

1 Substance / preparation label and company name

1.1 Product information

Portland-composite cement TioCem[®] CEM II/A-S 42,5 R (tx)

1.2 Use of the preparation

TioCem[®] is a hydraulic binder used for the production of mortar and concrete etc. by mixing water and rock aggregates.

1.3 Name of the company

Producer /supplier: HeidelbergCement AG, Zementwerk Leimen

street/P.O. Box: Rohrbacher Str. 95

country/postcard/town: 69181 Leimen

telephone: 06224 / 703 - 0

fax: 06224 / 703 – 238

Information supplying unit: department of quality assurance

telephone: 06224 / 703 – 230

e-mail: sdb-z@heidelbergcement.com

1.4 Emergency number

Mainz Poison Control Center (open 24 hours)

telephone: 06131 / 19240

2 Possible risks

A very alkaline solution is produced when cement reacts with water or becomes wet (like the production of fresh concrete or fresh mortar).

2.1 Classification of the preparation:

Xi irritant

R 37/38 provokes the respiratory organs and the skin

R 41 risk of serious damage to eyes

2.2 Expositions ways

Inhalation: Yes

Skin – eyes: Yes

Absorption of nutrients: No, except by accident

2.3 Possible injurious effects on the person

Inhalation: Repeated inhalation of large amounts of cement dust over a long period of time raises the risk for illnesses of the lung.

Eyes: Contact with cement (dry or wet) can cause serious and possibly permanent injury to eyes.

Skin: With prolonged contact, cement can be irritating to wet skin (due to perspiration or humidity). Extended contact with wet cement, fresh concrete or mortar (e.g., with the knees in wet mortar or concrete, even if long trousers are worn) can cause skin irritation, dermatitis or serious skin injury. Such skin injury develops without any initial sensation of pain. For more details, see (1).

2.4 Possible injurious effects on the environment

By normal use the preparation (cement) counts as not dangerously to the environment.

2.5 Other information

The preparation (cement) is low in chromium, either inherently or because the content of sensitizing chromium (VI) has been lowered with a reducing agent to below 0.0002 % in the cement portion of the cement that is ready for use. Proper storage and compliance with the expiration date is a prerequisite for the effectiveness of the chromate reduction (see 7.2 and 15).

3 Information about composition/components

3.1 Chemical characteristics of the preparation

TioCem[®] CEM II/A-S 42,5 R (tx) is a hydraulic binder according to the German Institute for Standardization EN 197-1 and includes:

Portland cement clinker	80 – 94 weight-%
Granulated blast furnace slag	6 – 20 weight-%
Calcium sulphate (gypsum/hemi hydrate/anhydride)	0 – 7 weight-%
Titanium dioxide	< 5 weight-%
Cement additive	< 1 weight-%

3.2 Hazardous components

Identification	CAS-No.	EC-No.	Concentration area [weight-%]	R-sentences	Hazard symbol
Portland cement clinker	65997-15-1	266-043-4	80 - 94 %	37; 38; 41; 43	Xi

The text of the performed R-sentences is to be taken from point 16.

4 First aid measures

If you have to call on a doctor, do not forget to present this safety data sheet.

4.1 After inhalation

Provide fresh air. Dust from neck and nasal area should be removed fast. With discomfort like indisposition, cough or persistent irritation consult doctor.

4.2 After skin contact

Dry cement remove and with richly water rinse. Humid cement with a lot of water rinse. Waterlogged clothes, shoes, watches etc. remove. These clean before re-use thoroughly. With skin discomfort consult doctor.

4.3 After eye contact

Do not rub eyes dry, because the mechanical stress can cause additional corneal injury. Also, remove contact lenses and immediately irrigate the eye under running water, holding the eyelid open, for at least 45 minutes to remove all particles. If possible, use an isotonic eye wash (0.9% NaCl). Always consult an occupational physician or ophthalmologist.

4.4 After swallowing

When being conscious, rinse out the mouth and drink a lot of water. Do not cause vomiting and contact a doctor or Poison Control Center.

5 Fire-fighting measures

5.1 Suitable fire extinguishing agents

The product is not combustible or explosive in delivery condition or mixed with water in processing-ready condition. Extinguishing agents and fire-fighting measures are to be adapted to ambient fire.

5.2 Unsuitable extinguishing media

None.

5.3 Special exposure hazards arising from the preparation, its combustion products or from gas

None.

5.4 Special protection equipment while the fire-fighting

No special measures are necessary, because cement rescues no fire relevant danger.

