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

1.1 Product identifier

Micro-fine binder

Trade names

Dyckerhoff MIKRODUR Type P

Dyckerhoff MIKRODUR rock

1.2 Relevant identified uses of the 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 Details of the supplier of the safety data sheet

Company name: Dyckerhoff GmbH, Werk Neuwied

Full address: Postfach 1443
D - 56504 Neuwied

Telephone number: Plant laboratory +49 2631/808-228, Fax: +49 2631/808-302

E-mail address of person responsible for the SDS: marcus.paul@dyckerhoff.com

1.4 Emergency telephone number

Emergency telephone number: +49 6131 19240 (Poison Control Center Mainz)

Hours of operation: 24 h / 7 days

Service is provided in the following languages: German, English

SECTION 2: Hazards identification

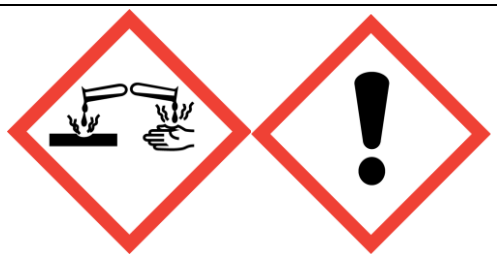
2.1 Classification of the substance or mixture

2.1.1 Classification 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
Specific target organ toxicity single exposure respiratory tract irritation	3	H335: May cause respiratory irritation

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard pictograms	
Signal word	Danger
Hazard statements	H315 Causes skin irritation H318 Causes serious eye damage 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. 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 appropriate waste collection point.
Supplemental informationen	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 sensitizing (H317 or EUH203).

SECTION 3: Composition/information on ingredients

3.1 Substances

Not applicable as the product is a mixture.

3.2 Mixtures

Hydraulic binder for grout injections.

Hazardous substances

Constituent	% (weight)	EINECS No.	CAS No.	REACH Registration No.	Classification Regulation (EC) No. 1272/2008 (CLP)	
Portland cement clinker	70 - 100	266-043-4	65997-15-1	exempted from registration	Skin Irrit. 2 Skin Sens. 1B Eye Dam. 1 STOT SE 3	H315 H317 H318 H335

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

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

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: 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 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 slurrying 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.

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 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, 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.

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)

This product is classified as GISCODE ZP1 (cement-based-products, low in chromate). GISCODE is a classification system agreed on in 1993 by manufacturers and German Builders' Trade Associations (GISBAU) for distinguishing product groups with certain common hazardous features. Further information at http://www.gisbau.de

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.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Name	Limit value	Limit peak value	Legal basis	Monitoring
General dust				
Exposure limit value (as 8 h TWA)	1.25 mg/m^3 (A) 10 mg/m^3 (E)	2 (II) – 15 min	TRGS 900	TRGS 402
Soluble chromium(VI)				
Condition of restriction	2 ppm in cement	not defined	Regulation (EC) No 1907/2006	EN 196-10

A = Alveolar respirable dust fraction

E = Inhalable dust fraction

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*	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 per week)	not required	-
	14, 26		A) not required or B) generic local exhaust ventilation	- 78 %
	5, 8b, 9		A) general ventilation or B) generic local exhaust ventilation	17 % 78 %
Industrial 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) general ventilation or B) generic local exhaust ventilation	17 % 78 %
Industrial uses of wet suspension of hydraulic building and construction materials	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) not required or B) generic local exhaust ventilation	- 78 %
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 cream 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

Repiratory 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, (e.g. EN 149, EN 140, EN 14387, EN 1827) or national standard.

Thermal hazards

Not applicable.

