



Product: **special binding agents for soil treatment**

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## SECTION 1: Description of the mixture and the company

### 1.1. Product identifier

hydraulic binders for soil treatment and solidification

Geosol®	10 to 90	GeoCal®	10 to 90
Geosol® RD	10 to 90	GeoBinder®	10 to 90
Dorosol® C	10 to 90	GeoSave®	

### 1.2. Relevant identified uses of the mixture and uses that are not recommended

Special binding agents of GHT & Co. KG are hydraulic binders on a cement basis and/or lime basis and specially composed according to the purpose.

In the final application, special binders are used by industrial and professional users (professionals in the construction industry) to prepare a stable soil foundation for technical buildings. The activities related with this include the handling of dry (powder-like) material. They can be assigned to process categories and descriptors in accordance with ECHA guideline R.12 (ECHA-2010-G-05) (see Table in Section 16).

### 1.3. Details on the supplier who provides the material safety data sheet

GHT GmbH & Co KG  
Königsheide 145a  
44359 Dortmund  
Tel: +49 (0) 231-188800-0  
Fax: +49 (0) 231-188800-60

#### Contact point for technical information

post@ght-baustoffe.de

### 1.4. Emergency phone number

+49 (6131) 19240 for the Mainz Poison Control Centre  
Availability: 24hrs / day, in German and English

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## SECTION 2. Possible hazards

### 2.1 Classification of the mixture

#### 2.1.1 In accordance with Ordinance (EC) No. 1272/2008 [CLP]

Hazard Class	Hazard Category	Classification basis
Skin irritation	2	Test results
Serious eye damage / eye irritation	1	Test results
Specific target organ toxicity (STOT) - single exposure	3	Literature review

#### Indication of hazard

H318: Causes severe eye damage

H315: Causes skin irritation

H335: Can irritate the respiratory tract



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**2.2. Identification elements**

2.2.1 According to regulation (EC) No. 1272/2008



Hazard

- H318 Causes severe eye damage
- H315 Causes skin irritation
- H335 Can irritate the respiratory tract

P280 Wear protective gloves / protective clothing / eye protection.

P305+P351+P338+P310 IN CASE OF CONTACT WITH THE EYES: Gently rinse with water for several minutes. If possible, remove any contact lenses present. Continue rinsing. Call POISON INFORMATION CENTRE or doctor immediately.

P302+P352+P333+P313: IN CASE OF CONTACT WITH THE SKIN: Wash with a lot of water and soap. In case of skin irritation or skin rash: get medical advice / medical attention.

P261+P304+P340+P312: Avoid inhalation of dust. IN CASE OF INHALATION: Move the exposed person into the open air and immobilise in a position where he or she breathes easily. If he or she is feeling unwell, call POISON INFORMATION CENTRE or doctor.

*If the product is available for everyone, in addition:*

P102: Keep out of reach of children.

P501: Take contents / container to suitable waste collector points.

**2.3. Other dangers**

Special binding agents do not fulfil the criteria for PBT and vPvB according to appendix XIII of the REACH- Ordinance (EC) No.1907/2006.

**SECTION 3: Composition / information on components**

**3.1. Substances**

Not applicable because these products concern mixtures.

**3.2. Mixtures**

Hydraulic special binding agents on the basis of hydraulic components / cement and/or calcium oxide

Dangerous components

Name	Portland cement clinker	Calcium oxide	Burnt oil shale	Flue dust
EC-Number	266-043-4	215-138-9	Not allocated	270-659-9
CAS-Number	65997-15-1	1305-78-8	93685-99-5	68475-76-3
Registration number	Except (see 15.1)	01-2119486767-17-xxxx	01-2119703178-42-xxxx	01-2119486767-17-xxxx



Concentration range [M.-%]	0 - 100	0 - 100	0 - 40	0 – 20
Classification according to Ordinance (EC) No.1272/2008 [CLP]	hazard , cat. 1 H315, H 317, H318, H335	hazard, cat. 1 H315, H318, H335	hazard, cat. 1 H315, H318, H335	hazard, cat. 1 H315, H317, H318, H335

SECTION 4: first aid measures

4.1. Description of the first aid measures

**General information**

No special personal protective equipment is necessary for first responders. However, first responders should avoid the contact with wet special binding agent.

