

SECTION 1: Identification of the substance or mixture and of the company**1.1 Product identifier**

Hydraulic binders for soil improvement and soil stabilisation.

Bodenbinder 100 bis 700	VBS 200	SCHWENK Recycling-Binder
Bodenbinder 100-h bis 700-h	VBS Binder	Recycling-Binder
Bodenbinder B 10 bis B 70	Deponiebinder	Recycling-Binder P
Bodenbinder L		HRB E 4
Bodenbinder M		
SCHWENK Tragschichtbinder mit hydrophoben Zusätzen		

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

Bodenbinder are used in industrial installations to manufacture/formulate hydraulic binders.

Common Bodenbinder and cement containing mixtures for soil improvement and soil stabilization (hydraulic binders) are used industrially, by professionals as well as by consumers in building and construction work, indoor and outdoor. The identified uses of Bodenbinder and cement containing mixtures cover the dry products and the products in a wet suspension (paste).

A list of uses for professional users, indicating the process categories and descriptors according to ECHA Guidance R.12 (ECHA-2010-G-05) are listed in section 16.

1.3. Details of the supplier of the safety data sheet

SCHWENK Zement KG, Werksgruppe Süd, Werk Allmendingen, Fabrikstraße, D-89604 Allmendingen

Information telephone number: Departement of Quality/Laboratory: +49 7391 581-0

SCHWENK Zement KG, Werksgruppe Nord, Werk Bernburg, Altenburger Chaussee 3, D-06406 Bernburg

Information telephone number: Departement of Quality/Laboratory: +49 3471 358-0

SCHWENK Zement KG, Werksgruppe Nord, Werk Karlstadt, Laudembacher Weg 5, D-97753 Karlstadt

Information telephone number: Departement of Quality/Laboratory: +49 9351 797-0

SCHWENK Zement KG, Werksgruppe Süd, Werk Mergelstetten, Hainenbachstraße 30, D-89522 Heidenheim

Information telephone number: Departement of Quality/Laboratory: +49 7321 310-0

E-mail address of person responsible for the SDS: raiber.klaus@schwenk.de

1.4. Emergency telephone number

Emergency telephone number: +49 6131 19240 of the Giftnotrufzentrale Mainz

Hours of operation: 24 h a day German and Englisch

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture****2.1.1 According to Regulation (EC) No 1272/2008**

Hazard class	Hazard category	Classification procedure
Skin irritation	2, H 315	On the basis of test data
Serious eye damage/eye irritation	1, H 318	On the basis of test data
Specific target organ toxicity single exposure respiratory tract irritation	3, H 335	experiance at humans

Hazard statements

H 318 Causes serious eye damage

H 315 Causes skin irritation

H 335 May cause respiratory irritation

2.1.2 Other information

Full text of the H phrases, hazard statements and EU risk phrases in section 16

Bodenbinder dust may cause irritation of the respiratory system.

When Bodenbinder reacts with water, for instance when making concrete or mortar, or when the Bodenbinder becomes damp, a strong alkaline solution is produced. Due to the high alkalinity, wet Bodenbinder may provoke skin and eye irritation.

2.2. Label elements**2.2.1 According to Regulation (EC) No 1272/2008****Danger****H318** Causes serious eye damage**H315** Causes skin irritation**H335** May cause respiratory irritation**P 280** Wear protective gloves/protective clothing/eye protection/face protection**P 305 + P 351 + P 338 + P 310:** 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**P 302 + P 352 + P 333 + P 313:** IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention**P 261 + P 304 + P 340 + P 312:** 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.**P 102** Keep out of reach of children**P 501** Dispose of contents/container to in accordance with local/regional/national/international regulations (to be specified)**Supplemental information**

Skin contact with wet Bodenbinder 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).




SECTION 3: Composition/information on ingredients**3.1 Substance**

Not applicable, since the product is a mixture

3.2 Mixtures

Mixtures containing cement types according to the EN 197-1 standard and Quicklime according to EN 459-1.

Hazardous substances

Name	Portland cement clinker		Flue dust ⁽¹⁾ from production of cement clinker		Flyash	Quicklime	marl flour
EC number	266-043-4		270-659-9		931-322-8	215-138-9	no chemical substance
CAS number	65997-15-1		68475-76-3		68131-74-8	1305-78-8	--
Registration number	exempted (see 15.1)		01-2119486767-17-xxxx		01-2119491179-xxxx	01-2119475325-36-xxxx	--
Concentration range [wt.-%]	5 - 100		0 - 5		0 - 50	0 - 60	0 - 35
Classification acc. to European Regulation (EC) No 1272/2008	Danger, Cat. 1		Danger, Cat. 1			Danger, Cat. 1	
	Skin irrit. 2	H 315	Skin irrit. 2	H 315		Skin irrit. 2	H 315
	Skin Sens. 1B	H 317	Skin Sens. 1B	H 317		Skin Sens. 1B	H 317
	Eye Dam. 1	H 318	Eye Dam. 1	H 318		Eye Dam. 1	H 318
	STOT SE. 3	H 335	STOT SE. 3	H 335		STOT SE. 3	H 335
							

- (1) Flue Dust is a substance (UVCB), is generated by the production of cement clinker; Another common name is cement kiln dust and bypass flour, dust filter, EGR dust and clinker dust.

