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Safety data sheet

Moravacem d.o.o.

Date of first version:1.7.2017
Version: 3
Date of creation:05.04.2021.
Revision:/
Date of revision:/

1. A Chemical identification and data on entity putting it in use

1.1 Chemical identification:

In accordance with the regulations of the Republic of Serbia,

Portland cement PC 52,5R

Portland cement PC 42,5R ***(The content of soluble chromium (VI) in cement after hydration is below 0,0002% calculated on the mass of dry cement.)**

Portland cement with limestone PC 20L 42,5R

Portland composite cement PC 35M (V-L) 42,5N

Metalurgical cement M 20K 32,5N – LH/SR

Binder for road stabilization HRB E2

Hydraulic road binder HRB E4

In accordance with the regulations of European Union,

Portland cement CEM I 52,5R

Portland cement CEM I 42,5R ***(The content of soluble chromium (VI) in cement after hydration is below 0,0002% calculated on the mass of dry cement.)**

Portland cement with limestone CEM II/A-L 42,5R

Portland composite cement CEM II/B-M (V-L) 42,5N

Metalurgical cement CEM III/B 32,5N – LH/SR

Binder for road stabilization HRB E2

Hydraulic road binder HRB E4

*** Valid exclusively for this type of cement.**

1.2 Identified uses of the chemical and methods of use that are not recommended:

Cement is used as a hydraulic binder in construction for the production of concrete, mortar, filler, grouting compound, concrete castings.

1.3 Data on a legal entity putting the chemical into use:

a) Name: Moravacem d.o.o.

b) Producer: Moravacem d.o.o.

c) Address and phone number: Branka Ristića 8, 35 254 Popovac; + 381 35 572 200; +381 63 657 615

d) E-mail: nenad.kokalj@moravacem.rs

1.4 Emergency phone number:

National poison control center Phone: +381 11 3608 440; working hours 24h

2. Hazard identification

2.1 Chemical classification:

Chemical classification was made in conformity with the Rulebook on classification, packing, marking and advertisement of the chemical and the particular product in line with globally harmonized System for classification and marking of the UN ("Official Gazette of RS", no *105/2013 and 52/2017)*

Irritable to skin, category 2, H315
May cause sensitivity when in contact with the skin, category 1, H317
Risk to a serious damage on the eye, category 1, H318
Specific target organ toxicity – single exposure, category 3, H335

2.2 Label elements:

Chemical labeling was made in conformity with the Rulebook on classification, packing, marking and advertisement of the chemical and the particular product in line with globally harmonized System for classification and marking of the UN ("Official Gazette of RS", no *105/2013 and 52/2017)*

DANGER

Hazard notifications:
H318 Risk to a serious damage on the eye
H315 Irritable to skin
H317 May cause allergic skin reaction.
H335 Irritable to respiratory organs

Precautionary notifications:
P102 Keep out of the reach of children.
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 and continue rinsing.
P310 Immediately call National poison control center or doctor/physician
P302+P352 IF ON SKIN: Wash with plenty of soap and water
P333+P313 If skin irritation or rash occurs: Get medical advice/attention
P261 Avoid inhaling dust
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P312 Call National poison control center or doctor/physician if you feel unwell
P501 Dispose contents / container in accordance with national regulations (Law on packaging and packaging waste („Official Gazette of RS“ No. 36/2009), Law on waste management („Official Gazette of RS“ No. 36/2009, 88/2010 and 14/2016))

2.3 Other hazards:

Cement does not meet the criteria for identification as PBT or vPvT chemicals.

The product delivered in bulk may contain soluble Cr^{6+} which, in contact with the skin, may cause an allergic reaction.

*** CEM I 42,5 R (PC 42,5 R) -** The content of soluble chromium (VI) in cement after hydration is below 0,0002% calculated on the mass of dry cement. The cement that is found on the market after the expiry of the deadline, or after the cessation of the action of the reducing agent, may contain a water-soluble Cr6 +, which as such may cause an allergic reaction.

* Valid exclusively for this type of cement.

3. Composition/Data on ingredients

3.1 Data on substance ingredients:

Not relevant.

