

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Trade name:****ZAPRAWA 451****1.2 Relevant identified uses of the substance or mixture and uses advised against****Life cycle stages**

C/PW Consumer use / Widespread use by professional workers

Sector of Use

SU19 Building and construction work

Product category

PC9b Fillers, putties, plasters, modelling clay

Process category

PROC11 Non industrial spraying

PROC19 Manual activities involving hand contact

Environmental release category

ERC10a / ERC11a Widespread use of articles with low release

Article category

AC4 Stone, plaster, cement, glass and ceramic articles

Application of the substance / the preparation

Ready-mixed mortar - Product for an industrial, technical and private use for mixing with water and subsequent processing on buildings. For all other uses is advised against/ not recommended.

1.3 Details of the supplier of the safety data sheet**Manufacturer/Supplier:**KREISEL - Technika Budowlana Sp. z o.o.
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60-462 Poznań
Poland

Tel. +48 61 846 79 00

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poznan@kreisel.pl

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Further information obtainable from:

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On working days 8 a.m. - 4 p.m.

1.4 Emergency telephone number

National poisons information centre: +44/(0)171 - 635 9191

National Health Service: 111

European emergency call: 112

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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008



GHS05 corrosion

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.

STOT SE 3 H335 May cause respiratory irritation.

Additional information:

The classification in terms of skin and eye irritation is based on the results of animal studies, see section 16 literature [4], [11] and [12].

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the CLP regulation.

Hazard pictograms



GHS05 GHS07

Signal word

Danger

Hazard-determining components of labelling:

Portland cement clinker

Hazard statements

H315 Causes skin irritation.

H318 Causes serious eye damage.

H317 May cause an allergic skin reaction.

H335 May cause respiratory irritation.

Precautionary statements

P102 Keep out of reach of children.

P261 Avoid breathing dust.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P315 Get immediate medical advice/attention.

P302+P352 IF ON SKIN: Wash with plenty of soap and water.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362+P364 Take off contaminated clothing and wash it before reuse.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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P501 Dispose of contents/container to an authorised disposal firm or communal collection point.

Unique Formula Identifier (UFI-Code) according to Regulation (EC) No 542/2017
KQU0-C0GH-U00S-JQTD

2.3 Other hazards

As soon as the dry mixture comes into contact with water or humidity, a strongly alkaline solution will be formed. Wet mortar may cause skin and eye irritation due to the high alkalinity. Especially with prolonged contact (e.g. knees in wet mortar) the risk of serious skin damage increases due to the alkalinity.

The part of respirable, cristaline siliciumdioxide amounts below 1%. The product ist no subject to a declaration obligation. However, the use of breathing protection is advisable.

Dust from the dry mixture can cause respiratory irritation. Frequent inhalation of large amounts of dust increases the risk of developing lung diseases.

The mixture is chromate reduced and therefore is no risk of sensitization by chromate. The ready to use form after addition of water contains in maximum 0,0002% of soluble chromium(VI) based on the dry weight of the cement. Proper dry storage and compliance with the maximum storage time is required for an effective chromate reduction.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Chemical characterization: Substances

This product is a mixture.

3.2 Chemical characterisation: Mixtures**Description:**

Mixture of inorganic binders, fillers and nonhazardous additions

Dangerous components:

CAS: 65997-15-1 EINECS: 266-043-4 REACH: 02-2119682167-31*	Portland cement clinker ⚠ Eye Dam. 1, H318; ⚠ Skin Irrit. 2, H315; Skin Sens. 1, H317; STOT SE 3, H335	25 - 50%
CAS: 14808-60-7 EINECS: 238-878-4 REACH: *	Silicon dioxide (quartz, <1% RCS) Substance with a Community workplace exposure limit	1 - 2.5%
CAS: 122-99-6 EINECS: 204-589-7 Index number:... 603-098-00-9 REACH: 01-2119488943-21	2-Phenoxyethanol ⚠ Acute Tox. 4, H302; Eye Irrit. 2, H319	< 1%

Other components (>20%):

CAS: 1317-65-3 EINECS: 215-279-6 REACH: *	Limestone (Calcium carbonate)	25 - 50%
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Additional information:

For the wording of the listed hazard phrases refer to section 16.

* Not subject to registration in accordance with EC 1907/2006 Annex V (point 7) or Article 2.

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SECTION 4: First aid measures**4.1 Description of first aid measures**

First aid

General information:

For first responder no special personal protective equipment is required. First responder should avoid contact with the product.