SECTION 4: First aid measures

4.1. Description of first aid measures

General notes

No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet Bodenbinder or wet Bodenbinder 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 Bodenbinder, remove and rinse abundantly with water.

For wet Bodenbinder, 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 Bodenbinder (dry or wet) may cause serious and potentially irreversible injuries.

Skin: Bodenbinder 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 Bodenbinder 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 Bodenbinders over a long period of time increases the risk of developing lung diseases.

Environment: Under normal use, common Bodenbinder 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.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Common Bodenbinders are not flammable.

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for fire-fighters

Bodenbinder 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 Bodenbinder 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 Bodenbinder

Use cleanup methods such as vacuum clean-up or vacuum extraction (Industrial portable units, equipped with high efficiency particulate 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 Bodenbinder).

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 Bodenbinder and contact with skin. Place spilled materials into a container. Solidify before disposal as described under section 13.

Wet Bodenbinder

Clean up wet Bodenbinder 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

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 Bodenbinder, 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.

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 Bodenbinder 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 Bodenbinder without taking the proper security measures. Bodenbinder can build-up or adhere to the walls of a confined space. The Bodenbinder 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 due to incompatibility of the materials.

7.3. Specific end use(s)

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

7.4. Control of soluble Cr (VI)

For cements treated with a Cr (VI) reducing agent according to the regulations given in section 15, the effectiveness of the reducing agent diminishes with time. Therefore, cement bags and/or delivery documents will contain information on the packaging date, the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium (VI) below 0.0002 % of the total dry weight of the cement 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**

CAS-Nr.	type of assesment value	assesment value	Short-term exposure limit (15 min reference period)	source	Comment
general dust limit value (portland cement)					
65997-15-1	Long-term exposure Limit (8 h TWA reference period)	4 mg/m ³ (A) 10 mg/m ³ (E)	not fixed	HES EH 40-2011 ⁽²⁾	
water-soluble chromium (VI)					
	limit	2 ppm in Zement	not fixed	Regulation (EG) Nr. 1907/2006	EN 196 - 10

A = respirable fraction; E = Inhalable fraction

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.

If no appropriate exposure data are available, exposure estimation can be done by using MEASE [Reference (3)]. Technical control measures (table in 8.2.1) and individual protection measures (table in 8.2.2) are recommended for all identified uses (section 1.2).

For each individual PROC*, companies can choose from either option A) or B) in the two tables, according to what is best suited to their specific situation. If one option is chosen, then the same option (A and A or B and B) has to be chosen from the other table.

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)	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	7		A) not required or B) integrated local exhaust ventilation	- 87 %
	2, 5, 8b, 9, 10, 13, 14		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		not required	-
	9, 26		A) not required or B) generic local exhaust ventilation	- 72 %
	5, 8a, 8b, 14		A) not required or B) generic local exhaust ventilation	- 77 %

Exposure Scenario	PROC*	Exposure	Localised controls	Efficiency
	19		localised controls are not applicable, process only in good ventilated rooms or outdoor	50 %
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) not required or B) integrated 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

8.2.2 Individual protection measures such as personal protection equipment

General: During work avoid kneeling in fresh Bodenbinder 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 Bodenbinder to avoid contact with skin or mouth.

Before starting to work with Bodenbinder, apply a barrier creme and reapply it at regular intervals.

Immediately after working with Bodenbinder or Bodenbinder-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 Bodenbinder to prevent contact with eyes.

Skin protection



Use impervious, abrasion and alkali resistant gloves (made of low soluble Cr (VI) containing material) internally lined with cotton, boots, closed long-sleeved protective clothing as well as skin care products (including barrier creams) to protect the skin from prolonged contact with wet Bodenbinder. Particular care should be taken to ensure that wet Bodenbinder does not enter the boots.



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

Thermal hazards

Not applicable.

