

SAFETY DATA SHEET

According to Regulation on Preparation of Safety Data Sheets for Hazardous Substances and Mixtures
(13.12.2014-29204 Turkish Official Gazette)

PORTLAND CEMENT CLINKER

Date of Issue : 02.01.2020
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1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1. Identification of the Product

Product Name: Portland Cement Clinker

EINECS: 266-043-4

CAS: 65997-15-1

1.2. Use of the Substance / Application Area

Portland cement clinker is used for the production of Common cements or other hydraulic binders in industrial installations. Cement and hydraulic binders are used in the production of building materials and in construction by professional users or consumers.

1.3. Identification of the Company

Manufacturer's

Name: Limak Çimento San. Ve Tic. A.Ş. Kilis Şubesi

Address: Dümbüllü Köyü Sumaklıdere Mevkii Polateli / Kilis

Telephone Number: 0348 728 50 01/04

Fax: -

E-mail: kc@limakcement.com

Web: www.limakcimento.com

1.4. Emergency Telephone Number

Company Information: 0348 728 50 01/04

Working Hours: 08:00-18:00 (Weekdays)

Call the emergency telephone number of your town and provide the information contained in this sheet. If not available, call the National Toxicology Centre.

2. HAZARDS IDENTIFICATION

2.1. Classification⁽¹⁾

The product has been classified according to Regulation 11.12.2013-28848 CLP and Regulation (EC) No 1272/2008 of the European Parliament and of the Council.

Physico-chemical Hazard: Not relevant.

Health Hazard:

According to Regulation 11.12.2013-28848 CLP;

Skin Irritation 2; H315: Causes skin irritation.

Skin Sensitisation 1B; H317: May cause an allergic skin reaction.

Serious Eye Damage/Eye Irritation 1; H318: Causes serious eye damage.

STOT Single Exposure Respiratory Tract Irritation 3; H335: May cause respiratory irritation.

Environmental Hazard: Not relevant.

2.2. Label Elements

Hazard Pictograms:



Signal Word: Danger

Hazard Statements:

H318 Causes serious eye damage.

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

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H335 May cause respiratory irritation.

Precautionary Statements:

Measure

- P102 Keep out of reach of children.
P264 Wash hands, forearms, exposed areas thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing must not be allowed out of the workplace.
P271 Use only outdoors or in a well-ventilated area.

Response

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

P310 Immediately call a POISON CENTER or doctor/physician.

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

P321 Specific treatment (see on this label).

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

P362 Take off contaminated clothing and wash it before reuse.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P363 Wash contaminated clothing before reuse.

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P405: Store locked up.

Disposal

P501: Dispose of waste material in accordance with all local, regional, state, national, provincial, territorial and international regulations.

Additional Information

Portland cement clinker dust may cause an allergic reaction in some individuals due to the water soluble Cr(VI) content.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Portland cement clinker is a substance of unknown or variable composition consisting of 4 main clinker phases, namely tri- and dicalcium-silicates ($3\text{CaO} \cdot \text{SiO}_2$ and $2\text{CaO} \cdot \text{SiO}_2$), tricalcium-aluminate ($3\text{CaO} \cdot \text{Al}_2\text{O}_3$) and tetracalcium-aluminoferrite ($4\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{Fe}_2\text{O}_3$), usually together with some unreacted CaO (free lime) compounds. It is made by mineralogical transformation of raw materials that usage ratios is exactly known and formed by raw materials including oxides of calcium, silicon, aluminium and iron and small quantities of other elements.

IUPAC Name	EC Number	CAS Number	Molecule Formula	Typical Concentration % (weight)	Concentration Range % (weight)
Tricalcium silicate	235-336-9	12168-85-3	$3\text{CaO} \cdot \text{SiO}_2$	63	0-85
Dicalcium silicate	233-107-8	10034-77-2	$2\text{CaO} \cdot \text{SiO}_2$	15	0-85

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Tetracalcium aluminoferrite	235-094-4	12068-35-8	$4\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot \text{Fe}_2\text{O}_3$	10	0-30
Tricalcium aluminate	234-932-6	12042-78-3	$3\text{CaO} \cdot \text{Al}_2\text{O}_3$	10	0-20
Calcium oxide (free lime)	215-138-9	1305-78-8	CaO	1	0-10
Magnesium oxide	215-171-9	1309-48-4	MgO	0,5	0-5

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 Portland cement clinker or wet Portland cement clinker containing mixtures.