After inhalation:

Remove dust source and provide fresh air or bring the person in fresh air. If discomfort, cough or persistent irritation, seek medical attention.

After skin contact:

Immediately wash with water and soap and rinse thoroughly. Immediately remove all soiled and contaminated clothing. Wash contaminated clothes before reuse. Clean contaminated shoes before reuse. If skin irritation continues, consult a doctor.

After eye contact:

Do not rub eyes because additional damage to eyes can be caused by mechanical stress. If necessary, remove contact lenses and flush the eye immediately while holding eyelids open to water for at least 20 minutes. If possible, isotonic eyewash solution (e. g. 0,9% NaCl). Always consult an occupational physician or ophthalmologist.

After swallowing:

Do not induce vomiting. If conscious rinse mouth with water and drink plenty of water. Consult a physician or poison control center.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are described in section 2 and 11.

Eye contact with the product may cause serious and potentially permanent damage.

The product in the dry state by prolonged contact can also have an irritant effect on moist skin. The contact with moist skin may cause skin irritation, dermatitis or other serious skin damage.

4.3 Indication of any immediate medical attention and special treatment needed

If a physician is to be consulted, as per possibility he should be presented this safety data sheet.

SECTION 5: Firefighting measures**5.1 Extinguishing media****Suitable extinguishing agents:**

The mixture is flammable neither in the delivery condition not in mixed conditions. Extinguisher and fire fighting are therefore adjusted to the surrounding fire.

5.2 Special hazards arising from the substance or mixture

This product is neither explosive nor flammable, and non-oxidizing with other materials. Inorganic dust can appear in case of fire. Avoid formation of dust. Reacts alkaline with water.

5.3 Advice for firefighters

No special measures required. Collect contaminated fire fighting water separately. It must not enter the sewage system. Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

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SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

Avoid formation of dust. Avoid inhalation, eye and skin contact. If appropriate, reference must be made to exposure controls and personal protection (see section 8).

6.2 Environmental precautions

Do not allow product to reach water because an increase of pH may be caused. Ecotoxicological effects may occur when the pH-value is above 9. National regulations for waste water and groundwater are to be observed.

6.3 Methods and material for containment and cleaning up

Collect spilled dry material dry and use if possible. Avoid formation of dust. For cleaning use at least industrial vacuum dust class M (DIN EN 60335-2-69). Do not dry sweep. Never use compressed air for cleaning. If, during a dry cleaning dust is formed, then it is necessary to use personal protective equipment. Avoid inhalation of emerging dust and contact with skin. Dispose of the material collected according to regulations.

Let the mixed mortar solidify and dispose of (see section 13.1).

6.4 Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

SECTION 7: Handling and storage**7.1 Precautions for safe handling:**

Ensure good ventilation/exhaustion at the workplace. Prevent formation of dust. Avoid contact with the eyes and skin. Wear protective clothing. Washing facilities / Water for cleaning eyes and skin should be available. Persons, who tend to skin diseases or other hypersensitivity reactions of the skin, should not handle the product. Do not eat, drink, smoke or sniff while working.

Do not use products after the specified storage period any more, because the effect of the reducing agent contained decreases and the content of soluble chromium (VI) may exceed those limits mentioned in section 2.3. In these cases may develop an allergic Chromate dermatitis with prolonged contact due to the water-soluble chromate contained in the product.

Information about fire - and explosion protection:

No special measures required.

7.2 Conditions for safe storage, including any incompatibilities**Storage:****Requirements to be met by storerooms and receptacles:**

Keep out of reach of children. Store in cool, dry place in tightly closed receptacles. Do not use light alloy receptacles.

Information about storage in one common storage facility:

Keep away from foodstuffs, beverages and feed.

Further information about storage conditions:

Store dry. Prevent ingress of water and moisture. Always keep in original container. Improper storage (ingress of moisture) or exceeding the maximum storage period, can subside the effect of contained chromate reducer (see section 7.1).

Minimum storage life:

Minimum storage life (store dry, up to 20°C): See indication on package.

