

Product: Cement, cementitious binders

Revised Version 4.1

Replaces all previous versions

Print date: 21/12/2022

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

1.1 Product identifier

Cement in accordance with DIN EN 197 and DIN 1164

Portland cement CEM I	UFI: 5S10-Y05U-900A-XNYN
Portland-slag cement CEM II/B-S	UFI: 4V10-F0V7-K00U-M0JS
Blast furnace cement CEM III/A	UFI: 4V10-F0V7-K00U-M0JS
Portland-limestone cement CEM II/A-LL	UFI: E920-00A7-4009-XQGG
Portland-fly ash cement CEM II/B-V	UFI: V420-Y0XE-H00A-K1A5

Hydraulic road binder according to DIN EN 13282

Hydraulic road binder HRB	UFI: HM21-7UDY-VQ2X-6FKT
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Special binder

Special binder RockWITT	UFI: NH21-QUQK-KQ2F-H4OP
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1.2. Relevant identified uses of the substance or mixture and uses advised against

Cements/binding agents are directly applied or used in industrial installations to manufacture/formulate hydraulic products, such as ready-mixed concrete, dry mortar, plasters, etc..

In the final application, cements/binding agents and hydraulic products made from them are used for the manufacturing of building materials and structural components both by industrial and professional users (professionals in the building sector) as well as by private end consumers. For this purpose, cements and cement-containing hydraulic binding agents are mixed with water, homogenized, and manufactured into the desired building material and component. Related activities include the handling of dry materials (powder) and of materials mixed with water (suspension). For more information regarding use descriptors and categories, see section 16.

1.3. Details of the supplier of the safety data sheet

Portlandzementwerk Wittekind Hugo Miebach Söhne KG
Hüchtchenweg 1
D-59597 Erwitte
Telephone number: +49 (0)2943/893-0
E-mail address of person responsible for the SDS: info@wittekindzement.de
Information provided by: Quality Control: Telephone number: +49 (0)2943/893-0

1.4. Emergency telephone number

Emergency telephone number: +49 (0)6131/19240 (Poison Information Center in Mainz, Germany)
Opening hours: 24 hours / 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 [CLP]

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.

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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

- P280 Wear protective gloves/protective clothing/eye 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.
- If the product is offered or sold to the general public, additionally:*
- P102 Keep out of reach of children.
 - P501 Dispose of contents/container to suitable waste collection points.

Supplementary information

If cement comes into contact with water or cement gets wet, a strongly alkaline solution will be formed. This solution can cause skin and eye irritation as well as dermatitis or serious skin damage.

2.3. Other hazards

Cement/binder and its components does not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation (EC) No 1907/2006) nor do they exhibit endocrine disrupting properties.

Product contains chromate reducing agent. As a result, the cement/binder contains less than 0.0002% of water-soluble Chromium(VI). If the storage conditions are not appropriate (exposure to humidity) or the storage period is exceeded, the effectiveness of the present reducing agent can diminish prematurely, and the cement/binder can become skin sensitizing (H317 or EUH203, respectively). On the delivery note or on the bag, it is indicated for how many months after consignment date the product will remain low-chromate in case of appropriate, dry storage.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable as the product is a mixture.

3.2. Mixtures

Cement/standard cements according to DIN EN 197 and DIN 1164, hydraulic road binder according to DIN EN 13282, special binder RockWITT or, where applicable, binding agent according to approval notification by Deutsches Institut für Bautechnik.

Substance name	Concentration range [M.-%]	EG-No.	CAS-No.	REACH Registration No.	Classification according to Regulation (EC) No. 1272/2008 (CLP)		SLC/ M-Faktor/ ATE
					Skin Irrit. 2	H315	
Portland cement clinker	5 - 100	266-043-4	65997-15-1	(a)	Skin Sens. 1B Eye Dam. 1 STOT SE 3	H317 H318 H335	Not applicable.
Flue Dust (b)	0,1 - 50	270-659-9	68475-76-3	01-2119486767-17-xxxx	Skin Irrit. 2 Skin Sens. 1B Eye Dam. 1 STOT SE 3	H315 H317 H318 H335	Not applicable.

