Safety Data Sheet

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1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

According to legislation of Republic Serbia:
Portland cement:
PC 52,5 N
PC 42,5 R

Portland composite cement:
PC 20M(S-L) 42,5 R
PC 35M(V-L) 42,5 R
PC 35M(V-L) 42,5 N
PC 35M(V-L) 32,5 R

According to EU legislation:
Portland cement:
CEM I 52,5 N
CEM I 42,5 R

Portland composite cement:
CEM II/A-M(S-L) 42,5 R
CEM II/B-M(V-L) 42,5 R
CEM II/B-M(V-L) 42,5 N
CEM II/B-M(V-L) 32,5 R

1.2 Relevant identified uses of the subsance or mixtures and uses advised against

Cements are used in industrial installations to manufacture/formulate hydraulic binders for building and construction work, such as ready-mixed concrete, mortars, renders, grouts, plasters as well as precast concrete.
Common cements and cement containing mixtures (hydraulic binders) are used industrially, by professionals as well as by consumers in building and construction work, indoor and outdoor. The identified uses of cements and cement containing mixtures cover the dry products and the products in a wet suspension (paste).

1.3 Details of the supplier of the safety data sheet

Company name: TITAN CEMENTARA KOSJERIĆ DOO
Full address: Živojina Mišića 50, 31260 Kosjerić
Telephone number: +381 31 590-303
E-mail address of competent person responsible for the SDS: kantonijevic@titan.rs

1.4 Emergency telephone number

Emergancy telephone number: +381 (0)31-590-420 (working days from 7 until 15h)
Poison Center: 011/3609640

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification of the substance is made in accordance with Regulation on classification, packing, marking and promoting of chemicals and certain products in accordance with globally harmonized system for classification and marking UN (”Official Gazette of RS”, No 105/2013, 52/2017).

Skin irritation, category 2, H315
Skin sensitization, category 1, H317
Serious eye damage, category 1, H318
Specific toxity for targeted organ- single exposure, category 3, H335

2.2 Label elements

Labelling of chemicals is made in accordance with Regulation on classification, packing, marking and promoting of chemicals and certain products in accordance with globally harmonized system for classification and marking UN (”Official Gazette of RS”, No 105/2013, 52/2017).

Danger

H318 – Leads to serious eye damage
H315 – Causes skin irritation
H317 - May cause alergic skin reactions
H335 – May cause respiratory irritation

P102 Keep out of reach of children
P280 Wear suitable protective clothing, gloves and eye/face protection
P305+P351+P388 IN CASE WITH CONTACT WITH EYES: Carefully rins with water for several minutes. Remove the contact lenses, if present and possible. Continue with rinsing.
P310 Urgently call Poison Control Center or seek medical advice.
P302+P352 IN CASE OF SKIN CONTACT: Rinse with lot soap and water.
P333+P313 In case of skin irritation or rash: Seek for medical advice/opinion.
P261 Avoid inhalation of dust/smoke/gas/fog/vapours/spray.
P304+P340 IF INHALED: Carry out injured person on fresh air and ensure to rest in a position which does not impede breathing.

P312 Call Poison Centre or talk to you doctor if you do not feel well.
P501 Dispose content / container at designated collection point for waste.

2.3 Other hazards

Cement does not meet the criteria for identification as PBT or vPvT chemicals.
Cement may contain Cr^{+6} , which, if found in trade after expiration date ie upon the cessation of a reducing agent, may cause alergic reaction.
Shipped product in bulk may contain soluble Cr^{+6} whic, in contact with skin may cause alergic reaction.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Information on substance ingredients

Not relevant.

3.2 Information on mixture ingredients

Substance	Conc. Range, %	CAS number	EC number	According to CLP/GHS
Portland cement clinker	65-100	65997-15-1	266-043-4	Serious eye damage 1, H318; Skin irritation 2, H315; Skin sens. 1, H317; TCOJ 3, H335

4. FIRST AID MEASURES

4.1 Description of first aid measures

General notes
No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet cement or wet cement containing preparations.

Following contact with eyes
Do not rub eyes in order to avoid possible corneal damage by mechanical stress.
Remove contact lenses if any. Incline head to injured eye, open the eyelids widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for at least 20 minutes to remove all particles. Avoid flushing particles into uninjured eye. If possible, use isotonic water (0.9% NaCl). Contact a specialist of occupational medicine or an eye specialist.