6 Measures in case of unintentional release

6.1 Personal protective measures

Wear personal protective clothing (see 8.2). Follow instructions for safe handling under 7.1. No emergency plan is necessary.

6.2 Environment protection measures

Avoid uncontrolled entry of the preparation into sewage water system, surface water or ground water.

6.3 Procedures for cleaning

Collect the spilled cement, dry when possible.

Dry cement:

For cleanup, use dry methods where possible that do not generate dust, such as an industrial vacuum cleaner with a suitable filter, or wet the cement and remove as for wet cement. If dust is generated during dry cleanup, personal protection equipment must be used.

Wet cement:

Collect wet cement mechanically, allow to harden on a film underlay or in a container and dispose of as described under section 13.

7 Handling and storage

Do not store or use in the vicinity of food, beverages or tobacco products.

7.1 Handling

Follow the recommendations under section 8. Avoid dust formation.

For bagged goods and when using open mixing containers, first fill with water, then carefully add the dry cement. Maintain low drop height. Start stirrer slowly. Do not compress empty bags together, or do so only in a clean over bag.

Carrying cement bags can cause injury to the back, arms, shoulders and legs. Care must be taken during handling.

7.2 Storage

Always store in original container.

Store loose cement in silos that are dry (minimize internal condensation), water-tight, clean, and protected against impurities.

Do not enter cement storage spaces such as silos, tanks, tanker trucks or other containers without proper safety precautions; it is possible to become buried and suffocate. In such enclosed spaces, cement can form walls and bridges that can collapse unexpectedly.

Packaged products must be kept in unopened bags on the floor, under cool, dry conditions and not subjected to strong drafts to avoid loss of quality. Bags must be stored in a sturdy manner.

7.3 Control of water-soluble chromium (VI) content

It must be noted that the effectiveness of the reducing agent in cements containing chromate reducers decreases over time. Cement bags and/or delivery documents thus indicate the minimum effectiveness period. Within this period, the level of water-soluble chromium (VI) remains below 0.0002 % (as determined according to EN 196-10). Follow the manufacturer's instructions on proper storage. Improper storage (admission of moisture) or overlap can cause the chromate reducer to lose its effectiveness prematurely so that a sensitizing effect of the cement in case of skin contact cannot be ruled out.

8 Limitation of the exposition and personal protective equipment

8.1 Exposition limit value

Identification	Limit Value	Exposure route	Exposure frequency	Remarks
Water-soluble chromium (VI)	2 ppm %	dermal	short-term (acute) long-term (repeated)	EN 196-10
Portland cement: General dust limit value:	5 (E) mg/m ³ 3 (A) mg/m ³ 10 (E) mg/m ³	inhalative	short-term (acute) long-term (repeated)	TRGS 900 (2)

8.2 Limitation and supervision of the exposition

8.2.1 Limitation and supervision of the exposition at work

General protection and hygiene measures:

Avoid contact with eyes and skin. Do not kneel or stand in fresh mortar or concrete if possible during processing. If this is required nonetheless, suitable waterproof protective clothing is absolutely mandatory.

Change saturated clothing immediately.

Do not eat, drink or smoke when working with this substance. Wash hands and, if necessary, shower, before breaks and after completing work to remove adherent cement dust.

Clean contaminated clothing, shoes, watches, etc., before using again.

Respiratory equipment:

When exposition limit values are exceeded (e.g. possibly during cleaning operations) use particle filtering half masks FFP1 (white). (see at leaflet BGR 190³).

Hand protection:

Wear waterproof, abrasion- and alkali-resistant protective gloves. Nitrile-impregnated cotton gloves bearing the CE mark (see specification BGR 195 (3)), for example, are suitable. Pay attention to the maximum time of wear. Leather gloves are not appropriate because of the water permeability.

Eye protection:

Because of dust development or splash risk use tightly closing protective goggles according to EN 166.

Skin protection:

Protect skin according to skin protection plan following leaflet BGR 197³. Especially use skin care products after work.

Body protection:

Wear closed long-sleeved protective clothes and tight shoes. If contact with fresh mortar and concrete is unavoidable, the protective clothing should also be waterproof. It must be ensured that no fresh mortar or concrete enters the shoes or boots from above.

8.2.2 Limitation and supervision of exposition and environment

According to the available technology.