- (a) Portland cement clinker is, according to Art. 2.7(b) and Annex V.10 of Regulation (EC) No. 1907/2006 (REACH), exempt from the registration requirement.
- (b) Flue dust is a substance (UVCB), arising from production of cement clinker; other conventional names are cement kiln dust, bypass dust, bypass meal, filter dust, ESP dust, clinker dust and clinker meal.

SECTION 4: First aid measures

4.1. Description of first aid measures

General notes

No special personal protective equipment is required for first aiders. First aiders should, however, avoid contact with wet cement/binding agents.

Following eye contact

Do not rub eyes dry, because mechanical stress may cause additional damage to the cornea. Where applicable, remove contact lenses and immediately rinse the eye, while open, under running water for at least 20 minutes in order to remove all particles. If possible, use isotonic eye-cleansing solution (0.9 % NaCl). Always consult an occupational physician or ophthalmologist.

Following skin contact

Remove dry cement/binding agent and rinse abundantly with water. Rinse wet cement/binding agent with plenty of water. Remove contaminated clothing, footwear, watches, etc. and clean these thoroughly before re-using them. Seek medical treatment in all cases of irritation or burns.

Following inhalation

Seek fresh air. Dust should quickly be removed from throat and nose. Consult a physician, should symptoms such as discomfort, coughing or persistent irritation occur.



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 poison information center.

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

Eyes: Eye contact with cement/binder agents (dry or wet) may cause serious and potentially irreversible eye damage.

Skin: Sustained contact with cement/binding agents may cause irritation on damp skin (due to sweating or humidity). Contact of cement/binding agents with damp skin may cause skin irritation, dermatitis, or severe skin damage. For more details see reference (1).

Inhalation: Repeated inhalation of large amounts of cement/binding agent dust over a long period of time increases the risk of developing lung diseases.

Environment: Under normal use, cement/binding agents are 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: Firefighting measures

5.1. Extinguishing media

Cements/binders agents are not flammable.

5.2. Special hazards arising from the substance or mixture

Cements/binders agents are non-combustible and non-explosive and will not facilitate or sustain the combustion of other materials.

5.3. Advice for firefighters

No special measures are required, as cement/binding agents do not pose any fire-related hazards.

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 in section 8. Follow the advice for safe handling and use given in section 7.

6.1.2 For emergency responders

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

6.2. Environmental precautions

Cement/binding agents should not penetrate the sewage water system, surface water or groundwater.

6.3. Methods and material for containment and cleaning up

Dry cement

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Absorb spilled cement/binding agent and reuse, if possible. Where possible, use dry methods to clean, such as vacuum exhaust (portable devices with highly efficient filter systems (EPA and HEPA filters, EN 1822-1:2009) or equivalent techniques), which do not generate dust formation. Never use compressed air for cleaning.

If dust is formed applying a dry cleaning method, personal protective equipment must be used.

Avoid inhalation of cement/binding agent dust and skin contact. Place spilled material into a container for potential subsequent use.

Wet cement

Clean up wet cement/binder 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/binder agent, see Subsection 6.3.

Measures to prevent fire

Not applicable.

Measures to prevent aerosol and dust generation

Do not sweep. Where possible, use dry methods for cleaning, such as vacuum exhaust, which do not generate dust formation.

Further information about preventing dust formation is provided by DGUV:

<https://www.dguv.de/staub-info/zehn-goldene-regeln/index.jsp> as well as on the NePSi platform: <https://guide.nepsi.eu/>.

Measure to protect the environment

No particular measures required.

7.1.2 Advice on general occupational hygiene

Do not eat, drink, or smoke when working. Wear dust respirator and protective goggles in dusty environment. Use protective gloves to avoid skin contact.