Following skin contact
For dry cement, remove and rinse abundantly with water.
For wet/damp cement, wash skin with plenty of water.
Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them.
Seek medical treatment in all cases of irritation or burns.

Following inhalation
Move the person to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops or if discomfort, coughing or other symptoms persist.

Following ingestion
Do not induce vomiting. If the person is conscious, wash out mouth with water and give plenty of water to drink. Get immediate medical attention or contact the anti-poison center.

4.2 Most important symptoms and effects, both acute and delayed

Eyes: Eye contact with cement dust (dry or wet) may cause serious and potentially irreversible injuries.
Skin: Cement may have an irritating effect on moist skin (due to sweat or humidity) after prolonged contact or may cause contact dermatitis after repeated contact. Prolonged contact between cement dust and moist skin may cause irritation, dermatitis or burns.

***Inhalation*:** Repeated inhalation of cement dust over a long period of time increases the risk of developing lung diseases.
Swallowing: Do not swallow cement. Swallowing the small amount of cement does not have to be harmful, the introduction of large quantities may cause burns in mouth, throat and other digestive organs.

4.3 Indication of any immediate medical attention and special treatment needed

Clinical testing and medical monitoring of differed effects that chemical can cause, antidote and contraindications: Not available.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Cement is not flammable.

5.2 Special hazards arising from the substance or mixture

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

5.3 Advice for fire-fighters

Cement poses no fire-related hazards. Wear suitable protective clothing, gloves and eye/face protection, breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear protective equipment as described under Section 8 and follow the advice for safe handling and use given under Section 7.

6.1.2 For emergency responders

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

6.2 Evironmental precautions

Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).

6.3 Methods and material for containment and cleaning up

In case of dispersion of portland cement, clean up the material and place it in a container. Use cleanup methodes which do not cause airborne dispersion of cement dust and contact with skin. Wear the appropriate personal protective equipment as described in Section 8. In case of setting of spilled material, scrape off and place it in a container.
Avoid entry of portland cement in sewage and drainage systems or into bodies of water.
If not contaminated by other materials, portland cement could be reused. Dispose of according to the local legislation.

6.4 Reference to other sections

See sections 8 and 13 for more details.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Safe handling of chemicals
Follow the recommendations as given under Subsection 8.2.
Measures to prevent spreading
To clean up dry cement, see Subsection 6.3
Measures to prevent fire
Not applicable.
Measures to prevent aerosol and dust generation
Do not sweep. Use dry cleanup methods such as vacuum clean-up or vacuum extraction, which do not cause airborne dispersion..
Measure to protect the environment
No particular measures.

Instructions on the general hygiene in the work place

Do not handle or store near food and beverages or smoking materials.
Wash hands after use of materials.

7.2 Conditions for safe storage, including any incompatibilities

Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.
Cement in bags should be stored in a dry room, protected from moisture. If it has to be kept in the open, cement bags should be placed on the dry variety, properly covered to prevent atmospheric influences. In order to reduce soluble Cr^{6+} reducing agent is added. Upon the expiration date of the cement, it is possible to return it to the production where re-execution of the Cr^{6+} reduction can be done again in order to reuse material.
Do not use aluminum containers due to incompatibility of the materials.

7.3 Specific end use(s)

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

For cement dust the TLV (total inhalable dust) is:

5 mg/m^3 - for respirable dust
15 mg/m^3 - for total dust

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Measures to reduce generation of dust and to avoid dust propagating in the environment such as dedusting, exhaust ventilation and dry clean-up methods which do not cause airborne dispersion.

8.2.2 Individual protection measures such as personal protection equipment

General: Do not eat, drink or smoke when working with cement to avoid contact with skin or mouth.
Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them.

Eye/face protection

Wear approved glasses or safety goggles when handling dry or wet cement to prevent contact with eyes.

Skin protection

Use appropriate waterproof protecting gloves, clothing and shoes to protect the skin from direct contact with portland cement. Do not use skin care products as a replacement for waterproof gloves. Remove contaminated clothing, protective equipment and clean thoroughly exposed skin with water.

Respiratory protection

When a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection.

Thermal hazards

Not applicable.