3.2 Data on mixture ingredients:

Name	EC number	CAS number	Concentration %	Classification according to CLP/GHS
Portland cement clinker *	266-043-4	65997-15-1	15-95%	Irritation of skin 2; H315 Serious eye damage 1; H318 Irritation of skin 1; H317 Irritation of respiratory organs 3; H335

4. First aid measures

4.1 Description of the first aid measures:

Eye contact: Do not rub your eyes as it may cause mechanical damage to the cornea. Remove contact lenses if you use them. Immediately, with no delay, rinse the eyes with water. The eyes should be rinsed with plenty of water for at least 15 minutes in order to remove all particles. Ask for medical help with no delay.

Skin contact: Thoroughly clean the skin with pH-neutral soap and cold water. Should any irritation, pain or other skin changes occur, immediately ask for medical help.

Dust inhaling: In case of inhaling of cement dust, take the person out for a fresh air. In case of inflammation or irritation of respiratory organs, nausea, cough or other symptoms, ask for medical help.

In case of swallowing: Do not stimulate throwing out. If the injured person is conscious, mouth should be rinsed and plenty of water should be drunk. In case of swallowing of a larger amount of the product, ask for medical help.

4.2 The most important symptoms and effects, both acute and delayed:

Eyes: In case that cement or hydraulic binder (dry or wet) comes into contact with an eye, it may cause serious and potentially irreversible injuries.
Skin: In the case of a long exposure, cement or hydraulic binder may have an irritating effect in contact with a wet skin (from perspiration or humid air). If the skin is exposed for a longer time to a wet cement or fresh mortar, severe burns may occur without feeling of pain (alkaline burns). Frequent exposure to wet cement can cause dermatitis.
Ingestion: Do not swallow cement or hydraulic binder. Ingestion of a small amount of cement or hydraulic binder does not have to be harmful; the ingestion of large amounts can cause burns in the mouth, throat and other digestive organs.
Inhalation: Frequent inhalation of greater amounts of cement or hydraulic binder dust over a long period of time increases the likelihood of developing lung diseases.
Environment: Cement clinker is not hazardous to the environment, with proper use.

4.3 Emergency assistance:

When contacting a physician, take this safety sheet with you.

5. Fire preventive measures

5.1 Fire extinguishers:

The product is not flammable.

5.2 Special hazards arising from the substance or mixture:

The product is not flammable or explosive.

5.3 Advice for firefighters:

If a fire occurs near the product, take appropriate measures and use extinguishing agents that are appropriate for the environment in which the fire originated.

6. Measures in case of an accident

6.1 Personal precautions, protective equipment and emergency procedures:

6.1.1 For individuals who are not trained in case of an accident

Wear protective equipment as described in Section 8 and follow the instructions for safe handling given in chapter 7.

6.1.2 For persons involved in the response to the accident

Procedures in case of an accident are not required.

Respiratory protection is required in case that cement dust is scattered into the air.

6.2 Precautions relating to the environment:

Do not flush product into sewers, drainage systems and watercourses.

6.3 Methods and materials for containment and cleaning up:

If there is dissipation of product, it is necessary to pick up spilled material and place it in an appropriate container. When collecting spilled material, avoid actions that cause the dispersion of cement dust into the air. Avoid inhalation of dust and contact with skin. Wear appropriate protective equipment. In case of binding of spilled material with water, scrape the material and place it in an appropriate container.

The product may further be used if it is not contaminated with other materials.

6.4 Reference to other sections:

See chapters 8 and 13 for more details

7. Handling and storage

7.1 Precautions for safe handling:

Safe handling of the chemical

Follow the measures given in Chapter 8.2.

Measures to prevent the spread

For dry cement cleaning, refer to Subsection 6.3.

Measures to prevent fire

Not applicable.

Measures for preventing the formation of aerosols and dust

Use dry cleanup methods such as vacuum cleaning or vacuum extraction, which do not cause dispersion of dust. Do not clean with a broom.

Measures for environmental protection

No special measures.

Instructions on general hygiene in the workplace

Do not handle or store cement clinker near food and beverages. After using the material, wash your hands. Wear protective equipment, such as dust mask, respirators and protective glasses if necessary. Use protective gloves to avoid contact with skin.

7.2 Conditions for safe storage, including any incompatibilities:

Bulk cement is to be stored and kept in dry (with minimum internal condensation), waterproof, clean silos protected from contamination. Dangers of suffocation: cement can be accumulated and stuck on inside walls. It can unexpectedly be released and fall down. Due to the risk of suffocation or choking, do not enter enclosed spaces such as silos, tanks, trucks for the transport of bulk materials, or other storage containers. Do not use aluminum containers due to the material incompatibility.

7.3 Specific use:

There is no additional information for specific use cases.