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 Portland cement clinker, remove and rinse abundantly with water. For wet/damp Portland cement clinker, 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 poison information centre.

4.2. Most Important Symptoms and Effects, Both Acute and Delayed

Eyes: Eye contact with Portland cement clinker dust (dry or wet) may cause serious and potentially irreversible injuries.

Skin: Portland cement clinker 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 clinker dust and moist skin may cause irritation, dermatitis or burns.⁽²⁾

Inhalation: Repeated inhalation of Portland cement clinker dust over a long period of time increases the risk of developing lung diseases.

Environment: Under normal use, Portland cement clinker is not hazardous to the environment.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

When contacting a physician, take this SDS with you.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Portland cement clinker is not flammable.

5.2. Special Hazards Arising from the Product



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

5.3. Advice for Fire-Fighters

Portland cement clinker poses no fire-related hazards. No need for special protective equipment for fire-fighters. In case of fire, common fire protective equipment should be used.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

6.1.1. Personal Protective Precautions 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. Personal Protective Precautions for Emergency Responders

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

6.2. Environmental Precautions

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

6.3. Methods and Material for Containment and Cleaning Up

Collect spilled material and use it.

For dry Portland cement clinker;

Use dry cleanup methods such as vacuum clean-up or vacuum extraction (Industrial portable units equipped with high efficiency air filters (EPA and HEPA filters, EN 1822-1:2009) which do not cause airborne dispersion. Never use compressed air.

Ensure that the workers wear appropriate personal protective equipment and prevent dust from spreading.

Avoid inhalation of Portland cement clinker dust and contact with skin. Place spilled material in a container for future use.

6.4. Reference to Other Sections

See sections 8 and 13 for more details.

7. HANDLING AND STORAGE

7.1 Precautions for Safe Handling

7.1.1. Protective Measures

Follow the recommendations as given under Section 8.

To clean up dry Portland cement clinker, 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.

7.1.2. Information on General Occupational Hygiene

Do not handle or store near food and beverages or smoking materials. In dusty environment, wear dust mask and protective goggles.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Portland cement clinker should be stored under waterproof, dry conditions, clean and protected from contamination.

Engulfment Hazard: Portland cement clinker can build-up or adhere to the walls of a confined space. The



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clinker can release, collapse or fall unexpectedly. To prevent engulfment or suffocation, do not enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains Portland cement clinker without taking the proper safety measures.

Do not use aluminium containers for the storage or transport of wet cement containing mixtures due to incompatibility of the materials.

7.3. Specific End Use(s)

Clinker is used for the production of common cements or other hydraulic binders.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1. Control Paramaters

8.1.1. Exposure Limits

According to national Dust Control Regulation;
Occupational exposure limits for dust

Name of Substance	CAS No	Total Dust Amount TWA/ZAOD (mg/m ³)	Respirable Dust Amount TWA/ZAOD (mg/m ³)
Portland cement clinker	65997-15-1	15	5

Exposure threshold limit values for rocks and minerals having speciality

Mineral	Limit Value (mg/m ³)
Portland cement clinker	80 mg/m ³ % SiO ₂ +2

8.1.2. Exposure Limits in Handling Chemical Materials

According to Regulation on Health and Safety Measures in Handling Chemical Materials, there is no exposure limit and exposure threshold limit value for water soluble Cr VI component included by cement clinker.

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 Personal Protective Precautions

Equipment and suitable protection methods that will be used in situations where personal protection needed are defined according to Personal Protective Equipment Regulation No.28695 dated 2.7.2013.

General Precautions

Do not eat, drink or smoke when working with clinker to avoid contact with skin or mouth.

Before starting to work with clinker, apply a barrier creme and reapply it at regular intervals.

Immediately after working with clinker or clinker-containing materials, workers should wash or shower or use skin moisturisers. Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them.

Eye /Face Protection

Wear approved glasses or safety goggles according to EN 166 when handling dry or wet clinker to prevent contact with eyes.

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Skin Protection: Use watertight, wear- and alkali-resistant protective gloves (eg nitrile soaked cotton gloves with CE mark). Use boots, closed long-sleeved protective clothing as well as skin care products to protect the skin from prolonged contact with wet clinker. For the gloves, respect the maximum wearing time to avoid skin problems.



