0-5

a. Table values are refereed adding main constituents and additional minority constituents, without include plaster (the approximately content between 3-6% of the total weight)
b. Silica fume maximum 10%
c. Pozzolanic cements (VLH IV/A and VLH IV/B) and composite cements (VLH V/A and VLH V/B), the clinker main different constituents should be declare in the cement designation.

Cement for Building uses:

Cement Type	Composition (percentage by mass)	
	Cement Portland Clinker	Additives
MC 5	≥ 25	≤ 1 [a]
MC 12,5; MC 12,5 X MC 22,5; MC 22,5 X	≥ 40	
a) Organic additives quantity of the dry sample must not be higher than building cement mass		

Main types	Names of the 7 products (common cement types resistant to sulphates)		Composition (percentage by mass[a])				
			Main constituents				Additional minor constituents
			Clinker K	Blast-furnace slag S	Natural Pozzolana P	Siliceous fly ash V	
CEM I	Portland Cement resistant to sulphates	CEM I-SR 0 CEM I-SR 3 CEM I-SR 5	95-100	-	-	-	0-5
CEM III	Blast furnace Cement resistant to sulphates	CEM III/B-SR	20-34	66-80	-	-	0-5
		CEM III/C-SR	5-19	81-95	-	-	0-5
CEM IV	Pozzolanic Cement resistant to sulphates [b)]	CEM IV/A-SR	65-79	-	<---------- 21-35 --------->		0-5
		CEM IV/B-SR	45-64	-	<---------- 36-55 ---------->		0-5

a. Table values are refereed adding main constituents and additional minority constituents.
b. Pozzolanic Cements resistant to sulphates (CEM IV/A -SR and CEM IV/B-SR), the clinker main different constituents should be declared in the cement designation.

3.2.1. Cement ingredients hazardous to the environment and human health

Substance	Quantity (cement p/p)	Number of registry	CE Nº	CAS	According to Regulation 1272/2008	
					Hazard category, Hazard class	Hazard statements
Portland cement clinker	5-100%	Exempt registration	266-043-4	65997-15-1	STOT SE, respiratory tract irritation. cat 3	H335: May cause respiratory irritation
					Skin irritation. cat 2	H315: Causes skin irritation
					Serious eye damage/ eye irritation. cat 1	H318: Causes serious eye damage
					Skin sensitisation. cat 1B	H317: May cause an allergic skin irritation
					STOT SE, tract respiratory irritation. cat 3	H335: May cause respiratory irritation
					Serious eye damage/ eye irritation. cat 1	H318: Causes serious eye damage
Dust production cement clinker[1]	0,1-5%	01-2119486767-17-0028	270-659-9	68475-76-3	STOT SE, respiratory tract irritation. cat 3	H335: May cause respiratory irritation
					Skin irritation. cat 2	H315: Causes skin irritation
					Serious eye damage/ eye irritation. cat 1	H318: Causes serious eye damage
					Skin sensitisation. cat 1B	H317: May cause an allergic skin irritation

[1] *"Flue dust"*

SECTION 4: First aid measures

4.1. Description of first aid measures

General notes
No personal protective equipment is needed for first aid responders, unless it is in a dusty atmosphere, where gloves, safety glasses and mask will be used. Avoid contact with wet cement or mixtures and in addition of personal protective equipments mentioned before, use long sleeve shirt and pants.

Following eye contact
Do not rub eyes 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 (if possible, use physiological saline 0.9% NaCl), for at least 20 minutes to remove all particles. Avoid flushing particles into uninjured eye. Contact a specialist of occupational medicine or an eye specialist.

Following skin contact
For dry cement, remove and then 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 inhalation
Move the person to fresh air. Dust in throat and nasal passages should clear spontaneously. Look for medical attention if symptoms persist.

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

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

Eyes: Eye contact with 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 without adequate protection can cause dermatitis or severe burns.
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 information (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

When contacting a physician, take this safety data sheet with you.

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

5.3. Advice for fire-fighters

Cement poses no fire-related hazards. No need for special protective equipment for fire-fighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

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

6.1.2 For emergency responders

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

6.2. Environmental precautions

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 if possible.

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, UNE-EN 1822-1) or equivalent technique) which does not cause airborne dispersion. Never use compressed air.

Alternatively, wipe-up the dust by mopping, wet brushing or by using water sprays or hoses (fine mist to avoid that the dust becomes airborne) and remove slurry.