Storage class: 13

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7.3 Specific end use(s)

No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters**Ingredients with limit values that require monitoring at the workplace:****65997-15-1 Portland cement clinker**

WEL (Great Britain)	Long-term value: 10* 4** mg/m ³ *inhalable dust **respirable dust
AGW (Germany)	Long-term value: 5 E mg/m ³ DFG

14808-60-7 Silicon dioxide (quartz, <1% RCS)

BOELV (EU)	Long-term value: 0.1* mg/m ³ *respirable fraction
MAK (Germany)	alveolengängige Fraktion

122-99-6 2-Phenoxyethanol

AGW (Germany)	Long-term value: 5.7 mg/m ³ , 1 ppm 1(I);DFG, Y, 11
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Additional Occupational Exposure Limit Values for possible hazards during processing:**Components with general dust limit**

MAK (TRGS 900) (Germany)	Short-term value: 2.5 A 20 E mg/m ³ Long-term value: 1.25 A 10 E mg/m ³ A - IFA 6068 (2003) E - IFA 7284 (2003)
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A - Alveoles passing particles E - Respirable particles (DIN EN 481)

Additional information:

The lists valid during the making were used as basis.

8.2 Exposure controls**8.2.1. Personal protective equipment****General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed. Remove contaminated clothing immediately and thoroughly clean it before using it again. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin. Do not eat, drink, smoke or sniff while working. Use skin protection cream for skin protection. Ensure that washing facilities are available at the work place.

Respiratory protection:

Particle filtering half mask (FFP2 according to EN 149)

Compliance with the Occupational Exposure Limits is to be ensured through effective dust-technical measures, such as local exhaust ventilation. If there is a risk of exceeding the exposure limits, e. g. the open fiddling with the powdered dry product or during processing by splash, an appropriate respirator must be used.

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Protection of hands:

Hand protection: Chemical resistant protective gloves according EN 374

Wear waterproof, abrasion and alkali-resistant protective gloves with CE marking. leather gloves are not suitable on the basis of their water permeability and can release chromate-containing compounds.

Material of gloves:

When preparing and processing the ready-mix, no chemical-resistant gloves (Cat. III) are necessary. Studies have shown that nitrilge-soaked cotton gloves (layer thickness about 0.15 mm) offer over a period of 480 min adequate protection. Change damp gloves. Keep gloves ready for change.

Penetration time of glove material:

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

For the permanent contact gloves made of the following materials are suitable:

Nitrile rubber, NBR gloves

Recommended thickness of the material: $\geq 0,15\text{mm}$

Not suitable are gloves made of the following materials:

Leather gloves

Eye protection:

In case of dust development or splash risk use tightly fitting safety goggles according to EN 166.

Body protection:

Wear closed long-sleeved clothing and tight shoes. If contact with fresh mortar is unavoidable, the protective clothing should also be waterproof. Make sure that no fresh mortar from above gets into the shoes or boots.

Risk management measures:

An operator training/guidance in the correct use of personal protective equipment is necessary to ensure the required level of effectiveness.

8.2.2. Information about design of technical facilities

For reduction of the dust formation, closed systems (e. g. silo with conveyor) local exhaust or other engineering controls such as plastering machines or continuous mixers with special additional equipment for dust detection should be used.

8.2.3. Limitation and supervision of exposure into the environment

Do not allow product to reach water because an increase of pH may be caused. Ecotoxicological effects may occur when the pH-value is above 9. National regulations for waste water and groundwater are to be observed.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance:

Form:	Powder
Colour:	Light grey
Odour:	Odourless
Odour threshold:	Not safety relevant

pH-value at 20 °C (68 °F):	> 11 Saturated aqueous solution
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Change in condition

Melting point/freezing point:	> 1,300 °C (> 2,372 °F)
Initial boiling point and boiling range:	Not applicable

Flash point:	Not applicable
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Flammability (solid, gas):	Product is not flammable.
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Ignition temperature:	Not applicable
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Decomposition temperature:	>825°C to CaO and CO ₂
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Auto-ignition temperature:	Product is not selfigniting.
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Oxidising properties:	None
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Explosive properties:	Product does not present an explosion hazard.
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Density:	Not determined
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Bulk density:	1,400 - 1,600 kg/m ³
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Solubility in / Miscibility with Water:	Slightly soluble
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Solvent content:

Organic solvents:	0.3 %
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Solids content:	100.0 %
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9.2 Other information	No further relevant information available.
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SECTION 10: Stability and reactivity

10.1 Reactivity

Reacts alkaline with water. A proposed reaction takes place in contact with water, during which the product hardens and forms a solid mass, which does not react with the environment.

10.2 Chemical stability:

The product is stable as long as it is stored properly and dry.

Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

10.3 Possibility of hazardous reactions

No dangerous reactions known (see 10.5).

10.4 Conditions to avoid

Prevent entry of water and moisture during storage (the mixture reacts with moisture alkaline and hardens).