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency - assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a week)	not required	-
	14, 26		A) FFP1 or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 or B) FFP1	APF = 10 APF = 4
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) FFP1 or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 or B) FFP1	APF = 10 APF = 4
Industrial uses of wet suspension of hydraulic building and construction materials	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) FFP1 or B) not required	APF = 4 -
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		FFP1	APF = 4
	9, 26		A) FFP2 or B) FFP1	APF = 10 APF = 4
	5, 8a, 8b, 14		A) FFP3 or B) FFP1	APF = 20 APF = 4
	19		FFP2	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) FFP2 or B) FFP1	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 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

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 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.

SECTION 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.

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, managanese 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 toxicological effects

Hazard class	Cat.	Effect	Reference
Acute toxicity - dermal	-	Limit test, rabbit, 24 hours contact, 2000 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)
Akute 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 sensiti-sation	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)
Carcino-genicity	-	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)

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

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

Medical conditions aggravated by exposure

Inhaling cement dust may aggravate existing respiratory system disease(s) and/or medical conditions such as emphysema or asthma and/or existing skin and/or eye conditions.

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 as cement is an inorganic material. After hardening, cement presents no toxicity risks.

12.3 Bioaccumulative potential

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

12.4 Mobility in soil

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

12.5 Results of PBT and vPvB assessment

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

12.6 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 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).

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. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

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).

National legislation/requirements

German Regulations

- Class of danger to water: WGK 1 (self-classification)
- Storing classification according to TRGS 510: VCI-Lagerklasse 13 (None combustible solid materials)
- Hazardous Substances Ordinance (Gefahrstoffverordnung – GefStoffV)
- GISCODE: ZP 1 (cement-containing products, low in chromate)
- Occupational exposure limit values (TRGS 900)

15.2 Chemical Safety Assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information

16.1 Indication of changes

With respect to Version 2.0 in Section 3.2 Portland cement clinker and flue dust are classified as „Skin Sens. 1B“ instead of „Skin Sens. 1“. In Section 8.1 the new exposure limit value for the respirable fraction of general dust is listed. The exposure limit value for Portland cement is not listed anymore since it was deleted in TRGS 900. In addition, Sections 1.2, 1.4, 2.1, 2.2, 2.3, 3.1, 3.2, 7.3, 8.1, 8.2, 13.1, 15.1, 15.2 and 16 were edited.

16.2 Identified uses and use descriptors

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 building and construction materials	Professional/ Industrial use
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 tabletting, compression extrusion, pelletisation	**X**	**X**
19	Hand-mixing with intimate contact and only PPE available		**X**
22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		**X**
26	Handling of solid inorganic substances at ambient temperature	**X**	**X**

(b) 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 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, Authorisation and restriction 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

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(2) Observations on the effects of skin irritation caused by cement, Kietzman et al, Dermatosen, 47, 5, 184-189 (1999).

(3) European Commission's Scientific Committee on Toxicology, Ecotoxicology and the Environment (SCTEE) opinion of the risks to health from Cr(VI) in cement (European Commission, 2002). http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf.

(4) Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr(VI) in cement, NIOH, Page 11, 2003.

(5) U.S. EPA, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 3rd ed. EPA/600/7-91/002, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1994a) and 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (2002).

(6) U.S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, 4th ed. EPA/600/4-90/027F, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1993) and 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (2002).

(7) Environmental Impact of Construction and Repair Materials on Surface and Ground Waters. Summary of Methodology, Laboratory Results, and Model Development. NCHRP report 448, National Academy Press, Washington, D.C., 2001.

(8) Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.

(9) TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.

(10) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.

(11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.

(12) Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Van Berlo et al, Chem. Res. Toxicol., 2009 Sept; 22(9):1548-58.

(13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.

(14) Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008.

(15) Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.

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

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

16.5 Relevant hazard statements

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H318 Causes serious eye damage

EUH203 Contains chromium(VI). May produce an allergic reaction

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

See Annex(es) for the ES of the following substances:

Not applicable

16.8 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 irritation 2, H315	On the basis of test data
Eye damage 1, H318	On the basis of test data
Specific target organ toxicity - single exposure 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.