7.2. Conditions for safe storage, including any incompatibilities

Cement/binding agents should be stored under dry (minimizing internal condensation), water-protected conditions, clean and protected from contamination.

Do not enter storage areas for cement/binding agents such as silos, tanks, silo vehicles or other containers without suitable safety measures, because there is a danger of being buried and suffocated. In such confined spaces, cement/binding agent can form walls and bridges, which can, however, collapse or fall unexpectedly.

Do not use aluminum containers due to incompatibility of the materials

For cement/binding agents containing Chromium(VI) reducing agents (see section 15), please note that the effectiveness of the reducing agent diminishes over time and a sensitizing effect of cement/binding agents upon skin contact cannot be excluded (see section 2.3).

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These products are assigned to GISCODE ZP 1 (cement-containing products, low chromate, see also section 15). Further information about safe handling, protective measures and rules of conduct can be gathered from GISCODE ZP 1. It is available as part of the hazardous substance information system of the Occupational Insurance Association of the Construction Industry at <http://www.gisbau.de>.

Storage class: VCI storage class 13 (non-flammable solids).

7.3. Specific end use(s)

No additional information for the specific end uses.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Type of Evaluation Value	Evaluation Value	Peak Limitation	Source	Monitoring procedure, e.g.
General Dust Limit Value				
Maximum Allowable Concentration	8 h 1,25 mg/m ³ (A) 10 mg/m ³ (E)	2(II) 15 min 20 (E)	TRGS 900	TRGS 402
Water-soluble Chromium(VI)				
Restriction Condition	2 ppm in cement	Not determined.	Regulation (EC) No. 1907/2006	EN 196-10
Quartz respirable dust				
Restriction Condition	0,05 mg/m ³ (A)	overshoot factor 8	TRGS 900	-

A = Alveolar respirable dust fraction

E = Inhalable dust fraction

* must be taken into account if the quartz content is higher than 4%, as compliance with the general dust limit value is then no longer sufficient

Information on the Technical Rules for Hazardous Substances (TRGS) in (2)

8.2. Exposure controls

To comply with occupational exposure limits, combinations of technical and/or individual protective measures are often required. If no adequate workplace measurements are available for exposure, an exposure assessment and selection of appropriate protective measures based on the MEASE tool (Reference 3) may be carried out. Engineering controls (Table in 8.2.1) and individual protective measures (Table in 8.2.2) are recommended for the identified uses in the professional sector (subsection 16). In this context, option A can only be combined with A, and B can only be combined with B. Furthermore, it must be taken into consideration that the indications apply to a continuous exposure of 8 hours per day and 5 days per week.

For the private end consumer applies that the products shall only be used outdoors or in well-ventilated rooms and that personal protective equipment shall be worn (general indications in subsection 8.2.2).



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8.2.1 Appropriate engineering controls

Measures to prevent formation and spreading of dust, for example suitable ventilation systems and cleaning methods, which do not stir up dust.

Exposure Scenario	PROC*	Exposure	Technical Installation	Efficiency
Industrial manufacture/formulation of hydraulic building agents 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) local exhaust ventilation	- 78 %
	5, 8b, 9		A) general ventilation or B) local exhaust ventilation	17 % 78 %
Industrial uses of dry hydraulic building agents and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) not required or B) local exhaust ventilation	- 78 %
	5, 8b, 9		A) general ventilation or B) local exhaust ventilation	17 % 78 %
Industrial use of wet suspensions of hydraulic binding agents and building materials (indoor, outdoor)	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) not required or B) local exhaust ventilation	- 78 %
Professional use of dry hydraulic binding agents and building materials (indoor, outdoor)	2		not required	-
	9, 26		A) not required or B) local exhaust ventilation	- 72 %
	5, 8a, 8b, 14		A) not required or B) local exhaust ventilation	- 87 %
	19		Exhaust ventilation is not required, but process only in well-ventilated rooms or outdoors.	-
Professional use of wet suspensions of hydraulic binding agents and building materials (indoor, outdoor)	11	A) not required or B) local exhaust ventilation	- 72 %	
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-	