If not possible, remove by slurring with water (see wet cement).

When wet cleaning or vacuum cleaning is not possible and only removal with utensils is applicable, ensure that the workers wear the appropriate personal protective equipment and prevent dust from spreading through the use of suitable utensils, avoiding brushing.

Avoid inhalation of cement and contact with skin and eyes. 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 details.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

7.1.1 Protective measures

Follow the recommendations as given under Section 8.
To clean up 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, among which CEMBUREAU. These safe handling practices It can be found via the following link: http://www.nepsi.eu/agreement-good-practice-guide/good-practice-guide.aspx.

The Spanish cement industry voluntarily adopted the terms in the Agreement and has elaborated a protocol of application of this specific document of the Spanish cement sector. (http://www.oficemen.com/reportajePag.asp?id_rep=139)

Measure to protect the environment
No particular measures.

7.1.2 Information on general occupational hygiene

Do not handle or store near food and beverages or smoking materials.
In dusty environment, wear dust mask and protective goggles.
Use protective gloves to avoid skin contact.

7.2. Conditions for safe storage, 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: 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 security measures. Cement can build-up or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Packed products should be stored in unopened bags clear of the ground in cool, dry conditions and protected from excessive draught in order to avoid degradation of quality.
Bags should be stacked in a stable manner.

Do not use aluminium containers for the storage or transport of wet cement containing mixtures due to incompatibility of the materials.

7.3. Specific end use(s)

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

7.4. 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 dry weight of the cement, according to UNE-EN 196-10. They will also

indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent. This information can be consulted in section 2.2. (Supplementary information) and 7.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Name – Limit value	Limit type value	Value (8 h VLA)	Units	Legislation reference
Particles (non soluble or not much soluble)	Inhalable fraction, VLA-ED	10	mg/m³	Spain Chemical Agents Occupational Exposure List issued by Health and Safety National Institution
Particles (non soluble or not much soluble)	Respirable fraction, VLA-ED	3	mg/m³	ORDEN ITC/2585/2007 Spain Chemical Agents Occupational Exposure List issued by Health and Safety National Institution
Portland Cement	Respirable fraction, VLA-ED	4	mg/m³	Spain Chemical Agents Occupational Exposure List issued by Health and Safety National Institution
Crystalline silica	Respirable fraction, VLA-ED	0,1	mg/m³	Maximum Exposure Limit at the European Union level according to "Directive (EU) 2017/2398" The applicable limit in Spain will be the one that appears in Real Decreto 665/1997

8.2. Exposure controls

For each individual PROC, users can choose from either option A) or B) in the table above, 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 section "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*	Expo-sure	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 %
	2		not required	-

Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	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	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 material (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) generic local exhaust ventilation	- 87 %
	19		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) not required or B) generic local exhaust ventilation	- 72 %
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

8.2.2 Individual protection measures such as personal protection equipment

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.

Eye/face protection

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

Skin protection


Use watertight, wear- and alkali-resistant protective gloves (e.g. nitrile soaked cotton gloves with 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, respect the maximum wearing time to avoid skin problems.
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 or kneepads are necessary.

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 harmonized standard, (e.g. UNE EN 149 or national standard).

Thermal hazards
Not applicable.

Use	PROC*	Expo-sure	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 respiratory protective or B) not required	APF = 4 -
	5, 8b, 9		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) P1 respiratory protective or B) not required	APF = 4 -
	5, 8b, 9		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) P1 respiratory protective or B) not required	APF = 4 -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		P1 respiratory protective	APF = 4
	9, 26		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
	5, 8a, 8b, 14		A) P3 respiratory protective or B) P1 respiratory protective	APF = 20 APF = 4
	19		P2 respiratory protective	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

An overview of the APFs of different RPE (according to UNE 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.

8.2.3 Environmental exposure controls

Air: 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.

Water: Do not wash cement into sewage systems or into bodies of water, to avoid high pH. Above pH 9 negative ecotoxicological impacts are possible.

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

For further information, refer to Section 6 on ‘Accidental release measures’.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

This information applies to the whole mixture.