**Eye contact**

Do not rub eyes dry, because additional corneal damage is possible through the mechanical stress. Remove contact lens if necessary and rinse the eye immediately, holding eyelids, apart under running water for at least 20 minutes to remove all particles. If possible, use isotonic eyewash solution (0,9 % NaCl). Always consult occupational health practitioners or ophthalmologist.

**Skin contact**

Remove dry special binding agent and rinse with plenty of water. Rinse wet special binding agent with a lot of water. Remove drenched clothes, shoes, watch, etc.. Clean these thoroughly before re-use. With cases of skin discomfort, consult doctor.

**Inhaling**

Provide for fresh air. Dust from neck and nasal areas should be removed quickly. If discomfort, coughing or persistent irritation occur, consult doctor.

**Swallowing**

Do not induce vomiting. In case of consciousness, rinse mouth and drink plenty of water. Contact Doctor or poison emergency call centre.

4.2. Important acute and delayed appearance symptoms and effects

**Eyes:** Eye contact with special binding agent (dry or wet) can cause serious and possibly remaining eye damage.

**Skin:** Special binding agent can have an irritating effect on wet skin through persistent contact (as a result of sweating or humidity).

Contact between special binding agent and wet skin can cause skin irritation, dermatitis or serious skin damage.

*For further information see (1).*

**Respiration:** Repeated inhaling of larger special binding agent dust volumes for a longer period increases the risk for lung disease.

4.3. Notes on medical emergency relief or special treatment

If a physician will be consulted, please present this material safety data sheet.



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SECTION 5: Measures for fire-fighting

**5.1. Extinguishing agents**

suitable extinguishing agents	Special binding agent is not flammable . Use dry-, foam- or CO2-extinguisher to extinguish environment fire. Adapt extinguishing measures to suit the environment.
inappropriate extinguishing agents	Do not use water, avoid moisturization

**5.2. Special hazards posed by the mixture**

Special binding agent is neither explosive nor flammable. The contained portion of Calciumoxide reacts with water causing heat generation. This can involve risk in combination with flammable materials.

**5.3. Notes for fire-fighting**

Avoid formation of dust, use respiratory filter device, adapt extinguishing measures to suit the environment.

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SECTION 6: Measures in case of unintentional emission

**6.1. Personal precautions, protective equipment and emergency procedures**

**6.1.1 Staff not trained for emergencies**

Wear protective clothing as described under section 8. Follow the instructions for safe handling as described under section 7.

**6.1.2 Emergency personnel**

Emergency plans are not necessary.  
However, with high dust exposure, respiratory protection is necessary.

**6.2. Environmental protection measures**

Do not allow special binding agents to enter into water bodies, sewerage, surface water or ground water (increase of ph-value). In the event of accidental release of larger amounts of special binding agent into water bodies or sewerage notify the respective authorities.

**6.3. Methods and material for containment and cleaning**

Absorb spilled special binding agent mechanically (dry) and use it if possible.

For the cleaning, use very dry methods, such as for example vacuum suction (portable devices with highly efficient filter systems (EPA and HEPA-Filters, EN 1822-1:2009) or equivalent techniques), which cause no dust development. Never use compressed air for cleaning.

If dust development results during a dry cleaning, the personal protective equipment is absolutely to be used. Avoid inhaling of special binding agent dust and skin contact. Fill spilled material back into containers. A future use of material that has not been in contact to water is possible.

**6.4. Reference to other sections**

For further information to exposure monitoring refer to sections 8 and 13 for details.



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SECTION 7: Handling and storage

**7.1. Preventive measures for safe handling**

**7.1.1 Recommendations on preventive measures**

Please, note the recommendations in section 8.  
For the removal of dry special binding agent, please note Section 6.3.

**Measures for the prevention of fires**

Not applicable.

**Measures for the prevention of aerosol and dust formation**

Do not sweep up. For cleaning, use dry methods if possible, such as vacuum suction that cause no dust development.

**Measures for the protection of the environment**

Process special binding agents immediately after dosing and avoid overdosage.

**7.1.2 Notes on general hygiene measures**

Avoid inhalation, swallowing as well as skin and eye contact. At work, do not eat drink or smoke. Do not wear contaminated clothes outside the workplace and regularly clean it. In dusty atmospheres, wear breathing mask and safety goggles. Wear protective gloves, so as to avoid skin contact.

**7.2. Conditions for safe storage, taking into account incompatibilities**

Special binding agents should be stored under dry (internal condensation minimised) water-protected conditions, cleanly and protected from contamination.