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*Defined in section 16

8.2.2 Individual protection measures, such as personal protection equipment

General information: Do not eat, drink, or smoke when working. Wash hands and if necessary, shower before breaks and after work to remove adherent cement/binding agent. Avoid contact with eyes and skin. After working with cement/binding agent, workers should wash or shower and use skin care products. Clean contaminated clothing, footwear, watches, etc. thoroughly before re-using them.

Eye/face protection



Use tight-fitting safety goggles according to EN 166 where dust is formed or in case of risk of spilling.

Skin protection



Wear waterproof, abrasion, and alkali-resistant gloves. Leather gloves are not suitable due to their water penetrability and can release chromate containing compounds. For handling cement/binders, special gloves for chemicals (Cat. III) are not required. Investigations have proven that nitrile impregnated cotton gloves (layer thickness of about 0.15 mm) provide sufficient protection over a period of 480 minutes. Change soaked gloves. Have spare gloves ready. General information about skin protection can be found in Rule 112-195 of the German Accident Prevention & Insurance Association (DGUV).

Wear tight footwear and long-sleeved clothing. If contact with moist cement/binder cannot be avoided, protective clothing should also be waterproof. Take care that no moist cement/binder is running in shoes or boots from above. Observe skin protection plan. Apply skin care products, in particular after work.

Respiratory protection



Use adequate respirator masks when there is a risk that exposure limit values are exceeded (e.g. during open handling of dry powder products). General information about respiratory protection can be found in Rule 112-190 of the German Accident Prevention & Insurance Association (DGUV).

Mixing and transferring dry cement/binder in open systems, e.g. manual mixing of cement paste or cement mortar, transferring bagged products to batch mixers: If compliance with maximum allowable concentrations cannot be guaranteed by dust-limiting measures, e.g. local exhaust ventilation, particle-filtering half-masks of the type FFP (according to EN 149) must be used (see table).

Exposure Scenario	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency-assigned protection factor (APF)
Industrial manufacture/formulation of hydraulic building agents and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts a	not required	-
	14, 26		A) FFP1 or B) not required	APF = 4
	5, 8b, 9		A) FFP2 or	APF = 10



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Exposure Scenario	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency-assigned protection factor (APF)
			B) FFP1	APF = 4
			not required	-
Industrial uses of dry hydraulic building agents and construction materials (indoor, outdoor)	2		A) FFP1 or B) not required	APF = 4 -
	14, 22, 26		A) FFP2 or B) FFP1	APF = 10 APF = 4
	5, 8b, 9		not required	-
Industrial uses of wet suspension of hydraulic building agents and construction materials (indoor, outdoor)	2, 5, 8b, 9, 10, 13, 14		A) FFP1 or B) not required	APF = 4 -
	7		FFP1	APF = 4
Professional use of dry hydraulic building agents and construction material (indoor, outdoor)	2		A) FFP2 oder B) FFP1	APF = 10 APF = 4
	9, 26		A) FFP3 oder B) FFP1	APF = 20 APF = 4
	5, 8a, 8b, 14		FFP2	APF = 10
	19		A) FFP1 oder B) not required	APF = 4 -
Professional uses of wet suspensions of hydraulic building agents and construction materials (indoor, outdoor)	11		not required	-
	2, 5, 8a, 8b, 9, 10, 13, 14, 19			

* Definition in Section 16

For **manual and mechanical handling of ready-made cement paste, cement mortar and concrete**, respiratory protective equipment is not required.

An instruction of employees on the appropriate application of the personal protection equipment is essential in order to guarantee the required effectiveness.

8.2.3 Environmental exposure controls

Air: Compliance with dust emission limit values in accordance with the Technical Instructions on Air Quality.