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10.5 Incompatible materials

Reacts exothermically with acids. The wet product is alkaline and reacts with acids, ammonium salts and base metals e.g. aluminum, zinc or brass. The reaction with base metals produces hydrogen.

10.6 Hazardous decomposition products

No decomposition if used and stored according to specifications.

Minimum storage life:

Minimum storage life (store dry, up to 20°C): See indication on package.

Additional information:

The mixture is chromate reduced. The ready for use preparation after addition of water contains in maximum 2 mg/kg dissolvable chrom(VI) related to the dry mass. Presupposition for the chromate reduction is the appropriate storage under consideration of the maximum storage life.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

The product was not investigated. The statement is derived from the properties of the single components.

Acute toxicity:

Based on available data, the classification criteria are not met.

LD/LC50 values relevant for classification:**1317-65-3 Limestone (Calcium carbonate)**

Oral	LD ₅₀	6,450 mg/kg (Rat) (RTECS Data)
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65997-15-1 Portland cement clinker

Oral	LD ₅₀	> 2,000 mg/kg (Mouse) Bei Tierstudien mit Zementsäuben wurde keine akute Toxizität festgestellt. Aufgrund der vorliegenden Daten gelten die Einstufungskriterien als nicht erfüllt.
Dermal	LD ₀ (no lethality)	2,000 mg/kg (Rabbit) (Limit test 24h [4]) On the basis of the available data, the classification criteria are not fulfilled.
Inhalative	LD ₀ (no lethality)	5 mg/m ³ (Rat) (Limit test [10]) On the basis of the available data, the classification criteria are not fulfilled.

122-99-6 2-Phenoxyethanol

Oral	LD ₅₀	1,260 mg/kg (Rat)
Dermal	LD ₅₀	5,000 mg/kg (Rabbit)

Primary irritant effect:**On the skin:**

Cement has a skin and mucous 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 skin reactions, e. g. As redness and cracking. Prolonged contact in combination with abrasion can cause serious skin damage, see section 16 literature [4].

Causes skin irritation.

On the eye:

In the in vitro test showed Portland cement clinker varying degrees of impact on the cornea. The calculated "irritation index" is 128. Direct contact with cement may lead by mechanical reaction, irritation and inflammation to corneal damage. Direct contact with larger amounts of dry or wet cement may cause effects ranging from moderate eye irritation to serious eye damage and blindness, see Section 16 References [11] and [12].

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Causes serious eye damage.

Sensitization:

May cause an allergic skin reaction.

Subacute to chronic toxicity:

The contact with wet cement may cause skin eczema on some individuals. This can be triggered either by the pH (irritant contact dermatitis) or by immunological reaction of water soluble chromium(VI) (allergic contact dermatitis), see section 16 literature [5] and [13].

Germ cell mutagenicity:

Based on available data, the classification criteria are not met.

Carcinogenicity:

Based on available data, the classification criteria are not met.

Reproductive toxicity:

Based on available data, the classification criteria are not met.

Specific target organ toxicity - single exposure (STOT SE):

Cement dust exposure may cause irritation of the respiratory system. Coughing, sneezing, and shortness of breath may be the result if exposure above the occupational exposure limit, see Section 16 References [1].

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (STOT RE):

Long term exposure to respirable dust in excess of occupational exposure limit may result in coughing, shortness of breath and chronic obstructive changes in the respiratory tract. At low concentrations, no chronic effects were observed, see section 16 literature [17]. Based on the available data, the classification criteria are not fulfilled.

Cement may aggravate existing skin disorders, eye and respiratory tract, e. g. with emphysema or asthma.

Frequent inhalation of large amounts of dust increases the risk of developing lung diseases.

Aspiration hazard:

Based on available data, the classification criteria are not met.

11.2 Practical experience

No further relevant information available.

11.3 General comments

See section 16 (literature and references).

SECTION 12: Ecological information

12.1 Toxicity

The product was not investigated. The statement is derived from the properties of the single components.

Aquatic toxicity:

1317-65-3 Limestone (Calcium carbonate)

LC₅₀ (96h) > 100 mg/l (Rainbow trout - oncorhynchus mykis) (OECD 203)

LC₅₀ (48h) > 100 mg/l (Water flea - daphnia magma) (OECD 202)

EC₅₀ > 14 mg/l (Algae - desmodesmus subspicatus) (OECD 201)

> 1,000 mg/l (Activated sewage sludge) (OECD 209)

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LC₅₀ mg/l (Water flea - daphnia magma) (low effect [6,8])

mg/l (Algae - selenastrum coli) (low effect [7,8])

mg/l (Sediments) (low effect [9])

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12.2 Persistence and degradability

Anorganic product, is not removable from water by biological cleaning process

12.3 Bioaccumulative potential

Does not accumulate in organisms

12.4 Mobility in soil

Slightly soluble

Ecotoxic effects:

Only by increasing the pH value during application of large quantities.