Storage areas for special binding agents, such as silos, boiler, silo vehicles or other packs are not to be walked on or into without appropriate safety measures because the danger exists to be buried and suffocate. In such surrounded spaces, special binding agent can form walls and bridges, however, they can unexpectedly break down.

Do not use aluminium containers as there is known material incompatibilities in combination with water. Keep special binding agents away from acids, larger amounts of paper, straw and nitro compounds.

Storage class: VCI- Storage class 13 (Non-combustible solids).

SECTION 8: **Limitation and monitoring of the exposure** / Personal protective equipment

**8.1 Parameters to be monitored**

<b>Exposure limit values</b>	<b>exposure pathway</b>	<b>exposure frequency</b>	<b>Comment</b>
Portland cement (dust): 5 (E) mg/m <sup>3</sup> General dust limit value: 1,25 (A) mg/m <sup>3</sup> 10 (E) mg/m <sup>3</sup>	inhalation	workplace exposure limit value (shift average value)	TRGS 900 (Reference 2)
Water-soluble chromium VI: 2 ppm	dermal route	Short term (acute) Long term	Ordinance (EC) No.1907/2006
Calciumoxide (dust): 1 (E) mg/ m <sup>3</sup> 1 mg/m <sup>3</sup>	inhalation	workplace exposure limit value (shift average value)	TRGS 900



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**8.2. Limitation and monitoring of the exposure**

For the observance of the workplace limit values, combinations of technical and individual preventive measures are often necessary. If there are no suitable workspace measurements on exposure, an exposure evaluation and selection of suitable preventive measures can be done on the basis of the tool MEASE (Reference 3) . For the uses identified (Section 1.2), technical control devices (Table in 8.2.1) and individual preventive measures (Table in 8.2.2) are recommended. Variation A can be combined only with A, and B only with B.

**8.2.1 Suitable technical control devices**

Measures for the avoidance of dust formation and dust spreading, for example, suitable ventilation systems and cleaning methods which kick up no dust.

Utilization	PROC*	Exposure	Technical means	Efficiency of respiratory protection (APF)
Industrial manufacture / formulation of hydraulic binders and building materials	2, 3	Duration is not limited (up to 480 Minutes per shift, 5 Shifts per week)	not required	-
	14, 26		A) not required or B) local exhaust ventilation	APF = 4  -
	5, 8b, 9		A) general ventilation or B) local exhaust ventilation	APF = 10 APF = 4
Industrial use of dry and hydraulic binders and building materials (inside and outside)	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 from hydraulic binders and building materials (inside and outside)	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) not required or B) local exhaust ventilation	-  78 %
Commercial use of dry hydraulic binders and building materials (inside and outside)	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 %	



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	19		Ventilation system is not required, activity, however, only in well ventilated rooms or outside	50 %
Commercial use of wet suspensions from hydraulic binders and building materials (inside and outside)	11		A) not required or B) local exhaust ventilation	- 72%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

\*definition in 1.2

### 8.2.2 Individual preventive measures, for example, personal protective equipment

**General:** At work, do not eat, drink or smoke. Before the breaks and after work, wash hands and if necessary take a shower to remove adhering special binding agent. Avoid contact with skin and eyes. After work with special binding agent, workers should wash or take a shower and use skin care means. Clean contaminated clothing, shoes, watches etc. before re-use.

#### Facial / eye protection



In case of dust formation or risk of splashing, use tight fitting safety goggles according to EN 166.

#### Skin Protection



Wear water tight protective gloves resistant to alkali and resistant to abrasion. For example, nitrile impregnated cotton gloves with CE- mark (see Trade association regulations BGR 195) are suitable. Observe maximum wearing time. Leather gloves are not suitable because of their water permeability and may release chromate compounds. Wear boots and long-sleeved clothing as well as use skin protectants.

#### Respiratory protection



When exceeding the exposure limit values (e.g. with open working with product in powder form), a suitable breathing mask is to be used (e.g. according to EN 149, EN 140, EN 14387, EN 1827). As a rule, use particle-filtering half-mask type FFP1 or FFP2 (see Table). General information can be found in the Trade association regulations BGR/GUV-R 190).