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Water: Do not discharge cement/binding agents into groundwater or wastewater systems in larger quantities. An increase in pH value is possible through exposure. At a pH value above 9, ecotoxicological effects may occur. Water directed or drained off into the wastewater system or surface water should therefore not lead to such a relevant pH value. Wastewater and groundwater regulations must be observed.

Soil: Compliance with the German Federal Soil Protection Act (BBodSchG) and the German Federal Soil Protection and Contamination Ordinance (BBodSchV). No special control measures required.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- (a) Physical state: Dry cement is a finely ground solid inorganic material.
- (b) Color: grey or white powder
- (c) Odor: Odorless
- (d) Melting point/freezing point: > 1250 °C
- (e) Boiling point or initial boiling point and boiling range: Not applicable, as under normal atmospheric conditions the melting point is above 1250 °C.
- (f) Flammability: Not applicable, as material is not combustible.
- (g) Lower and upper explosion limit: Do not apply to solids.
- (h) Flash point: Does not apply to solids.
- (i) Auto-ignition temperature: Not applicable, only applies to gases and liquids.
- (j) Decomposition temperature: Not applicable, as not self-reactive and no organic peroxides present.
- (k) pH (T = 20 °C in water, water-solid ratio 1:2): 11-13.5
- (l) Kinematic viscosity: Not applicable, only applies to liquids.
- (m) Solubility: in water (T = 20 °C): low (0.1-1.5 g/l)
- (n) Partition coefficient n-octanol/water (log value): Not applicable, as it is an inorganic mixture.
- (o) Vapor pressure: Not applicable, as melting point > 1250 °C.
- (p) Density and/or relative density: 2.75-3.20 g/cm³; bulk density: 0.9-1.5 g/cm³
- (q) Relative vapor density: Not applicable, only applies to gases and liquids.
- (r) Particle characteristics: Typical average particle size: 5-30 µm

9.2. Other information

Not applicable.

9.2.1 Information with regard to physical hazard classes

Not applicable.

9.2.2 Other safety characteristics

Not applicable.

SECTION 10: Stability and reactivity

10.1. Reactivity

Cement/binding agent is a hydraulic material. When mixed with water, an intended reaction takes place. As a result, cement hardens and forms a solid mass, which does not react with its environment.

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10.2. Chemical stability

Cement/binding agent is stable, as long as it is properly stored (see section 7). It should be kept dry. Contact with incompatible materials should be avoided. Wet cement/binding agent is alkaline and incompatible with acids, ammonium salts, aluminum, and other base metals. Here, hydrogen can be formed. Cement/binding agent dissolves in hydrofluoric acid, forming corrosive silicon tetrafluoride gas. Avoid contact with these incompatible materials.

With water, cement/binding agent forms calcium silicate hydrates, calcium aluminate hydrates and calcium hydroxide.

The calcium silicates of the cement/binding agent may react with strongly oxidizing agents such as fluorides.

10.3. Possibility of hazardous reactions

Not applicable.

10.4. Conditions to avoid

Moisture during storage can lead to lumping and loss of product quality.

10.5. Incompatible materials

Acids, ammonium salts, aluminum, or other base metals. Uncontrolled use of aluminum powder in wet cement should be avoided as hydrogen is produced.

10.6. Hazardous decomposition products

Cement/binding agent does not decompose into hazardous components.