(a) Physical state: Dry cement is a finely ground solid inorganic material (powder). Main particle size: 5-30 µm
(b) Colour: grey
(c) Odour: Odourless
(d) Melting point/freezing point: Melting point: > 1250 °C
(e) Boiling point or initial boiling point and boiling range: Not applicable as under normal atmospheric conditions, melting point >1250°C
(f) Flammability (solid, gas): Not applicable as is a solid which is non-combustible and does not cause or contribute to fire through friction
(g) Upper/lower explosive limits: Not applicable as is not a flammable gas
(h) Flash point: Not applicable as is not a liquid
(i) Auto-ignition temperature: Not applicable (no pyrophoricity – no organo-metallic, organo-metalloid or organo-phosphine bindings or of their derivatives, and no other pyrophoric constituent in the composition)
(j) Decomposition temperature: Not applicable as no organic peroxide present
(k) pH: (T = 20°C in water, water-solid ratio 1:2): basic between 11 and 13.5
(l) Kinematic viscosity: Not applicable as not a liquid
(m) Solubility in water (T = 20 °C): slight (0.1-1.5 g/l)
(n) Partition coefficient: n-octanol/water: Not applicable as is inorganic mixture
(o) Vapour pressure: Not applicable as melting point > 1250 °C
(p) Density and/or relative density: 2.75-3.20 g/cm³ (T=20ºC); Apparent density: 0.9-1.5 g/cm³ (T=20ºC)
(q) Relative vapour density: Not applicable as is a solid
(r) Particle characteristics: Main particle size: 5-30 µm

9.2. Other information

Not applicable.

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 non-noble 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 as defined in Regulation (EC) No. 1272/2008

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	-	No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met.	(9)
Acute toxicity - oral	-	No indication of oral toxicity from studies with clinker kiln dust. Based on available data, the classification criteria are not met.	Literature survey
Skin corrosion/ irritation	2	Cement in contact with wet skin without appropriate personal protective equipment, may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns. Some individuals may develop eczema upon exposure to wet cement dust caused by the high pH which induces irritant contact dermatitis after prolonged contact.	(2) Human experience

Hazard class	Cat	Effect	Reference
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	-	Some individuals may develop eczema upon exposure to wet cement dust by an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis. If the cement contains a soluble Cr (VI) reducing agent and as long as the mentioned period of effectiveness of the chromate reduction is not exceeded, a chromatesensitising effect is not expected [Reference (3)]. Therefore, and according to the consultation published by ECHA, its classification is not considered appropriate.	(3), (4), (17)
Respiratory sensitisation	-	There is no indication of sensitisation of the respiratory system. Based on available data, the classification criteria are not met.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met.	(12), (13)
Carcinogenicity	-	No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen. Portland cement is not classifiable as a human carcinogen (According to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans, but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent with one of the other notations.). Based on available data, the classification criteria are not met.	(1) (14)
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience
Specific target organs toxicity (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)
Specific target organs toxicity (STOT)-repeated exposure	-	Long-term exposure to respirable cement dust above the exposure limit values can cause coughing, choking sensation, and chronic obstructive changes in the respiratory tract. Chronic effects have not been observed at low concentrations. 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 may aggravate existing respiratory system disease(s) and/or medical conditions such as emphysema or asthma and/or existing skin and/or eye conditions.

11.2 Information on other hazards

11.2.1. Endocrine disrupting properties

Not relevant

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 under certain circumstances.

12.2. Persistence and degradability

Not relevant. After hardening, cement presents no toxicity risks.

12.3. Bioaccumulative potential

Not relevant. After hardening, cement presents no toxicity risks.

12.4. Mobility in soil

Not relevant. After hardening, cement presents no toxicity risks.

12.5. Results of PBT and vPvB assessment

Not relevant. After hardening, cement presents no toxicity risks.

12.6. Endocrine disrupting properties

Not relevant.

2.7. Other adverse effects

Not relevant.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Do not dispose of into sewage systems or surface waters.

Product - cement that has exceeded its shelf life
EWC entry: 10 13 99 (wastes not otherwise specified)
(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
EWC entry: 10 13 06 (Other particulates and dust)
Pick up dry unused residue or dry spillage as is. Mark the containers. Possibly reuse depending upon effectiveness of the reducing agent (cement bags and delivery documents will contain the storage period) 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 the inertisation, concrete waste is not a dangerous waste.
EWC entries: 10 13 14 (waste from manufacturing of cement – waste concrete or concrete sludge) or 17 01 01 (construction and demolition wastes - concrete).

Packaging

Completely empty the packaging and process it according to local legislation.
EWC entry: 15 01 01 (wastepaper and cardboard packaging).