Utilization	PROC*	Exposure	Type of respiratory protection	Efficiency of respiratory protection (APF)
Industrial manufacture / formulation of hydraulic binders and building materials	2, 3	Duration is not limited (up to 480 Minutes per shift, 5 Shifts per	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



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use of dry and hydraulic binders and building materials (inside and outside)	14,22, 26	A) P1 Mask (FF, FM) or not required	APF = 4 -
	5, 8b, 9	A) P2 Mask (FF, FM) or B) P1 Mask (FF, FM)	APF = 10 APF = 4
Industrial use of wet suspensions from hydraulic binders and building materials (inside and outside)	2, 5, 8b, 9, 10, 13, 14	not required	-
	7	A) P1 Mask (FF, FM) or B) not required	APF = 4 -
Commercial use of dry hydraulic binders and building materials (inside and outside)	2	P1 Mask (FF, FM)	APF = 4
	9,26	A) P2 Mask (FF, FM)	APF = 20
	5, 8a, 8b, 14	A) P3 Mask (FF, FM) or B) P1 Mask (FF, FM)	APF = 10 APF = 4
	19	P2 Mask (FF, FM)	APF = 10
Commercial use of wet suspensions from hydraulic binders and building materials (inside and outside)	11	A) P1 Mask (FF, FM) or B) not required	APF = 4 -
	2, 5, 8a, 8b, 9, 10, 13, 14, 19	not required	-

### 8.2.3 Limitation and monitoring of the environmental exposure

**Air:** Observance of the dust emission limits according to the technical instructions Air.

**Water:** Do not allow special binding agents to enter into the ground water or sewage system. Through exposure, an increase of the pH value is possible. With a pH value of more than 9, ecological-toxicological effects can appear. Hence, water guided or flowing into the sewage system may not lead to a respective pH value. Wastewater and Groundwater Ordinance must be complied with.

**Soil:** Compliance with the Federal Soil Protection Ordinance.





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## SECTION 9: Physical and chemical properties

### 9.1. Information on fundamental physical and chemical properties

- (a) Appearance: Special binding agent is a finely-ground inorganic solid (grey or white powder)
- (b) Odour: None
- (c) Odour threshold: no, since odourless
- (d) pH: (T = 20°C in water, water - solids ratio 1:2): 11-13,5
- (e) Melting point: > 1 250 °C
- (f) Boiling point or boiling range: Not applicable, since, under normal conditions, the melting point is more than 1250°C
- (g) Flash point: Not applicable, since no liquid
- (h) Verdampfungsgeschwindigkeit: Not applicable, since no liquid
- (i) Flammability (solid, gaseous): Not applicable, because material a solid and non-combustible
- (j) Upper / lower flammability or explosive limits: Not applicable, since nongaseous
- (k) Vapour pressure: Not applicable, since melting point > 1250 °C
- (l) Dampfdichte: Not applicable, since melting point > 1250 °C
- (m) Relative density: 2,75-3.20 g/cm<sup>3</sup>; bulk density: 0,9-1,5 g/cm<sup>3</sup>
- (n) Solubility in water (T = 20 °C): low (0,1-1,5 g/l)
- (o) Partition coefficient: n-Octanol/ water: Not applicable, since inorganic
- (p) Auto-ignition temperature: Not applicable (not pyrophoric - no organo-metallic, organo-semi-metallic or organo-phosphine compounds or derivatives and no other pyrophoric components)
- (q) Decomposition temperature: Not applicable, since no inorganic peroxides are contained
- (r) Viscosity: Not applicable, since no liquid
- (s) Explosive properties: Non-exclusive and non pyrotechnical. No development of gas or self-sustaining exothermic chemical reactions.
- (t) Oxidising properties: Not applicable, as special binder has no oxidising properties.

### 9.2. Other Information

Not applicable.

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## SECTION 10: Stability and Reactivity

### 10.1. Reactivity

Special binding agent is a hydraulic substance. In contact with water, a deliberate reaction takes place. In the course of this, special binding agent hardens and forms a solid mass which does not react with its environment.

### 10.2. Chemical Stability

Special binding agent is stable as long as it is stored properly and dry (Section 7). Contact with incompatible materials has to be avoided. Wet special binding agent is alkaline and incompatible with acids, ammonium salts, aluminiums and other base metals. Here, hydrogen can be formed. Special binding agent is soluble in hydrofluoric acid and here, corrosive silicon tetrafluoride gas forms. Contact with these incompatible materials has to be avoided.