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.	(4)
Acute toxicity- inhalation	-	Limit test, rat, with 5 g/m ³ , no acute toxicity. Study was conducted with Portland cement clinker, the main component of cement. Based on available data, the classification criteria are not fulfilled.	(10)
Acute toxicity - oral	-	No acute oral toxicity was found in animal studies with cement kiln dusts and cement dusts. Based on available data, the classification criteria are not fulfilled.	Literature survey
Skin corrosion/ irritation	2	Cement has an irritating effect on skin and mucous membranes. Dry cement in contact with moist skin or skin in contact with damp or wet cement can lead to various irritating and inflammatory skin reactions, e.g. redness and chaps. Prolonged contact in combination with mechanical abrasion may cause severe skin damages.	(4) and human experience
Serious eye damage/irritation	1	In the in vitro test, Portland cement clinker (the main component of cement) showed varying degrees of impact on the cornea. The calculated "irritation index" was 128. Direct contact with cement can lead to cornea damage, due to either an immediate or delayed irritation or inflammation, or the mechanical stress. Direct contact with large amounts of dry cement or splashes of wet cement may have effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to serious eye damage and blindness.	(10), (11) and human experience

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Hazard class	Cat.	Effect	Reference
Skin sensitisation	1B	Some individuals may develop eczema upon exposure to wet cement, caused 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 indicated period of effectiveness of chromate reduction is not exceeded, an allergic sensitizing effect is not expected and a labelling with H317 is not necessary.	(5), (13), (18), (19)
Respiratory sensitisation	-	There is no indication of respiratory sensitization system. Based on available data, the classification criteria are not fulfilled.	(1)
Germ cell mutagenicity	-	No indication of germ cell mutagenicity. Based on available data, the classification criteria are not fulfilled.	(14), (15)
Carcinogenicity	-	A causal relationship between cement exposure and cancer has not been determined. Epidemiological studies were not indicative of a connection between exposure to cement and cancer. Portland cement is not classified as a human carcinogen according to ACGIH A4: "Agents causing concern that they could be carcinogenic for humans but cannot be assessed conclusively because of a lack of data. In vitro tests or animal experiments do not provide sufficient evidence of carcinogenicity to assign this substance to another classification." Portland cement contains more than 90% Portland cement clinker. Based on available data, the classification criteria are not fulfilled.	(1) (16)
Reproductive toxicity	-	Based on available data, the classification criteria are not fulfilled.	No evidence from human experience
Specific target organ toxicity (STOT) – single exposure	3	Cement dust exposure can lead to irritation of the respiratory system (throat, neck, lungs). Coughing, sneezing, and shortness of breath can be the result if the exposure is above the occupational exposure limit. Occupational exposure to cement dust can lead to impairment of respiratory functions. However, currently there is insufficient evidence to deduce a dose-effect relationship.	(1)
Specific target organ toxicity (STOT) – repeated exposure	-	Long-term exposure to respirable cement dust above the occupational exposure limit may cause coughing, shortness of breath and chronic obstructive changes in the respiratory tract. No chronic effects have been observed at low concentrations. Based on available data, the classification criteria are not fulfilled.	(17)
Aspiration hazard	-	Not applicable, as cement/binder is not available as an aerosol.	

Apart from skin sensitization, Portland cement clinker and (common) cements/binding agents have the same toxicological and eco-toxicological properties.

Medical conditions aggravated by exposure

Cement/binding agent may aggravate existing skin, eye, and respiratory tract diseases, for example emphysema or asthma.

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Not applicable.

11.2.2. Other information

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Not applicable.

SECTION 12: Ecological information

12.1. Toxicity

Cement/binding agents are not considered hazardous to the environment. Ecotoxicological studies with Portland cement on *Daphnia magna* (U.S. EPA, 1994a) [Reference (6)] and *Selenastrum coli* (U.S. EPA, 1993) [Reference (7)] have shown little toxicological impact. Therefore, LC50 and EC50 values could not be determined [Reference (8)]. No toxic effects on sediments were determined either [Reference (9)]. The release of large amounts of cement in water can, however, lead to rise in pH and thus be toxic for aquatic life under certain circumstances.

12.2. Persistence and degradability

Not applicable, as cement/binding agent is an inorganic mineral material. After hydration, residual cement/binding agents present no toxicological risk.

12.3. Bioaccumulative potential

Not applicable, as cement/binding agent is an inorganic mineral material. After hydration, residual cement/binding agents present no toxicological risk.