8. Exposure control

8.1 Specific parameters for exposure control:

For dust the following maximum allowed concentrations (MAC) have been defined for exposure (exposition) in accordance with SRPS Z.B0.001 standard of 1991:

MDK: 5 mg/m^3 - for respiratory dust

15 mg/m^3 - for total dust

8.2 Exposure control and personal protection:

Technical control data

Use appropriate measures to reduce dust generation and prevent dust emission in the environment, such as de-dusting, venting systems and dry cleaning methods that do not cause dust dispersion in the air.

Personal protection measures data

General measures: Eating, drinking and smoking should be avoided while working with cement, to prevent contact with skin or mouth. Upon completion of works, contaminated clothing and shoes should be taken off, and carefully cleaned before the next use.

Eye / face protection

Use protective goggles with side protection, which will prevent dust from contact with the eyes. It is not recommended to use contact lenses when working with cement.

Skin protection

Use suitable and water-resistant protective gloves, protective shoes and clothing, to prevent contact of cement with skin. Clothing and protective equipment saturated with wet cement dust should be immediately removed; the exposed skin surface should be immediately washed.

Protection of the respiratory organs

Use appropriate respiratory protection if the person is potentially exposed to dust concentration above the maximum permissible concentration.

Protection against thermal hazards

Not applicable

9. Physical and chemical properties

9.1 Data on basic physical and chemical properties of the chemical:

a) **Appearance:** Cement is gray or white, powder inorganic solid material

b) **Odor**: No odor

c) **Odor threshold**: No smell threshold

d) **pH**: (T = 20°C): 11-13.5

e) **Melting point / freezing point**: Not relevant

f) **Boiling point and boiling range**: Not relevant

g) **Ignition point**: Not relevant

h) **Evaporation rate**: Not relevant because it is not liquid

i) **Flammability (solid, gaseous)**: Not relevant because it is a solid material that is non-flammable and does not cause or contributes to inflammability by friction

j) **Upper/lower limit of inflammability or explosiveness**: Not relevant because it is not flammable gas

k) **Vapor pressure**: Not relevant

l) **Vapor density**: Not relevant

m) **Relative density**: 2.75-3.20

n) **Water solubility (T = 20°C)**: Not relevant

o) **Partition coefficient in the n-octanol / water system**: Not relevant because it is inorganic substance

p) **Auto-ignition temperature**: Not relevant (not self-igniting – no organic-metallic, organic-metalloid or organic phosphine binders or their derivatives, and no other self-inflammable compounds in the composition)

q) **Decomposition temperature**: Not relevant because there is no organic peroxide present

r) **Viscosity**: Not relevant because it is not liquid

s) **Explosive properties**: Not relevant. It's not explosive. It is not self-capable to produce gas in a chemical reaction at temperature and pressure and at a rate that causes environmental damage. It is not capable of self-sustaining exothermic chemical reaction.

t) **Oxidizing properties**: Not relevant because it does not cause or contribute to the combustion of other materials.

9.2. Other data

Mixability, conductivity, dissolution in oil, oxidation potential: Not relevant

10. Stability and reactivity

10.1 Reactivity:

When mixed with water, cement builds a stable mass that is not reactive, under normal conditions.

10.2 Chemical stability:

Cement is a stable material, in proper storage conditions (see section 7) and compatible with majority of other building materials.

Wet cement has alkali properties, and as such, is not compatible with the acids, ammonium salts, aluminum and other non-precious metals. Cement is dissolved in hydrofluoric acid, releasing the corrosive gas silicon tetrafluoride

10.3 Possibility of hazardous reactions:

Cement is not a subject to reactions which lead to the formation of dangerous products, nor is it a subject of polymerization reactions.

10.4 Conditions to avoid:

Humid conditions during storage may lead to creation of lumps and loss of product quality.

10.5 Incompatible materials:

Cement clinker in contact with water have alkali properties, and as such, is not compatible with the acids, ammonium salts and aluminum.

10.6 Hazardous decomposition products:

Cement is not decomposed into hazardous by-products.

11. Toxicological data

11.1 Information on toxicological effects:

a) acute toxicity:

Based on available data, the classification criteria are not met

b) skin corrosion / irritation:

In contact with wet skin, cement clinker can cause skin damage. Prolonged contact can cause severe burns.

H335-Cement dust can cause irritation of the throat and respiratory organs. Coughing, sneezing and short-shallow respiration can occur in case of exposure to dust above the MDC in the workplace.