With water, special binding agent forms calcium silicate hydrates, calcium aluminate hydrates and calcium hydroxide. The calcium silicates of the special binding agent can react with strong oxidizing agents such as fluorides.



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**10.3. Possibility of dangerous reactions**

Not applicable.

**10.4. Conditions to be avoided**

Humidity during the storage can lead to lump formation and loss of product quality.

**10.5. Incompatible materials**

Acids, ammonium salts, aluminium or other base metals.

**10.6. Hazardous decomposition products**

Special binding agent does not decompose into hazardous components.

SECTION 11: Toxicological information

**11.1. Information on toxicological effects**

Hazard Class	Cat.	Effect	Reference
Acute toxicity- dermal route	-	Limit Test, Rabbit, 24-hour Exposure, 200 mg/kg Body weight - no lethality. Based on the available data, the classification criteria are considered as not met	(4)
Acute toxicity- Inhalation	-	Limit Test, Rat, with 5 mg/m <sup>3</sup> , no acute toxicity. Study was conducted with Portland cement clinker, the main component of cement. Based on the available data, the classification criteria are considered as not met.	(10)
Acute toxicity- oral	-	In animal studies with cement kiln dust and cement dusts, no acute oral toxicity was observed. Based on the available data, the classification criteria are considered as not met.	literature research
Caustic effect / irritant effect on the Skin	2	Cement has a skin and mucous membrane irritant effect. Dry cement in contact with moist skin or skin in contact with moist or wet cement may lead to different irritant and inflammatory reactions of the skin, e.g. Redness and cracking. Prolonged contact in combination with mechanical abrasion can cause severe skin damage.	(4) and experience in humans
Severe eye damage / eye irritation	1	In the in vitro test, Portland cement clinker (main component of cement) showed differently strong effects on the cornea. The calculated „irritation index“ is 128. Direct contact with cement can lead to corneal damage, on the one hand through the mechanical effect and on the other hand through an immediate or later irritation or inflammation. Direct contact with larger amounts of dry cement or splashes of wet cement can have effects that range from a moderate eye irritation (e.g. conjunctivitis or blepharitis) up to serious eye damage and loss of sight.	(11), (12) and experience in humans

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Sensitisation of the skin	1	With individual people, skin eczemas can form after contact with wet cement. These are triggered either through the pH-value (irritant contact dermatitis) or by immunological reactions with water-soluble chromium (VI)	(5), (13)
Sensitisation of the respiratory tract	-	There are no signs for a sensitisation of the respiratory tract. Based on the available data, the classification criteria are considered as not met.	(1)
Germ cell mutagenicity	-	No signs for germ cell mutagenicity. Based on the available data, the classification criteria are considered as not met.	(14), (15)
Carcinogenicity	-	A causal context between cement and cancer was not ascertained. Epidemiological studies did not allow to draw conclusions about a relationship between exposure to cement and cancer. Portland cement is not classified as a human carcinogen according to ACGIH A4: "Substances that due to insufficient data material cannot be conclusively assessed regarding human carcinogenicity. In vitro-Tests or animal studies do not provide sufficient evidence of carcinogenicity to assign this substance to another classification." Portland cement contains above 90 % of Portland cement clinker. Based on the available data, the classification criteria are considered as not met.	(1)  (16)
Reproductive toxicity	-	Based on the available data, the classification criteria are considered as not met.	no evidence based on experience in humans
spezifische Zielorgantoxizität bei einmaliger Exposure		Cement dust exposure can led to irritation of the respiratory organs (pharynx, throat, lung). Coughing, sneezing and shortness of breath can be the result if the exposure is above the workplace limit value. Occupational exposure to cement dust can lead to impairment of respiratory function. However, there is currently still no sufficient knowledge to be able to derive a dose-response relationship.	(1)
specific target organ toxicity after repeated exposure	-	Long-term exposure to respirable cement dust above the occupational exposure limit may cause coughing, shortness of breath and chronic obstructive changes of the airways. At low concentrations, no chronic effects were observed. Based on the available data, the classification criteria are considered as not met.	(17)



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Aspiration hazard	-	Not applicable, since cement is not available as an aerosol.	
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Cements (normal cements) and Portland cement clinker having the same toxicological and ecotoxicological properties.

**Health effects due to exposure**

Cement may worsen existing disorders of skin, eyes and respiratory tract, for example in lung emphysema or asthma.