12.4. Mobility in soil

Not applicable, as cement/binding agent is an inorganic mineral material. After hydration, residual cement/binding agents present no toxicological risk.

12.5. Results of PBT and vPvB assessment

Not applicable, as cement/binding agent is an inorganic mineral material. After hydration, residual cement/binding agents present no toxicological risk.

12.6. Endocrine disrupting properties

Not applicable.

12.7. Other adverse effects

Not applicable.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product exceeding the effective date of the reducing agent

(and if its content of water-soluble Chromium(VI) is higher than 0.0002%): The product must not be used or placed on the market anymore, except it is used in well-controlled, closed and fully automated processes or it is retreated with Chromium(VI) reducing agent.

Unused residual amount of dry product

Gather dryly. Label container. If possible, reuse material, avoiding dust exposure and observing date of expiry. In case of disposal, cure with water and dispose of as described under "Products cured after water addition". Waste code according to EWC (European Waste Catalogue): 10 13 06 (Other particulates and dust).

Moist products and product sludge

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Let moist products and product sludge cure. Do not dispose of in wastewater or surface water. Dispose of as described under "Products cured after water addition".

Products cured after water addition

Dispose of in strict accordance with local official directives. Do not dispose of in the sewage water system. Dispose of the cured products like of concrete waste and concrete sludge. Waste code according to EWC (European Waste Catalogue), depending on the source: As 17 01 01 (concrete) or 10 13 14 (waste concrete and concrete sludge).

Packaging

Empty packaging completely and recycle. Otherwise, dispose of the completely emptied packaging according to waste code EWC: 15 01 01 (paper and cardboard packaging) or 15 01 05 (composite packaging).

SECTION 14: Transport information

Cement/binding agent is not subject to the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID). Therefore, no dangerous goods classification is required.

14.1. UN number or ID number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

Not applicable.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Not applicable.

14.6. Special precautions for user

Not applicable.

14.7. Transport Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

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

EU Regulatory Information

Restrictions on use:

According to Annex XVII Paragraph 47 of Regulation (EC) 1907/2006 (REACH), the marketing and use of cements and cement-containing preparations is subject to restriction:

1. Cement and cement-containing mixtures shall not be placed on the market, or used, if they contain,

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- 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 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.
 4. The standard adopted by the European Committee for Standardization (CEN) for testing the watersoluble Chromium(VI) content of cement and cement-containing mixtures shall be used as the test method for demonstrating conformity with paragraph 1.

Within the scope of the "Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products containing it", manufacturers of cement have committed themselves to implement "Best Practices" for safe handling (<https://guide.nepsi.eu/>).

National legislation/requirements (Germany)

Ordinance on Hazardous Substances (GefStoffV)

Water Hazard Class: WGK 1 (slightly hazardous to water), since Portland cement clinker (EG No.: 266-043-4) is classified according to AwSV

GISCODE: ZP 1 (cement-containing products, low in chromate)

Storage class according to TRGS 510: Storage class 13 (non-flammable solids)

Waste Framework Directive (European List of Waste)

Technical Rules for Hazardous Substances 900 "Maximum Allowable Concentrations" (TRGS 900)

Technical Rules for Hazardous Substances 402 "Determination and Evaluation of Hazards during Operations with Hazardous Substances: Inhalative Exposure" (TRGS 402)

15.2. Chemical Safety Assessment

A chemical safety assessment has not been carried out.

SECTION 16: Other information

(a) Indication of changes

The new version 4.1 meets the requirements for the preparation of safety data sheets according to Regulation (EU) 2020/878 of 18 June 2020.