Exposure Scenario	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) P1 mask (FF, FM) or B) not required	APF = 4 -
	5, 8b, 9		A) P2 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 10 APF = 4
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) P1 mask (FF, FM) or B) not required	APF = 4 -
	5, 8b, 9		A) P2 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 10 APF = 4
Industrial uses of wet suspension of hydraulic building and	2, 5, 8b, 9, 10, 13, 14		A) P1 mask (FF, FM) or B) not required	APF = 10 -

Exposure Scenario	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency -assigned protection factor (APF)
construction materials	7		not required	-
Professional use of dry hydraulic building and construction material (indoor, outdoor)	2		P1 mask (FF, FM)	APF = 4
	9, 26		A) P2 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 10 APF = 4
	5, 8a, 8b, 14		A) P3 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 20 APF = 4
	19		P2 mask (FF, FM)	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials	11		A) P2 mask (FF, FM) or B) P1 mask (FF, FM)	APF = 10 -
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16

An overview of the APFs of different RPE (according to EN 529:2005) can be found in the glossary of MEASE [Reference (3)].

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

Environmental exposure control is relevant for the aquatic environment as emissions of Bodenbinder in the different life-cycle stages (production and use) mainly apply to ground and waste water. The aquatic effect and risk assessment cover the effect on organisms/ecosystems due to possible pH changes related to hydroxide discharges. The toxicity of other dissolved inorganic ions is expected to be negligible compared to the potential pH effect.

Any effects that might occur during production and use would be expected to take place on a local scale. The pH of effluent and surface water should not exceed 9. Otherwise it could have an impact on municipal sewage treatment plants (STPs) and industrial waste water treatment plants (WWTPs). For that assessment of the exposure, a stepwise approach is recommended:

- Tier 1:** Retrieve information on effluent pH and the contribution of the Bodenbinder on the resulting pH. Should the pH be above 9 and be predominantly attributable to Bodenbinder, then further actions are required to demonstrate safe use.
- Tier 2:** Retrieve information on receiving water pH after the discharge point. The pH of the receiving water shall not exceed the value of 9.
- Tier 3:** Measure the pH in the receiving water after the discharge point. If pH is below 9, safe use is reasonably demonstrated. If pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thus ensuring safe use of Bodenbinder during production or use phase.

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 Bodenbinder 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

Bodenbinder

according to Regulation (EC) No 1907/2006 (REACH)

2016/15/15 Version 5.2

Replaces all previous versions

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- (d) pH: (T = 20 °C in water, water-solid ratio 1:2): 11 - 13.5
- (e) Melting point: > 1,250 °C
- (f) Initial boiling point and boiling range: Not applicable as under normal atmospheric conditions, melting point >1,250°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 > 1,250 °C
- (l) Vapour density: Not applicable as melting point > 1,250 °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, Bodenbinder will harden into a stable mass that is not reactive in normal environments.

10.2. Chemical stability

Dry Bodenbinder 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 Bodenbinder is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble metals. Bodenbinder dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas. Bodenbinder 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. Quicklime is chemically stable, but reacts vigorously with water to form calcium hydroxide, while generating heat. Quicklime also reacts with carbon dioxide to form calcium carbonate.

10.3. Possibility of hazardous reactions

Bodenbinder do not cause hazardous reactions.

10.4. Conditions to avoid

Due to the potential for vigorous reaction and release of heat as a function of Quicklime concentration the mixing with acids and water should be done in a controlled process. 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 Bodenbinder should be avoided as hydrogen is produced.

10.6. Hazardous decomposition products

Bodenbinder will not decompose into any hazardous products. Addition of water to Quicklime has generated temperatures as high as 80°C.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

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-	-	No acute toxicity by inhalation observed.	(10)

Hazard class	Cat.	Effect	Reference
inhalation		Based on available data, the classification criteria are not met.	
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.	(4) 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.	(11), (12)
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 (5)].	(5), (13)
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.	(14), (15)
Carcinogenicity	-	No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen Portland cement is not classifiable as a human carcinogen (According to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent with one of the other notations.). Based on available data, the classification criteria are not met.	(1) (16)
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.	(17)
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* (U.S. EPA, 1994a) [Reference (6)] and *Selenastrum coli* (U.S. EPA, 1993) [Reference (7)] have shown little toxicological impact. Therefore LC 50 and EC 50 values could not be determined [Reference (8)]. There is no indication of sediment phase toxicity [Reference (9)]. The addition of large amounts of Bodenbinder 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 Bodenbinder is an inorganic material. After hardening, Bodenbinder presents no toxicity risks.

12.3. Bioaccumulative potential

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

12.4. Mobility in soil

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

12.5. Results of PBT and vPvB assessment

Not relevant as Bodenbinder is an inorganic material. After hardening, Bodenbinder 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 - Bodenbinder that has exceeded its shelf life

(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

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 MARPOL 73/78 and the IBC Code

Not relevant.