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SECTION 12: Environmental information

**12.1. Toxicity**

Special binding agent is considered as not hazardous to the environment. Ecological-toxicological investigations with Portland cement in *Daphnia magna* (U.S. EPA, 1994a) [Reference (6)] and *Selenastrum Coli* (U.S. EPA, 1993) [Reference (7)] only showed a slight toxic effect. Therefore, the LC50 and EC50 values could not be determined [Reference (8)]. No toxic effects on sediments could be ascertained, either [Reference (9)]. However, if larger amounts of special binding agent are released in water, this can lead to a pH value increase and hence be toxic to aquatic life in particular circumstances.

**12.2. Persistence and degradability**

Not applicable, since special binding agent is an inorganic mineral substance. Special binding agent residues remaining behind during hydration pose no toxicological risk.

**12.3. Bioaccumulative potential**

Not applicable, since special binding agent is an inorganic mineral substance. Special binding agent residues remaining behind during hydration pose no toxicological risk.

**12.4. Mobility in soil**

Not applicable, since special binding agent is an inorganic mineral substance. Special binding agent residues remaining behind during hydration pose no toxicological risk.

**12.5. Results of the PBT- and vPvB- assessment**

Not applicable, since special binding agent is an inorganic mineral substance. Special binding agent residues remaining behind during hydration pose no toxicological risk.

**12.6. Other harmful effects**

Not applicable.



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**SECTION 13: Disposal instructions**

**13.1. Waste treatment methods**

**Unused residual volume of the dry product**

Take up special binding agents dry, label containers. Under avoidance of a dust exposure, reuse /recycle as far as possible. In case of disposal with water, harden, and disposal as described under „ products hardened after water addition “.

**Damp products and product slurries**

Allow damp products and product slurries to harden and do not discharge into the sewerage system. Disposal as described under „ products hardened after water addition “.

**Products hardened after water addition**

Dispose of according to local regulations. Do not discharge into the sewerage system. Dispose of the hardened product like concrete waste and concrete sludge. AVV depending on the origin:  
AVV 17 01 01 (concrete) or AVV 10 13 14 (concrete waste and concrete sludge)

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**SECTION 14: Information on transport**

Special binding agents are not subordinate to the International hazardous goods regulations (IMDG, IATA, ADR/RID). Hence, no hazardous goods classification is necessary.

**14.1. UN-Number**

Not applicable.

**14.2. Proper UN- Shipping Name**

Not applicable.

**14.3. Transport hazard classes**

Not applicable.

**14.4. Packaging group**

Not applicable.

**14.5. Environmental hazards**

Not applicable.

**14.6. Special precautions for user**

Not applicable.

**14.7. Transport in bulk according to Annex II of the MARPOL Convention 73/78 and according to IBC-Code**

Not applicable.



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## SECTION 15: Legal provisions

### **15.1. Safety, health and environmental regulations / legislation specific for the mixture**

Special binding agent is a mixture and, hence, does not come under the registration obligation of the EC-Ordinance 1907/2006 (REACH). Portland cement clinker is excluded from the registration obligation according to Art. 2.7(b) and Annex V.10 of the EC-Ordinance 1907/2006 (REACH).

In accordance with Annex XVII section 47 of the EC-Ordinance 1907/2006, there is a usage and marketing ban for cements and cement-containing preparations,

1. Cement and cement-containing preparations may not be used or marketed if their content of soluble chromium VI after hydration amounts to more than 0.0002 % of the dry matter contents of the cement.
2. If reducing agents are used, then, regardless of the validity of other common regulations for the classification, packaging and identification of hazardous substances and preparations, it has to be stated on the packaging of cement or cement-containing preparations, clearly legible and indelibly, when the product was packaged as well as under which conditions and how long it can be stored without exceeding the 1 stated limit value.

In deviation, numbers 1 and 2 shall not apply to the marketing in terms of monitored, self-contained and totally automated processes and usage in such processes where cement and cement-containing preparations exclusively come into contact with machines and there is no risk of skin contact.

The manufacturers of cement have committed themselves within the scope of the „ Agreement on Workers Health Protection through the Good Handling and Use of Crystalline silicon dioxide and Products containing it “to introduce so-called "Best practices" for safe handling (<http://www.nepsi.eu/good-practice-guide.aspx>).

### **National regulations**

Water hazard class: WGK 1 (slightly hazardous for water) (Self-classification in accordance with VwVwS of 17.05.1999).