Behaviour in sewage processing plants:

No further relevant information available.

Type of test Effective concentration Method Assessment

No further relevant information available.

Remark:

Ecotoxicological tests with Portland cement on *Daphnia magna* (US EPA, 1994a, see Section 16 References [6]) and *Selenastrum Coli* (US EPA, 1993, see section 16 literature [7]) have shown little toxicological effect. Therefore, the LC50 and EC50 values could not be determined, see section 16 literature [8]. There were also no toxic effects on sediments are found, see section 16 literature [9]. The addition of large quantities of cement in water can cause a pH increase and thus be toxic to aquatic life under special circumstances.

Additional ecological information:**General notes:**

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

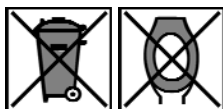
12.5 Results of PBT and vPvB assessment**PBT:** Not applicable.**vPvB:** Not applicable.**12.6 Other adverse effects**

No further relevant information available.

Literature

See section 16 (literature and references).

SECTION 13: Disposal considerations

13.1 Waste treatment methods**Recommendation:**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

Gather dry, store in labeled containers and re-use if possible, taking into account the maximum storage time or mix residual amounts while avoiding any skin contact and exposure to dust with water. Moisture products or product slurry to harden and dispose of according to local regulatory regulations.

European waste catalogue

16 03 03*	Inorganic wastes containing hazardous substances
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17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
15 01 01	Paper and cardboard packaging
HP 4	Irritant - skin irritation and eye damage
HP 5	Specific Target Organ Toxicity (STOT)/Aspiration Toxicity
HP 13	Sensitising

16 03 03 for residual amounts of unprocessed product
17 09 04 for the water mixed and setted product
15 01 01 for the completely emptied packaging

13.2 Uncleaned packaging**Recommendation:**

Disposal must be made according to official regulations.
Recycle only completely emptied packaging.

SECTION 14: Transport information

14.1 UN-Number ADR, ADN, IMDG, IATA	Void
14.2 UN proper shipping name ADR, ADN, IMDG, IATA	Void
14.3 Transport hazard class(es) ADR, ADN, IMDG, IATA Class	Void
14.4 Packing group ADR, IMDG, IATA	Void
14.5 Environmental hazards Marine pollutant:	No
14.6 Special precautions for user	Not applicable
14.7 Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable
UN "Model Regulation":	Void

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****Directive (EU) 2012/18****Named dangerous substances - ANNEX I :**

None of the ingredients is listed.

National regulations:**Biozide ingredients (98/8/EG):**

Data based on recipe and information on the raw materials from the supply chain.

None of the ingredients is listed.

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Waterhazard class:

Water hazard class 1 (Self-assessment): slightly hazardous for water.

Other regulations, limitations and prohibitive regulations:

·Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

·Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006

·Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations

·Commission regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

·Regulation (EC) 1013/2006 on shipments of waste

·REACH Regulation EC 1907/2006 (REACH), Annex XVII No. 47 (chromium VI - compounds).

·Technical Rules for Hazardous Substances 900 - Workplace exposure limits (TRGS 900, Germany)

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Reasons for changes:

* Data compared to the previous version altered.

Relevant phrases:

H302 Harmful if swallowed.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H335 May cause respiratory irritation.

Advice for instructions:

Additional trainings, which go beyond the prescribed training in activities involving hazardous substances are not required.

Literature and the 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 Nr.29 S.605.

[3] MEASE 1.02.01 Exposure assessment tool for metals and inorganic substances, EBRC Consulting GmbH für Eurometaux, 2010

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

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[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 (European Commission, 2002): http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf.

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Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

MAK: Maximale Arbeitsplatz-Konzentration (maximum concentration of a chemical substance in the workplace, Austria/Germany)

PBT: persistent, bioaccumulative and toxic properties

vPvB: very persistent, bioaccumulative properties

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

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PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
Skin Sens. 1: Skin sensitisation – Category 1
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

Further information:

The information in this safety data sheet describe the safety requirements of our product and is based on our current state of our knowledge. They provide no assurance of product quality. Existing laws, ordinances and regulations, including those that are not mentioned in this data sheet must be observed by the recipient of our products in their own responsibility.

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