(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
AwSV	Regulation on facilities concerning handling of water-hazardous substances
CAS	Chemical Abstracts Service
CLP	Classification, labelling and packaging (Regulation (EG) No. 1272/2008)
EC50	Half maximal effective concentration

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ECHA	European Chemicals Agency
EINECS	European Inventory of Existing Commercial chemical Substances
EPA	Type of high efficiency air filter
HEPA	Type of high efficiency air filter
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods
IUPAC	International Union of Pure and Applied Chemistry
LC50	Median lethal dose
MEASE	Metals estimation and assessment of substance exposure
PBT	Persistent, bio-accumulative and toxic
PROC	Process category
REACH	Registration, Evaluation, Authorisation and restriction of Chemicals (Regulation (EG) 1907/2006)
SDS	Safety Data Sheet
STOT	Specific target organ toxicity
TRGS	Technical rules for hazardous substances
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
VCI	Association of the Chemical Industry e.V.
vPvB	Very persistent, very bioaccumulative

(c) Process categories and descriptors

For the professional user, process categories and descriptors according to ECHA Guidance R.12 (ECHA-2010-G-05) can be assigned (see table).

PROC	Identified Uses - Use Description	Manufacture/ Formulation of hydraulic binding agents and building materials	Professional/ Industrial use of
2	Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	X	X
3	Use in closed batch process (formulation)	X	X
5	Mixing or blending in batch processes for formulation of mixtures and articles (multiple and/or significant contact)	X	X
7	Industrial spraying		X
8a	Transfer (charging/discharging) from/to vessels/large containers at non-dedicated facilities		X
8b	Transfer (charging/discharging) from/to vessels/large containers at dedicated facilities	X	X
9	Transfer into small containers (dedicated filling plant, including weighing)	X	X
10	Roller application or brushing		X
11	Non-Industrial spraying		X
13	Treatment of articles by dipping and pouring		X
14	Production of mixtures or articles by tableting, compression, extrusion, pelletizing	X	X
19	Hand-mixing with intimate contact and only personal protective equipment (PPE) available		X
22	Potentially closed processing operations with		X

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	minerals/metals at elevated temperature Industrial setting		
26	Handling of solid inorganic substances at ambient temperature	X	X

(d) Key literature references and sources for 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) *Technische Regel für Gefahrstoffe*: <https://www.baua.de/DE/Angebote/Rechtstexte-und-Technische-Regeln/Regelwerk/TRGS/TRGS.html>.
- (3) MEASE 1.02.01 Exposure assessment tool for metals and inorganic substances, EBRC Consulting GmbH für Eurometaux, 2010: <https://www.ebrc.de/tools/mease.php>.
- (4) *Observations on the effects of skin irritation caused by cement*, Kietzmann et al, *Dermatosen*, 47, 5, 184-189 (1999).
- (5) *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.
- (6) 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).
- (7) 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).
- (8) 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.
- (9) Final report Sediment Phase Toxicity Test Results with *Corophium volutator* for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.
- (10) TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.
- (11) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.
- (12) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.
- (13) European Commission's Scientific Committee on Toxicology, Ecotoxicology and the Environment (SCTEE) opinion of the risks to health from Cr (VI) in cement (Europäische Kommission, 2002): http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf.
- (14) 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
- (15) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.



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- (16) 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.
- (17) 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.
- (18) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.
- (19) ECHA Support Questions and Answers agreed with National Helpdesks. ID 1659, May 2020. <https://echa.europa.eu/es/support/qas-support/qas-agreed-with-national-helpdesks>

(e) Wording of the incomplete written out hazard statements

H317: May cause an allergic skin reaction.
H373: May cause damage to organs (Lung) through prolonged or repeated exposure
EUH203: Contains Chromium(VI). May produce an allergic reaction.

(f) 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

(g) Training advice

In addition to training programs for employees on the topics health, safety and environment, companies must ensure that their employees are able to read and to understand the safety data sheet, and to implement the requirements.

Disclaimer

The information given in this safety data sheet describes the safety requirements of our products and is based on the currently available knowledge. It does not represent any warranty of end product properties. Existing legislation, ordinances, and regulations, including those not mentioned in this safety data sheet, are to be observed by the recipient of our products at his own responsibility.