9 Physical and chemical properties**9.1 General information**

Appearance / form:	Powder
Colour:	Gray-beige
Smell:	Inodorous

9.2 Important data to the health and environmental protection as well as safety

Parameter	Value / range	Unit / method / note
pH-value (T=23 °C)	11,0-13,5	In mixed form and during appropriate use (e.g. as cement paste, mortar or concrete).
Mean particle size	5 – 30	µm
Melting range	> 1.250	°C
Flash point	Not applicable.	Solid material inflammable / does not burn
Explosion risk	No explosion risk.	
Density	2,75 - 3,20	g/cm ³
Bulk density (T=20°C)	0,8 - 1,8	g/cm ³
Water solubility (T=20°C)	low - ca. 0,1 – 1,5	g/l

No other physical-chemical parameters listed in Annex II of Directive (EC) 1907/2006 are relevant.

10 Stability and reactivity**10.1 Stability**

Dry cement is stable, as long as it is stored properly (section 7), and is compatible with most other building products. Properly mixed with water, cement hardens and forms a solid mass that does not react with its environment.

10.2 Conditions to be avoided

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

10.3 Materials to be avoided

Uncontrolled use of aluminum powder in wet cement should be avoided since hydrogen is released.

10.4 Hazardous decomposition products

Dangerous decomposition products are not known.

11 Information about toxicology

11.1 Acute toxicity

Eye contact:

Direct contact with cement can cause corneal damage, both due to mechanical effect and an immediate or subsequent irritation or inflammation. Direct contact with large quantities of dry cement or wet cement spatter can have consequences ranging from moderate eye irritation (e.g., conjunctivitis or eyelid inflammation) to serious eye damage and blindness.

Skin contact:

Cement is an irritant to skin and mucous membranes. Dry cement in contact with moist skin or skin in contact with moist or wet cement can lead to various irritative and inflammatory skin reactions, e.g., reddening or cracking. Prolonged contact in connection with mechanical abrasion can lead to serious skin damage.

Acute dermal toxicity:

Limit test, rabbit, 24-hour exposure, 2,000 mg/kg body weight – no lethality (4).

Swallowing:

Swallowing large quantities can cause irritation of the gastrointestinal tract.

Inhalation:

Exposure to cement dust can irritate the respiratory tract (throat, neck, lungs). Coughing, sneezing and shortness of breath can result if the exposure is above the workplace limit value.

11.2 Chronic effects

Inhalation:

Long-term exposure to respirable cement dust above the workplace limit value can lead to coughing, shortness of breath and chronic obstructive changes to the airways.

Carcinogenicity:

A causal relationship between cement exposure and cancer has not been established (1).

Contact dermatitis/sensitizing effect:

In some individuals, eczema can form after contact with wet cement. This is triggered either by the pH value (irritative contact dermatitis) or by immunological reactions with water-soluble chromium (VI) (allergic contact dermatitis) (5). The skin reaction can take various forms, from a mild rash to a true dermatitis, and is the result of a combination of both mechanisms. An exact diagnosis can often be made only with difficulty. The water-soluble chromium (VI) content must therefore be reduced to less than 0.0002 % using a suitable reducing agent. As long as the minimum expiration date of the chromate reducer is not exceeded, no sensitizing effect is to be expected (6).

11.3 Medical effects of an exposure

The inhalation of cement dust can exacerbate existing illness or impairment of the respiratory organs such as asthma or emphysema. Contact with cement dust can exacerbate existing skin or eye diseases.

12 Environment-related information

12.1 Eco-toxicity effects

The product is not considered hazardous to the environment. Ecotoxicological studies with Portland cement on *Daphnia magna* (U.S. EPA, 1994a) (7) and *Selenastrum coli* (U.S. EPA, 1993) (8) have shown only a slight toxic effect. The LC50 and EC50 values could therefore not be determined (9). No toxic effects on sediments could be established (10). The release of large quantities of cement in water can, however, cause a shift in pH levels and therefore be toxic to aquatic life under certain circumstances.

12.2 Mobility

Dry cement is not volatile. However, handling can stir up ultra-fine particles can remain as suspended particles in the air.

12.3 Persistence and biodegradability bioaccumulation, other injurious effects

Not applicable since cement is an inorganic mineral material.

13 Waste disposal remarks

13.1 Product past reducing agent expiration date

and with water-soluble chromium (VI) content greater than 0.0002 %:

The product may no longer be used or put on the market unless used in controlled, enclosed and fully automated processes or is re-treated with chromate reducer.

13.2 Disposal of unused dry product

Pick up under dry conditions. Mark the container. Continue use where possible, avoiding dust exposure (observe expiration date). For disposal, harden fully with water and dispose of as instructed under section 13.4.

