



Cement Products - Safety Data Sheet

According to Regulation (EC) No 1907/2006 (REACH) as amended by Reg 453/2010

Product: Mannok - Portland Cement

Mannok - Portland Cement

As amended by Reg 453/2010

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

1.1. PRODUCT Portland Cement (CEM I)
Portland - Limestone Cement (CEM II/A-L)

Substance	EINECS	CAS
Portland cement clinker	266-043-4*	65997-15-1
Limestone	215-279-6	1317-65-3
Flue dust from production of cement clinker	270-659-9	68475-76-3
Pulverised Fly Ash	268-627-4	68131-74-8
Blastfurnace Slag	266-002-0	65996-69-2
Ferrous Sulphate	231-753-5	7782-63-0

1.2. RELEVANT IDENTIFIED USES OF SUBSTANCE OR 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. SUPPLIER Mannok Cement Ltd. (Mannok),
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1.4. EMERGENCY TELEPHONE +353 (0) 49 952 5200
Not available outside office hours.

2 HAZARDS IDENTIFICATION

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

Hazard Class	Hazard Category	Hazard Statements
Skin irritation	2	H315: Causes skin irritation
Serious eye damage/eye irritation	1	H318: Causes serious eye damage
Skin sensation	1B	H317: May cause allergic skin reaction
Specific target organ toxicity single exposure respiratory irritation	3	H335: May cause respiratory irritation



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2.2. LABEL ELEMENTS

According to Regulation (EC) No 1272/2008



HAZARD STATEMENTS

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

PRECAUTIONARY STATEMENTS

- P102 Keep out of reach of children
- 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 POISON CENTER or doctor/physician
- P302 & P352 & P333 & P313: IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention
- P261 & P304 & P340 & P312: Avoid breathing dust/fume/gas/mist/vapours/spray. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
- P501 Dispose of contents/container to licenced facility.

SUPPLEMENTAL INFORMATION

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

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).

The product contains chromate reducing agent. As a result, the content of soluble chromium (VI) is less than 2 ppm. If the storage conditions are not appropriate or the storage period is exceeded, the effectiveness of the reducing agent can diminish, and the cement can become skin sensitising (R43 resp. H317b or EUH203).

Cement dust may cause an allergic reaction in some individuals due to the water soluble Cr(VI) content.

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1. SUBSTANCES

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

3.2. MIXTURES

Common cement types according to the EN 197-1 standard:

Constituent	% Weight	REACH Reg. No.	EC No.	CAS No.	Classification according to 67/548/EEC	Classification according to (EC) No. 1272/2008 (CLP)	
Portland Cement clinker	5-100%	Exempted from registration	266-043-4	65997-15-1	Irritant: Xi R37 / R38 R41 R43	Skin Irrit. 2 Skin sens1B Eye Dam 1 STOT SE 3	H315 H317 H318 H335
Flue dust from production of cement clinker	0.1-5%	01-211948 6767-17-0051	270-659-9	68475-76-3	Irritant: Xi R37/R38 R41 R43	Skin Irrit. 2 Skin sens1B Eye Dam 1 STOT SE 3	H315 H317 H318 H335



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4 FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES

GENERAL NOTES	No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet cement or wet cement containing mixtures.
FOLLOWING CONTACT WITH EYES	Do not rub eyes in order to avoid possible cornea damage as a result of mechanical stress. Remove contact lenses if any. Incline head to injured eye, open the eyelid(s) widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for at least 20 minutes to remove all particles. Avoid flushing particles into uninjured eye. If possible, use isotonic water (0.9% NaCl). Contact a specialist of occupational medicine or an eye specialist.
FOLLOWING SKIN CONTACT	For dry cement, remove and rinse abundantly with water. For wet cement, wash skin with plenty of water. Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them. Seek medical treatment in all cases of irritation or burns.
FOLLOWING INHALATION	Move the person to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops or if discomfort, coughing or other symptoms persist.
FOLLOWING INGESTION	Do not induce vomiting. If the person is conscious, wash out mouth with water and give plenty of water to drink. Get immediate medical attention or contact the 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. Prolonged skin contact with wet cement or wet concrete may cause serious burns because they develop without pain being felt (for example when kneeling in wet concrete even when wearing trousers). For more details see Reference (1).
INHALATION	Repeat 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 SDS with you.



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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.

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 cleanup methods such as vacuum clean-up or vacuum extraction (Industrial portable units, equipped with high efficiency air filters (EPA and HEPA filters, EN 1822-1:2009) or equivalent technique) which do 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 dry cleaning with brushes can be done, ensure that the workers wear the appropriate personal protective equipment and prevent dust from spreading. Avoid inhalation of cement and contact with skin. Place spilled materials into a container. 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.