8.2.3 Environmental exposure controls

Environmental exposure control for the emission of cement particles into air has to be in accordance with the available technology and regulations for the emission of general dust particles.
No special emission control measures are necessary for the exposure to the terrestrial environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

(a) Appearance: Cement is a grey or white, granular inorganic solid material
(b) Odour: Odourless
(c) Odour threshold: no odour threshold, odourless
(d) pH: (T = 20°C in water, water-solid ratio 1:2): 11-13.5
(e) Melting point/freezing point: not available
(f) Initial boiling point and boiling range: Not applicable as under normal atmospheric conditions, melting point >1 250°C

(g) Flash point: Not applicable as is not a liquid
(h) Evaporation rate: Not applicable as is not a liquid

(i) Flammability (solid, gas): Not applicable as is a solid which is non-combustible and does not cause or contribute to fire through friction
(j) Upper/lower flammability or explosive limits: Not applicable as is not a flammable gas

(k) Vapour pressure: Not applicable as melting point > 1250 °C
(l) Vapour density: Not applicable as melting point > 1250 °C
(m) Relative density: 2.75-3.20; Apparent density -: 0.9-1.5 g/cm³
(n) Solubility(and) in water: not available
(o) Partition coefficient: n-octanol/water: Not applicable as is inorganic substance
(p) Auto-ignition temperature: Not applicable (no pyrophoricity – no organo-metallic, organo-metalloid or organo-phosphine bindings or of their derivatives, and no other pyrophoric constituent in the composition)
(q) Decomposition temperature: Not applicable as no organic peroxide present
(r) Viscosity: Not applicable as not a liquid
(s) Explosive properties: Not applicable. Not explosive or pyrotechnic. Not in itself capable of producing gas by chemical reaction at temperature and pressure and at a speed as to cause damage to the surroundings. Not capable of a self-sustaining exothermic chemical reaction.
(t) Oxidising properties: Not applicable as does not cause or contribute to the combustion of other materials.

9.2 Other information
Miscibility, conductivity, dissolution in oil, oxsido reduction potential: not applicable.

10. STABILITY AND REACTIVITY

10.1 Reactivity
When mixed with water, cement will harden into a stable mass that is not reactive in normal environments.

10.2 Chemical stability
Cement is stable as long as it is properly stored (see Section 7). It should be kept dry. Contact with incompatible materials should be avoided.
Wet cement is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble metals. Cement dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas.

10.3 Possibility of hazardous reactions
Not applicable.

10.4 Conditions to avoid
Humid conditions during storage may cause lump formation and loss of product quality.

10.5 Incompatible materials
Acids, ammonium salts, aluminum or other non-noble metals. Uncontrolled use of aluminum powder in wet cement should be avoided as hydrogen is produced.

10.6 Hazardous decomposition products
Cement will not decompose into any hazardous products.

11. TOXICOLOGICAL INFORMATION

Hazard class	Classification	Effect	Reference
Acute toxicity	-	Based on available data, the classification criteria are not met.	

Irritation	H335 H315 H318	Cement dust may irritate the throat and respiratory tract. Coughing, sneezing, and shortness of breath may occur following exposures in excess of occupational exposure limits. Cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause burns. Cement used in the study is Portland cement with over 90% Portland cement clinker. Cement caused a mixed picture of corneal effects and the calculated irritation index was 128. Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact with larger amounts of dry cement dust or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns.	(1) (2) Human experiance (4), (5)
Skin sensitation	H317	Some individuals may develop eczema upon exposure to wet cement dust, caused either by the high pH which induces irritant contact dermatitis after prolonged contact, or by an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis.	(3), (6)
STOT repeated exposure	-	Based on available data, the classification criteria are not met	
Carcinogenicity	-	No causal association has been established between cement exposure and cancer. The epidemiological literature does not support the designation of cement as a suspected human carcinogen.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met	(7), (8)
Reproductive toxicity	-	Based on available data, the classification criteria are not met	

12. ECOLOGICAL INFORMATION

12.1 Toxicity
The product is not hazardous to the environment.

12.2 Persistence and degradability
Not relevant as cement is an inorganic material. After hydration, cement lumps present no toxicity risks.

12.3 Bioaccumulative potential
Not relevant as cement is an inorganic material. After hydration, cement lumps present no toxicity risks.

12.4 Mobility in soil
Not relevant as cement is an inorganic material. After hydration, cement lumps present no toxicity risks.

12.5 Results of PBT and vPvB asessment
Not relevant as cement is an inorganic material. After hydration, cement lumps present no toxicity risks.

12.6 Other adverse effects

Not relevant.