SECTION 14: Transport information

Cement is 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

Not relevant

14.2. UN proper shipping name

Not relevant

14.3. Transport hazard class(es)

Not relevant

14.4. Packing group

Not relevant

14.5. Environmental hazards

Not relevant

14.6. Special precautions for user

Not relevant

14.7. 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

EU regulatory information
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.10 of REACH).

The marketing and use of cement is subject to a restriction on the content of soluble Cr (VI) (REACH Annex XVII point 47 Chromium VI compounds:

1. “The cement and the mixtures that contain cement not will be able to use or to commercialize if, once hydrated, its chromium content (VI) soluble is higher than to 2 mg/kg (0,0002%) of total the dry weight of the cement.”

2. “When reducing agents are used, and without damage of the application of other Community regulations on classification, packaging and labelled of substances and mixtures, the suppliers will guarantee, before

the commercialization, that the cement package or the mixtures that contain cement, are identified visible, legible and indelible with information on the date of packaging, as well as on the conditions of storage and the time of storage adapted to maintain the activity of the reducing agent and the chromium content (VI) soluble below the indicated limit in point 1."

3. For a reason or purpose of exception, points 1 and 2 will not be applied to the commercialization and the use in controlled, closed processes and totally automated in which the cement and the mixtures that contain cement, only are handled by machines and in that any possibility of contact with the skin does not exist."

4. "The standard adopted by the European Committee for Standardization (CEN) to carry out tests on the content of water-soluble chromium (VI) in cement or in the mixture that contains it will be used as the test method to accredit conformity with the point 1."

State regulatory information
The marketing of cement is subject to restrictions on the content of Cr (VI) included in Order PRE / 1954/2004, equivalent to those specified in the REACH Regulation mentioned in the previous section.

Information in accordance with article 41 of the Occupational Risk Prevention Law.
In compliance with article 41 of Law 31/1995 on Occupational Risk Prevention, "Obligations of manufacturers, importers and suppliers", it is reported that the product may contain traces or impurities of crystalline silica (fine fraction), as well as traces (impurities) of hexavalent chromium and nickel. The possible contents of these substances are lower than the requirements for the classification of this product, in accordance with Regulation (EC) No. 1272/2008 and for the necessary information in section 3 of this Safety Data Sheet, in accordance with Regulation (EC) No. 1907/2006. Work that involves exposure to respirable crystalline silica dust generated in a work process, as well as hexavalent chromium and nickel substances, are included in different sections of Directive 2004/37 / EC, as amended by Directive (EU) 2017 / 2398, and consequently, they will be included in Real Decreto 665/1997. For this reason, where appropriate, the appropriate preventive measures must be adopted.

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out for this mixture.

SECTION 16: Other information

16.1 Indication of changes

This safety data sheet replaces the previous (Version 21 – 07/02/2023)

In section 1.1. Product identifier, the products affected by this Safety Data Sheet are modified.

16.2 Identified uses and use descriptors and categories

The table below gives an overview of all relevant identified uses of cement or cement containing hydraulic binders. All the uses have been grouped in these identified uses because of the specific conditions of exposure for human health and environment. For each specific use, a set of risk management measures or localised controls has been derived (see section 8) which need to be put in place by the user of cement or cement containing hydraulic binders to bring the exposure to an acceptable level.

PROC	Identified Uses - Use Description	Manufacture/ Formulation of	Professional/ Industrial use of
		building and construction materials	
2	Use in closed, continuous process with occasional controlled exposure.	X	X
3	Use in closed batch process.	X	X
5	Mixing or blending in batch process for formulation of mixtures and articles.	X	X
7	Industrial spraying.		X
8a	Transfer of substance or mixture from/to vessels/large containers at non-dedicated facilities.		X
8b	Transfer of substance or mixture from/to vessels/large containers at dedicated facilities.	X	X
9	Transfer of substance or mixture into small containers.	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 mixtures or articles by tabletting, compression extrusion, palletisation.	X	X
19	Hand-mixing with intimate contact and only PPE available		X
22	Potentially closed processing operations with minerals/metals at elevated temperature in industrial setting.		X
26	Handling of solid inorganic substances at ambient temperature.	X	X