H315-Cement in contact with moist skin can cause drying and cracking of the skin. In case of prolonged exposure and in combination with its abrasive effect, burns may occur. The cement used in the tests is Portland cement with more than 90% Portland cement clinker.

H318-Cement has shown a mix of the effect on the cornea and the calculated irritation index is 128. Direct contact of the cement with the cornea can cause mechanical damage to the cornea, immediate or delayed irritation or eye inflammation. Direct contact with larger amounts of dry cement dust or spraying wet cement can cause effects ranging from moderate eye irritation (e.g. conjunctivitis) to chemical burns.

c) serious eye damage / eye irritation:

In direct contact, cement clinker dust may lead to the eye damage due to mechanical stress, immediate or delayed irritation or inflammation.
Direct contact with large amounts of dry cement clinker dust or splashes of wet cement clinker dust may cause effects ranging from moderate eye irritation (e.g. conjunctivitis) to chemical burns and blindness.

d) sensitization of the respiratory tract or skin:

There is no indication of respiratory sensitization. Based on available data, the classification criteria are not met.

Exposure to wet cement clinker dust can cause skin rash and prolonged contact with the emergence of dermatitis, i.e. eczema.

H317-Following the exposure to moist cement, individuals may develop eczema, induced either by high pH that causes irritant contact dermatitis after prolonged exposure or by an immunological reaction to a soluble Cr^{6+} that causes allergic contact dermatitis.

e) germative cell mutagenicity:

Based on available data, the classification criteria are not met

f) carcinogenicity:
Based on available data, the classification criteria are not met

g) reproductive toxicity:
Based on available data, the classification criteria are not met

h) specific target organ toxicity – single exposure:
Cement dust can cause irritation of the throat and airways. Coughing, sneezing and breathing difficulties can be caused by exceeding the maximum allowable exposure concentration. However, so far there is not enough evidence to define the relationships dose-response for these effects.

i) specific target organ toxicity – repeated exposure:
No chronic effects.
Based on available data, the classification criteria are not met

j) aspiration hazard:
Not applicable because the cement clinker is used as aerosol

k) symptoms related to physical, chemical and toxicological properties:
Causes immediate or delayed irritation of the mucous membrane of the eye.

l) Delayed and immediate effects and chronic effects due to short-term and prolonged exposure:
Not applicable.

lj) Interaction effects:
Not applicable.

m) Absence of certain data:
Not applicable.

n) Data on the mixture in relation to the data on the substances in it:
Not applicable.

nj) Other data:
Not applicable.

12. Eco-toxicological data

12.1 Toxicity:
The product is not dangerous for the environment and is not toxic to animals.
If large quantities of cement clinker gets into the water, it can increase the pH and with it the appearance of toxicity to aquatic life under certain conditions.

12.2 Persistence and degradability:
Not relevant, cement is an inorganic material and after hardening there is no risk of toxicity.

12.3 Bio accumulative potential:
Not relevant, cement is an inorganic material and after hardening there is no risk of toxicity.

12.4 Mobility in soil:
Not relevant, cement is an inorganic material and after hardening there is no risk of toxicity.

12.5 Results of PBT and vPvB assessment:
Not relevant, cement is an inorganic material and after hardening there is no risk of toxicity.

12.6 Other harmful effects:
Not relevant.

13. Disposal

13.1 Waste treatment methods:
Cement is treated as a waste material in case it is contaminated with other materials, and as such it cannot be used further.

The waste material is to be treated in accordance with the valid legal regulations in the area of waste management and provisions of the Waste Management Act ("Official Gazette of RS", no. 36/2009, 88/2010 and 14/2016).

Do not dispose of in sewage systems or surface water.

Product - unused residue or spilled dry quantity

Collect the entire dry unused residue or spilled dry cement. It is necessary to mark the containers in which the dry unused residue or spilled dry cement is located. Reuse of the product depends on the expiry date and requirements to avoid the excessive dust. In case of disposal, solidify with water and dispose of according to "Product - after mixing with water, hardened".

Product - damp mixtures

Allow the product to harden, and prevent entry into sewage and drainage systems or into water courses, and dispose of as explained in "Product - after mixing with water, hardened".

Product - after mixing with water, hardened

Dispose of in accordance with local regulations. Prevent entry into the sewer system. Dispose of hardened product as concrete waste. Due to inertia, concrete waste is not hazardous waste.