13. DISPOSAL CONSIDERATIONS

Treat the produced waste in the accordance with the applicable laws and regulations in the area of waste management (Waste management Law ("Official Gazette of RS", No 36/2009 and 88/2010)). Cement is treated as a waste material when it is contaminated with other materials, and if, as such, can not still be used.
Do not dispose of into sewage systems or surface waters.
Product - unused residue or dry spillage
Pick up dry unused residue or dry spillage as is. Mark the containers. Possibly reuse depending upon shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to "Product – after addition of water, hardened"
Product – slurries
Allow to harden, avoid entry in sewage and drainage systems or into bodies of water (e.g. streams) and dispose of as explained below under "Product - after addition of water, hardened".
Product - after addition of water, hardened
Dispose of according to the local legislation. Avoid entry into the sewage water system. Dispose of the hardened product as concrete waste. Due to the inertisation, concrete waste is not a dangerous waste.

14. TRANSPORT INFORMATION

Cement is not covered by the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID); no classification is required.

14.1 UN number
Not relevant.

14.2 UN proper shipping name
Not relevant.

14.3 Transport hazard class(es)
Not relevant.

14.4 Packing group
Not relevant.

14.5 Environmental hazard
Not relevant.

14.6 Special precautions for user
Not relevant.

14.7 Transport in bulk
Not relevant.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
In the preparation of this safety data sheet the following regulations and laws have been used:
Rulebook on the content of the Safety Data Sheet („Official Gazette of RS", No 100/2011);
Law on chemicals ("Official Gazette of RS", No 36/2009, 88/2010, 92/2011, 93/2012, 25/2015);
Regulation on classification, packing, marking and promoting of chemicals and certain products in accordance with globally harmonized system for classification and marking UN ("Official Gazette of RS", No 105/2013, 52/2017);
Regulation on restrictions and bans on production, marketing and using of chemicals("Official Gazette of RS", No 90/2013, 25/2015, 2/2016, 44/2017, 36/2018);

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.

Roolbook on the quality of the cement („Official Gazette of RS“, No 34/2013, 44/2014)

SRPS EN 197-1; 2013 Cement- Part 1 Composition, specification and conformity criteria for commom=n cements (In accordance with EN 197-1; 2011)

15.2 Chemical Safety Assesment

Based on available information and if used according to manual, cement is not danger for occupational health and safety.

16. OTHER INFORMATION

16.1 Indication of changes

In the header is corrected text which refers to the number and the date of version.

Subsection 1.1 **Product identifier** has been added:
Portland composite cement: PC 35M(V-L) 42,5 N/ CEM II/B-M(V-L) 42,5 N

Subsection 1.1 **Product identifier** has been removed:
Composite cement: MP 30(S-V) 32,5R/ CEM V/A (S-V) 32.5R

Subsection 3.2 **Information on mixture ingredients** has been changed**:**

Substance	Conc. Range, %	CAS number	EC number	According to CLP/GHS
Portland cement clinker	65-100	65997-15-1	266-043-4	Serious eye damage 1, H318; Skin irritation 2, H315; Skin sens. 1, H317; TCOJ 3, H335

16.2 Abbrevations and acronyms

ADR/RID European Agreements on the transport of Dangerous goods by Road/Railway
CAS Chemical Abstracts Service
CLP Classification, labelling and packaging (Regulation (EC) No 1272/2008)
EINECS European INventory of Existing Commercial chemical Substances
IATA International Air Transport Association
IMDG International agreement on the Maritime transport of Dangerous Goods
PBT Persistent, bio-accumulative and toxic
vPvB Very persistent, very bio-accumulative
w/w Weight by weight

16.3 Key literature references and source of data

(1) *Portland Cement Dust - Hazard assessment document EH75/7,* UK Health and Safety Executive, 2006. Available from: http://www.hse.gov.uk/pubns/web/portlandcement.pdf.
(2) *Observations on the effects of skin irritation caused by cement*, Kietzman et al, Dermatosen, 47, 5, 184-189 (1999).
(3) *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.
(4) TNO report V8815/09, *Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test*, April 2010.
(5) TNO report V8815/10, *Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test*, April 2010.

(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).
http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf.
(7) *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
(8) *Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro*; Gminski et al, Abstract DGPT conference Mainz, 2008.

16.4 Training advice

In addition to health, safety and environmental training programs for their workers, companies must ensure that workers read, understand and apply the requirements of this SDS.

16.5 Disclaimer

The information on this data sheet reflects the currently available knowledge and the currently state of the art and technology and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product, including the use of the product in combination with any other product or any other process, is the sole responsibility of the user or distributor.
It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.