SECTION 15: Regulatory information**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

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 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 for the examination of the content of water-soluble chromium VI of cement and cement-containing mixtures is approved by the European Committee for Standardization (CEN) as the standard method for documentation compliance with the requirements of the section 1.

The so-called "Good practice guides" which contain advice on safe handling practices can be found from: <http://www.nepsi.eu/good-practice-guide.aspx>. These good practices have been 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.

UK national legislation/requirements

CONIAC Health Hazard Information Sheet No. 26 (CEMENT)

Health and Safety at Work etc Act 1974

Control of Substances Hazardous to Health (Regulations)

PORTLAND CEMENT DUST – criteria document for an occupational exposure limit. June 1994 (ISBN 07176–0763–1)

HSE Guidance Notes EH 26 (Occupational Skin Diseases – Health and Safety Precautions)

HSE Guidance Note EH 40 (Workplace Exposure Limits)

Any authorised manual on First Aid by St. John's/St. Andrew's/Red Cross

Manual Handling Operations Regulations

Environmental Protection Act

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out.

SECTION 16: Other information**16.1 Indication of changes**

compared to previous version. Changed products under 1 and different editorial changes done. Labelling according to Directive 1999/45/EC was deleted.

16.2 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
EC 50	Half maximal Effective Concentration
ECHA	European CHemicals Agency
EINECS	European INventory of Existing Commercial chemical Substances
EPA	Efficiency Particulate 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	High Efficiency Particulate Air filter
H&S	Health and Safety
IATA	International Air Transport Association
IMDG	International agreement on the Maritime transport of Dangerous Goods
LC 50	Median lethal dose
MEASE	Metals Estimation and Assessment of Substance Exposure, EBRC Consulting GmbH for Eurometaux, http://www.ebrc.de/ebrc/ebrc-mease.php
MS	Member State
OELV	Occupational Exposure Limit Value
PBT	Persistent, Bio-accumulative and Toxic
PNEC	Predicted No-Effect Concentration
PROC	PROcess Category
RE	Repeated Exposure
REACH	Registration, Evaluation and Authorisation of Chemicals
RPE	Respiratory Protective Equipment
SCOEL	Scientific Committee on Occupational Exposure Limit values
SDS	Safety Data Sheet
SE	Single Exposure
STP	Sewage Treatment Plant
STOT	Specific Target Organ Toxicity
TLV-TWA	Threshold Limit Value-Time-Weighted Average
TRGS	Technische Regeln für Gefahrstoffe
VLE-MP	Exposure limit value-weighted average in mg by cubic meter of air
vPvB	Very Persistent, very Bio-accumulative
w/w	Weight by weight
WWTP	Waste Water Treatment Plant

16.3 Process category and descriptors

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

PROC	Identified Uses - Use Description	Manufacture/ Formulation of building and construction materials	Professional/ Industrial use of
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

PROC	Identified Uses - Use Description	Manufacture/ Formulation of building and construction materials	Professional/ Industrial use of
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

16.4 Relevant H-statements (number and full text):

- H 315 Causes skin irritation
H 317 May cause an allergic skin reaction
H 318 Causes serious eye damage
H 335 May cause respiratory irritation
EUH 203 Contains chromium (VI). May cause allergic reactions.

16.5 Key literature references and sources of data

- (1) Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006: <http://www.hse.gov.uk/pubns/web/portlandcement.pdf>.
- (2) EH 40/2005 Workplace exposure limits; HSE-Books, second edition 2011 (ISBN 978 0 7176 6446 7)
- (3) MEASE 1.02.01 Exposure assessment tool for metals and inorganic substances, EBRC Consulting GmbH für Eurometaux, 2010: <http://www.ebrc.de/tools/mease.php>.
- (4) Observations on the effects of skin irritation caused by cement, Kietzman 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) and 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (2002).
- (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) and 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (2002).
- (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. Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyGen 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) 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.

- (13) 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
- (14) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.
- (15) 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.
- (16) Exposure to thoracic dust, airway symptoms and lung function in cement production workers; Nordby, K-C., et al; Eur Respir J. 2011. 38(6).

16.6 Methods in accordance with Article 9 of Regulation (EC) 1272/2008 (CLP) to evaluate the information for classification purposes

The review was conducted in accordance with Article 6, paragraph 5 and Annex I to Regulation (EC) No. 1272/2008.

16.7 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.

16.8 Disclaimer

The information on this data sheet reflects the currently available knowledge and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product, including the use of the product in combination with any other product or any other process, is the responsibility of the user.

It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.