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7 HANDLING THE STORAGE

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

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

MEASURES TO PREVENT AEROSOL AND DUST GENERATION

Do not sweep. Use dry cleanup methods such as vacuum clean-up or vacuum extraction, which do not cause airborne dispersion.
For more information, refer to the practice guidelines adopted under the Social Dialogue Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it, by Employee and Employer European sectoral associations, including CEMBUREAU. These safe handling practices can be found via the following link:
<http://www.nepsi.eu/agreement-good-practice-guide/good-practice-guide.aspx>

MEASURE TO PROTECT 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).

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 ready for use, according to EN 196-10. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

Name - limit value	Limit value type	Value (as 8 h TWA)	Unit	Legal Reference
Portland Cement	OELV respirable dust	1	mg/M ³	Chemical agents CoP 2011



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8.2 EXPOSURE CONTROLS

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.

Exposure Scenario	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week); (#) < 240 min	Not required	-
	14, 26		A) Not required or B) Generic local exhaust ventilation	78%
	5, 8b, 9		Generic local exhaust ventilation	78%
Industrial 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 1.2.

Note: 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.



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8.2.2. 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 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. For the gloves, respect the maximum wearing time to avoid skin problems.



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 the relevant EN standard, (EN 149) or national standard.

THERMAL HAZARDS

Not applicable.



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Exposure Scenario	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week); (#) < 240 min	Not required	-
	14, 26		A) FFP2 or B) FFP1	APF = 10 APF = 4
	5, 8b, 9		FFP2	APF = 10
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		Not required	-
	14, 22, 26		A) FFP2 or B) FFP1	APF = 10 APF = 4
	5, 8b, 9		FFP2	APF = 10
Industrial uses of wet suspension of hydraulic building and construction materials	7		A) FFP3 or B) FFP2	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) FFP2 or B) FFP1	APF = 10 APF = 4
	9, 26		A) FFP3 or B) FFP2	APF = 20 APF = 10
	5, 8a, 8b, 14	FFP3	APF = 20	
	19 (#)	FFP3	APF = 20	
Professional uses of wet suspensions of hydraulic building and construction materials	11	A) FFP3 or B) FFP2	APF = 20 APF = 10	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	Not required	-	

* PROC's are identified uses and defined in section 1

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

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

The duration of work (compare with "duration of exposure" above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker's capability of using tools and of communicating are reduced during the wearing of RPE. For reasons as given above, the worker should therefore be (i) healthy (especially in view of medical problems that may affect the use of RPE), (ii) have suitable facial characteristics reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely. The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers.



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8.2.3. ENVIRONMENTAL EXPOSURE CONTROLS

Environmental exposure control for the emission of cement particles into air has to be in accordance with the available technology and regulations for the emission of general dust particles.

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 increased pH loadings. Above pH 9, negative eco-toxicological impacts are possible.
SOIL AND TERRESTRIAL ENVIRONMENT	No special emission control measures are necessary for the exposure to the terrestrial environment.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

This information applies to the whole mixture.

- (a) Appearance: Dry cement is a finely ground solid inorganic material (grey or white powder). Main particle size: 5-30 µm
- (b) Odour: Odourless
- (c) Odour threshold: No odour threshold, odourless
- (d) pH: (T = 20°C in water, water-solid ratio 1:2): 11-13.5
- (e) Melting point: > 1250 °C
- (f) Initial boiling point and boiling range: Not applicable as under normal atmospheric conditions, melting point >1250°C
- (g) Flash point: Not applicable as is not a liquid
- (h) Evaporation rate: Not applicable as is not a liquid
- (i) Flammability (solid, gas): Not applicable as is a solid which is non combustible and does not cause or contribute to fire through friction
- (j) Upper/lower flammability or explosive limits: Not applicable as is not a flammable gas
- (k) Vapour pressure: Not applicable as melting point > 1250 °C
- (l) Vapour density: Not applicable as melting point > 1250 °C
- (m) Relative density: 2.75-3.20; Apparent density: 0.9-1.5 g/cm³
- (n) Solubility(ies) in water (T = 20 °C): slight (0.1-1.5 g/l)
- (o) Partition coefficient: n-octanol/water: Not applicable as is inorganic mixture
- (p) 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)
- (q) Decomposition temperature: Not applicable as no organic peroxide present
- (r) Viscosity: Not applicable as not a liquid
- (s) Explosive properties: Not applicable. Not explosive or pyrotechnic. Not in itself capable by chemical reaction of producing gas at such temperature and pressure and at such a speed as to cause damage to the surroundings. Not capable of a self-sustaining exothermic chemical reaction.
- (t) Oxidising properties: Not applicable as does not cause or contribute to the combustion of other materials

9.2. OTHER INFORMATION

Not applicable



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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.