13.3 Wet product and product slurries

Allow wet product and product slurries to harden fully and do not release into the sewer system or bodies of water. Disposal as defined under section 13.4.

13.4 Product that has hardened after addition of water

Dispose of according to local laws and official guidelines. Do not release into the sewer system. Disposal of the fully hardened product, such as concrete waste and concrete slurry.

Waste code under AW: depending on origin, 17 01 01 or 10 13 14.

Waste designation under AW: 17 01 01: concrete; 10 13 14: concrete waste and concrete slurry.

13.5 Uncleaned packaging

Empty packaging completely and recycle. Otherwise, dispose of under waste code AW: 15 01 01 (paper waste and cardboard packaging).

14 Transport instruction

Cement is not subject to the international hazardous goods regulations (IMDG, IATA, ADRIRID). No classification is therefore required.

15 Statutory regulations


15.1 EU laws

15.1.1 Chemical safety assessment

A chemical safety assessment is not required since cement is a preparation.

15.1.2 Identification

Classification and designation under EU Directive 1999/45/EC

<i>Danger symbol and identification letter:</i>	Xi	
<i>Danger indication:</i>	Irritant	
<i>R-phrases:</i>	R 37/38	Irritate the respiratory system and the skin,

	R 41	Risk of serious eye damage.
<i>S-phrases:</i>	S 2	May not reach in the hands of children.
	S 22	Do not inhale the dust.
	S 24/25	Avoid skin and eye contact.
	S 26	In case of eye contact wash off immediately and thoroughly with abundant water and contact the doctor.
	S 36/37/39	Wear suitable protective clothes, gloves and goggles/ facial protection at work.
	S 46	After swallowing immediately contact the doctor and show packing or label.

15.2 Approval and/or usage restrictions

According to Annex XVII Paragraph 47 of EC Directive 1907/2006, there is a ban on use and placing on the market of cement and preparations containing cement if the level of chromium (VI) after hydration is greater than 0.0002 % of the dry mass of the cement. Exceptions apply only for monitored, enclosed and fully automated processes and for use in such processes, in which cement and preparations containing cement come in contact exclusively with machines and there is no risk of skin contact.

15.3 National regulations

References to the employment limitations: Not relevant.

GISCODE: ZP 1 (zementhaltige Produkte, chromatarm)

Water endangering class: WGK 1 (slightly water endangering), self classification according to the Administrative Regulation on the Classification of Substances Hazardous to Water into Water Hazard Classes (VwVwS) as of 17.05.1999

Other regulations, limitations and prohibiting orders: Hazard material regulation

Ordinance of banned chemicals

Storage class: VCI storage class 13 (flammable solid material)

16 Further information

16.1 Wording of the R-phrases (item 2 and 3)

R 37/38 Irritate the respiratory organs and the skin.

R 41 Risk of serious eye damage.

R 43 May cause sensitization by skin contact

16.2 Data sources

- (1) Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006. siehe: <http://www.hse.gov.uk/pubns/web/portlandcement.pdf>
- (2) <http://www.baua.de/prax/>
- (3) <http://www.hvbg.de/d/praev/vorschr/index.html>

- (4) Anmerkungen zu hautirritierenden Wirkungen von Zement, 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) 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).
- (7) 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).
- (8) 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).
- (9) 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.
- (10) Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyGen Ecotox AS, 2007.

16.3 Abbreviations:

- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transport Association
- ADR/RID: Agreement on the transport of dangerous goods by road/Regulations on the international transport of dangerous goods by rail
- LC50: Median lethal concentration, at which 50% of the test population is killed
- EC50: Median effective concentration, at which 50% of the test population shows a defined effect
- BGR: Berufsgenossenschaftliche Regel für Sicherheit und Gesundheit (professional association health and safety regulation)
- AVV: Abfallverzeichnisverordnung (waste management act)

16.4 Other notes:

Under Article 6 (3) RL 1999/45/EC, the classification of cement as R43 is eliminated, since the sensitizing effect of cement based on antagonistic effects (chromium (VI) and reducing agent) has been overestimated according to conventional assessment.

16.5 Changes since the previous version:

Change of the cement naming.

16.6 Further particulars:

The information given in this safety data sheet describes the safety requirement of our product and based on our present knowledge. However, this shall not constitute a guarantee for any specific product features. It is the responsibility of the user of our products to know and comply with all applicable laws, regulations and rules relating to the respective product, even those that are not specifically mentioned in this safety data sheet.

16.7 Data sheet issuing range:

Look at item 1.3.