14. Transportation data

Cement clinker is not included in the international regulations on hazardous material transportations (IMDG, IATA, ADR/RID); Classification is not required.

14.1 UN number:
Not relevant

14.2 UN name for cargo transport:
Not relevant

14.3 Transport hazard class:
Not relevant

14.4 Packing group:
Not relevant

14.5 Environmental hazards:
Not relevant

14.6 Special precautions for user:
Not relevant

14.7 Transport in bulk:
Not relevant

15. Regulatory data

15.1 Regulations relating to safety, health and the environment:

During the development of this safety data sheet, the following documents were used: Rulebook on the contents of the safety data sheet ("Official Gazette of RS", No. 100/11); Law on Chemicals ("Official Gazette of RS", No. 36/09, 88/10, 92/11, 93/12, 25/15); The Rulebook on Classification, Packaging, Marking and Advertising of Chemicals and Certain Products in accordance with the Globally Harmonized System for Classification and Marking of the UN ("Official Gazette of the Republic of Serbia" No. 105/2013 and 52/2017); Regulation on Restrictions and Prohibitions of Production, the marketing and use of chemicals that represent an unacceptable risk to human health and the environment ("Official Gazette of the Republic of Serbia" No. 90/13, 25/15); Law on Waste Management ("Official Gazette of the Republic of Serbia", No. 36/2009, 88/2010 and 14/2016); Law on Packaging and Packaging Waste ("Official Gazette of RS", No. 36/2009).

15.2. Chemical Safety Assessment

Cement does not pose a risk to health and safety, based on available data and if used in accordance with the instructions.

16. Other data

16.1. Changes

Chapter **1.3 Data on a legal entity** was changed to account for the name change of CRH (Srbija) d.o.o. to Moravacem d.o.o.

16.2. Abbreviations and acronyms

CAS Chemical Abstracts Service
CLP Classification, Labeling and Packaging (Regulation (EC) No 1272/2008)
IATA International Air Transport Association
IMDG International Maritime Dangerous Goods Code
MDK Maximum allowed concentration
PBT Persistent, bio accumulative and toxic
vPvB Highly persistent, highly bio accumulative w/w weight on weight

16.3. References and data sources

(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) *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.

(4) *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.

(5) *U.S. EPA, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, 3rd ed. EPA/600/7-91/002, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1994a) and 4th ed. EPA-821-R-02-013, US EPA, office of water, Washington D.C. (2002).

(6) *U.S. EPA, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th ed. EPA/600/4-90/027F, Environmental Monitoring and Support Laboratory, U.S. EPA, Cincinnati, OH (1993) and 5th ed. EPA-821-R-02-012, US EPA, office of water, Washington D.C. (2002).

(7) *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.

(8) *Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker* prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.

(9) TNO report V8801/02, *An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats*, August 2010.

16.4 A list of relevant labels

Label elements are provided in sub-section **2.2. Information on precautionary measures**. The following text explains that some precautions are related to prevention, response and disposal:

Precautionary Notices - Prevention:

Sign of danger and written warning:

DANGER

Composition:
Portland cement clinker 15-95%

Danger:

H318 Risk to a serious damage on the eye
H315 Irritable to skin
H317 May cause allergic skin reaction.
H335 Irritable to respiratory organs

P102 Keep out of the reach of children.
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 and continue rinsing.
P310 Immediately call National poison control center or doctor/physician
P302+P352 IF ON SKIN: Wash with plenty of soap and water
P333+P313 If skin irritation or rash occurs: Get medical advice/attention
P261 Avoid inhaling dust
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P312 Call National poison control center or doctor/physician if you feel unwell
P501 Dispose contents / container in accordance with national regulations (Law on packaging and packaging waste („Official Gazette of RS" No. 36/2009), Law on waste management („Official Gazette of RS" No. 36/2009, 88/2010 and 14/2016))

16.5. Training advice

Companies should ensure that employees read, understand, and apply the requirements of this Safety Data Sheet and should train their employees in the field of safety, health and the environment.

16.6 Other

The information in this Safety Data Sheet is in accordance with the manufacturer's knowledge and available information and is reliable if the product is used under the prescribed conditions and in accordance with the application. Any other use of this product, including the use of this product in combination with other products or processes, is the sole responsibility of the user or distributor. The user is responsible for determining the appropriate security measures and for the application of legal regulations that relate to his activities.

-END OF SAFETY DATA SHEET-