GISCODE: ZP 1 (cementitious products, low in chromate)

Ordinance on the European Waste Catalogue (Waste Catalogue -Ordinance)

Storage class according to TRGS 510: Storage class 13 (Non-combustible solids)

Ordinance for protection against hazardous substances (Ordinance on Hazardous Substances - GefStoffV) Technical Rule for Hazardous Substances 900

(Occupational Exposure Limits) TRGS 900

Technical Rule for Hazardous Substances 402 Determination and assessment of the risks from activities involving hazardous substances: Inhalation Exposure (TRGS 402)

### **15.2. Chemical Safety Assessment**

A Chemical Safety Assessment has not been carried out.

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## SECTION 16: Other Information

### **16.1 Changes to the previous version**

New version in accordance with Ordinance (EU) No.1907/2006 (REACH)

### **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 (Protection factor of Face masks)

CAS Chemical Abstracts Service

CLP Classification, labelling and packaging (Ordinance (EC) No.1272/2008)

EC50 Half maximal effective concentration (mean effective concentration)

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ECHA European Chemicals Agency (Europäische Chemikalienbehörde)  
 EINECS European Inventory of Existing Commercial chemical Substances  
 EPA Type of high efficiency air filter (high efficiency air filter type)  
 HEPA Type of high efficiency air filter (high efficiency air filter type)  
 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 (mittlere tödliche Dosis)  
 MEASE Metals estimation and assessment of substance exposure  
 PBT Persistent, bio-accumulative and toxic (persistent, bioakkumulativ, toxisch)  
 PROC Process category (Process category / category of use)  
 REACH Registration, Evaluation and Authorisation of Chemicals (Ordinance (EC) 1907/2006) SDB  
 Material Safety Data Sheet  
 STOT Specific target organ toxicity (spezifische Zielorgantoxizität)  
 TRGS Technical Rules for Hazardous Substances  
 UVCB Substances of Unknown or Variable composition, Complex reaction products or Biological materials  
 VCI Verband der chemischen Industrie e.V.  
 vPvB Very persistent, very bioaccumulative (sehr persistent, sehr bioakkumulativ)  
 VwVwS Administrative Regulation water-polluting substances

**16.3 Process categories and descriptors**

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

PROC	Identified uses	Manufacture / formulation of hydraulic binders and building materials	Commercial / Industrial use of
2	Use in self-contained, continuous process with occasional controlled exposure (e.g. sampling)	X	X
3	Use in self-contained lot processes (formulation)	X	X
5	Mixing or blending in lot processes for the formulation of mixtures and products	X	X
7	Industrial spraying		
8a	Transfer (filling / Draining) from / to vessel (s) / large container (s) into facility not only specifically provided for one product		X
8b	Transfer (filling / Draining) from / to vessel (s) / large container (s) into facility not only specifically provided for one product	X	X
9	Transfer into small containers (specific bottling plant, including	X	X
10	Roller or brushing application		
11	Non-industrialist spraying		
13	Treatment of products through immersion and casting		



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14	Production of mixtures or products through tableting, compression, extrusion,		
19	Manual mixing with close contact and only personal protective equipment		X
22	Potentially self-contained processing with minerals / metals at increased temperature industrial areas		
26	Handling of solid inorganic substances at ambient temperature	X	X

**16.4. Relevant hazard statements (H- Sentences) full text**

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

**16.5 Literature data and data sources**

- (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) Technische Regel für Gefahrstoffe „Arbeitsplatzgrenzwerte“, 2009, GMBI No.29p.605.
- (3) MEASE 1.02.01 Exposure assessment tool for metals and inorganic substances, EBRC Consulting GmbH für Eurometaux, 2010: <http://www.ebrc.de/ebrc/ebrc-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).
- (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](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) 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, H. Notø, H. Kjuus, M. Skogstad and K.-C. Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.

### **16.5 Training proposals**

In addition to training programs for workers about health, safety and the environment, companies must ensure that their employees can read the Material Safety Data Sheet, understand it and implement the requirements.

### **16.6 Disclaimer clause**

The information in this Material Safety Data Sheet describes the safety requirements of our product and is based on our present knowledge. It is no assurance of product characteristics. Existing laws, Ordinances and regulatory frameworks, also those not stated in this data sheet are to be followed by the recipient of our products under his own responsibility.