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11 TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Cat	Effect	Reference
Acute toxicity - dermal	-	Limit test, 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 cement kiln dust. Based on available data, the classification criteria are not met	Literature survey
Skin corrosion/irritation	2	Cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns.	(2) Human experience
Serious eye damage/irritation	1	Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128. Common cements contain varying quantities of Portland cement clinker, fly ash, blast furnace slag, gypsum, natural pozzolans, burnt shale, silica fume and limestone. Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact by larger amounts of dry cement or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns and blindness.	(10), (11)
Skin sensitisation	1B	Some individuals may develop eczema upon exposure to wet cement dust, caused either by the high pH which induces irritant contact dermatitis after prolonged contact, or 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 and is a combination of the two above mentioned mechanisms. 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 sensitising effect is not expected [Reference (3)].	(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). Based on available data, the classification criteria are not met.	(1) (14)
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience
STOT-single exposure	3	Cement dust may irritate the throat and respiratory tract. Coughing, sneezing, and shortness of breath may occur following exposures in excess of occupational exposure limits. Overall, the pattern of evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, evidence available at the present time is insufficient to establish with any confidence the dose-response relationship for these effects.	(1)
STOT-repeated exposure		There is an indication of COPD. The effects are acute and due to high exposures. No chronic effects or effects at low concentration have been observed. Based on available data, the classification criteria are not met.	(15)
Aspiration hazard	-	Not applicable as cements are not used as an aerosol.	



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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.

12 ECOLOGICAL INFORMATION

- 12.1. TOXICITY** The product is not hazardous to the environment. Eco-toxicological 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. PERSISTANCE AND DEGRADABILITY** 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
- 12.3. BIO-ACCUMULATIVE 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. OTHER ADVERSE EFFECTS** Not relevant.



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13 ECOLOGICAL INFORMATION

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 shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to "Product - after addition of water, hardened"

Product - slurries

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

Product - after addition of water, hardened

Dispose of according to the local legislation. Avoid entry into the sewage water system. Dispose of the hardened product as concrete waste. Due to 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 (waste paper and cardboard packaging).

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 Not relevant

14.7. TRANSPORT IN BULK ACCORDING TO ANNEX II OF MARPOL73/78 & THE IBC CODE Not relevant



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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. Cement and cement-containing mixtures shall not be placed on the market, or used, if they contain, when hydrated, more than 2 mg/kg (0.0002 %) soluble chromium VI of the total dry weight of the cement
2. If reducing agents are used, then without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of cement or cement-containing mixtures is visibly, legibly and indelibly marked with information on the packing date, as well as on the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below the limit indicated in paragraph 1.
3. By way of derogation, paragraphs 1 and 2 above shall not apply to the placing on the market for, and use in, controlled closed and totally automated processes in which cement and cement-containing mixtures are handled solely by machines and in which there is no possibility of contact with the skin.

15.2. CHEMICAL SAFETY ASSESSMENT

No chemical safety assessment has been carried out for this mixture by the supplier



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16 OTHER INFORMATION

16.1. INDICATION OF CHANGES

Version 6. Safety Data Sheet updated to according to Regulation (EC) No 1907/2006 (REACH) as amended by Regulation 453/2010.

16.2. IDENTIFIED USES AND USE DESCRIPTORS

The table below gives an overview of 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 Building and Construction Materials	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 preparations and articles	X	X
7	Industrial spraying		X
8a	Transfer of substance or preparation from/to vessels/large containers at non-dedicated facilities		X
8b	Transfer of substance or preparation from/to vessels/large containers a dedicated facilities	X	X
9	Transfer of substance or preparation 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 preparations or articles by tableting, compression extrusion, pelletisation	X	X
19	Hand-mixing with intimate contact and only PPE available		X
22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		X
26	Handling of solid inorganic substances at ambient temperature	X	X



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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 Commercial 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 Goods
MEASE	LC50 Median lethal dose 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).



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- (7) Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D.C., 2001.
- (8) Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.
- (9) TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.
- (10) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.
- (11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.
- (12) Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Van Berlo et al, Chem. Res. Toxicol., 2009 Sept; 22(9):1548-58.
- (13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.
- (14) Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008.
- (15) Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.
- (16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/ebrc/ebrc-mease.php>
- (17) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kare Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

16.5. RELEVANT R-PHRASES AND/OR H-STATEMENTS

R37/38 Irritating to respiratory system and skin

R41 Risk of serious damage to eyes

R43 May cause sensitisation by skin contact

R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation

16.6. 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.

16.7. FURTHER INFORMATION

The data and test methods used for the purpose of classification of common cements, are given or referred to in section 11.1.

16.8. CLASSIFICATION AND PROCEDURE USED TO DERIVE THE CLASSIFICATION FOR MIXTURES ACCORDING TO REGULATION (EC) 127/2008 [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
Skin sens. 1B, H317	Human experience
STOT SE. 3, H335	Human experience

16.9. DISCLAIMER

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