16.3 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
CAS	Chemical Abstracts Service
CLP	Classification, labelling and packaging (Regulation (EC) No 1272/2008)
COPD	Chronic Obstructive Pulmonary Disease
DNEL	Derived no-effect level
EC50	Half maximal effective concentration
ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Chemical Substances
EPA	Type of high efficiency air filter
ES	Exposure scenario
EWC	European Waste Catalogue
FF P	Filtering facepiece against particles (disposable)
FM P	Filtering mask against particles with filter cartridge
GefStoffV	Gefahrstoffverordnung
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 GoodsLC50 Median lethal dose
MEASE	Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, http://www.ebrc.de/ebrc/ebrc-mease.php
MS	Member State
OELV	Occupational exposure limit value
PBT	Persistent, bio-accumulative and toxic
PNEC	Predicted no-effect concentration
PROC	Process category
RE	Repeated exposure
REACH	Registration, Evaluation and Authorisation of Chemicals
RPE	Respiratory protective equipment

SCOEL	Scientific Committee on Occupational Exposure Limit Values
SDS	Safety Data Sheet
SE	Single exposure
STP	Sewage treatment plant
STOT	Specific Target Organ Toxicity
TLV-TWA	Threshold Limit Value-Time-Weighted Average
TRGS	Technische Regeln für Gefahrstoffe
VLE-MP	Exposure limit value-weighted average in mg by cubic meter of air
vPvB	Very persistent, very bio-accumulative
w/w	Weight by weight
WWTP	Waste water treatment plant

16.4 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, July 2010 – unaudited draft approved

(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) Exposure to Thoracic Aerosol in a Prospective Lung Function Study of Cement Production Workers; Noto, H., et al; Ann. Occup. Hyg., 2015, Vol. 59, No. 1, 4–24.

(16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, http://www.ebrc.de/ebrc/ebrcmease.php.

(17) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

(18) 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.

16.5 Training advice

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

16.6 Further information

Not applicable

16.7. Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to Regulation (EC) No. 1272/2008	Classification procedure
Skin Irrit. 2, H315	on basis of test data
Eye dam. 1, H318	on basis of test data
STOT SE. 3, H335	Human experience

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, use it in the recommended period and for applying the legislation covering his/her own activities.

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

1. Inhalation DNEL of 1 mg/m³

8.2.1 Appropriate engineering controls

Use	PROC*	Expo-sure	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		generic local exhaust ventilation	78 %
Industrial uses 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 material (indoor, outdoor)	2		A) not required or B) generic local exhaust ventilation	- 72 %
	9, 26		A) not required or B) generic local exhaust ventilation	- 72 %
	5, 8a, 8b, 14		generic local exhaust ventilation	72 %
	19 *(#)*		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) not required or B) generic local exhaust ventilation	- 72 %
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

8.2.2 Individual protection measures such as personal protection equipment

Use	PROC*	Expo-sure	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) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
	5, 8b, 9		P2 respiratory protective	APF = 10
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
	5, 8b, 9		P2 respiratory protective	APF = 10
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) P3 respiratory protective or B) P2 respiratory protective	APF = 20 APF = 10
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) P2 respiratory protective or B) P1 respiratory protective	APF = 10 APF = 4
	9, 26		A) P3 respiratory protective or B) P2 respiratory protective	APF = 20 APF = 10
	5, 8a, 8b, 14		P3 respiratory protective	APF = 20
	19 (#)		P3 respiratory protective	APF = 20
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) P3 respiratory protective or B) P2 respiratory protective	APF = 20 APF = 10
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

2. Inhalation DNEL of 5 mg/m³

8.2.1 Appropriate engineering controls

Use	PROC*	Expo-sure	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 uses 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) not required 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 material (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		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses 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	-

* PROC's are identified uses and defined in section 16.2.

8.2.2 Individual protection measures such as personal protection equipment

Use	PROC*	Expo-sure	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 respiratory protective or B) not required	APF = 4 -
	5, 8b, 9		A) P2 respiratory protective or B) not required	APF = 10 -
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) P1 respiratory protective or B) not required	APF = 4 -
	5, 8b, 9		A) P2 respiratory protective or B) not required	APF = 10 -
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) P2 respiratory protective or B) not required	APF = 10 -
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		A) P1 respiratory protective or B) not required	APF = 4 -
	9, 26		A) P2 respiratory protective or B) not required	APF = 10 -
	5, 8a, 8b, 14		A) P3 respiratory protective or B) P1 respiratory protective	APF = 20 APF = 4
	19		P2 respiratory protective	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) P2 respiratory protective or B) not required	APF = 10 -
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.