Respiratory Protection: When a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection. The type of respiratory protection should be adapted to the dust level and conform to EN 149 standard.



Thermal Hazards: Not applicable.

8.2.3 Environmental Exposure Controls

Air: Environmental exposure control for the emission of clinker particles into air has to be in accordance with the available technology and regulations for the emission of general dust particles.

Water: Do not wash clinker into sewage systems or into bodies of water, to avoid high pH. Above pH 9 negative ecotoxicological impacts are possible.

Soil: No special emission control measures are necessary for the exposure to the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Portland cement clinker is a grey or white, granular inorganic solid material

Odour: Odourless.

Odour Threshold: no odour threshold, odourless.

pH: (T = 20°C in water, water-solid ratio 1:2): 11-13.5

Melting Point: > 1250 °C

Initial Boiling Point and Boiling Range: Not applicable as under normal atmospheric conditions, melting point > 1250°C

Flash Point: Not applicable as is not a liquid.

Evaporation Rate: Not applicable as is not a liquid.

Flammability (Solid, Gas): Not applicable as is a solid which is non combustible and does not cause or contribute to fire through friction.

Upper/Lower Flammability or Explosive Limits: Not applicable as is not a flammable gas

Vapour Pressure: Not applicable as melting point > 1250 °C

Vapour Density: Not applicable as melting point > 1250 °C

Relative Density: 2.75-3.20; Apparent density -: 0.9-1.5 g/cm³

Solubility(ies) in Water (T = 20 °C): Slight (0.1-1.5 g/l)

Partition Coefficient: n-octanol/water: Not applicable as is inorganic substance.

Auto-Ignition Temperature: Not applicable.

Decomposition Temperature: Not applicable as no organic peroxide present.

Viscosity: Not applicable as not a liquid.

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.

Oxidising Properties: Not applicable.



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10. STABILITY AND REACTIVITY

10.1. Reactivity

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

10.2. Chemical Stability

Clinker 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 clinker is alkaline and incompatible with acids, with ammonium salts, with aluminium or other non-noble metals. Clinker dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas. Clinker reacts with water to form silicates and calcium hydroxide. Silicates in clinker react with powerful oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride.

10.3. Possibility of hazardous reactions

Clinkers do not cause hazardous reactions.

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, aluminium or other non-noble metals. Uncontrolled use of aluminium powder in wet clinker should be avoided as hydrogen is produced.

10.6. Hazardous decomposition products

Clinker will not decompose into any hazardous products.

11. TOXICOLOGICAL INFORMATION

Portland cement clinker in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns. ⁽³⁾

Direct contact with Portland cement clinker may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact with larger amounts of dry Portland cement clinker dust or splashes of wet clinker may cause effects ranging from moderate eye irritation to chemical burns and blindness. ^(4,5)

Exposure to wet clinker dust may develop eczema because of the irritation caused by high pH value after prolonged exposure or allergic effect of soluble Cr (VI) salts. ^(6,7,8)

Portland Cement clinker dust may irritate the throat and respiratory tract. Coughing and shortness of breath may occur following exposures in excess of occupational exposure limits. ⁽²⁾

Portland cement clinker dust may aggravate existing respiratory system disease(s) such as emphysema or asthma and/or existing skin and eye conditions.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Portland cement clinker is not hazardous for ecosystem. The addition of large amounts of Portland cement clinker to water may, however, cause a rise in pH and may, therefore, be toxic to aquatic life under certain circumstances.

12.2. Persistence and Degradability

Not relevant as Portland cement clinker is an inorganic material. As a result of hydration of Portland cement clinker, toxicity is not emerge.

12.3. Bioaccumulative Potential

Not relevant as Portland cement clinker is an inorganic material. As a result of hydration of Portland cement clinker, toxicity is not emerge.

12.4. Mobility in Soil



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Not relevant as Portland cement clinker is an inorganic material. As a result of hydration of Portland cement clinker, toxicity is not emerge.

12.5. Results of PBT and vPvB Assessment

Not relevant as Portland cement clinker is an inorganic material. As a result of hydration of Portland cement clinker, toxicity is not emerge.

12.6. Other Adverse Effects

Not relevant.

13. DISPOSAL CONSIDERATIONS

Cement clinker may always be reused. Therefore waste treatment methods do not apply. Cement clinker should not be disposed to sewage or drainage systems, surface or ground water. Used packages should be disposed according to Regulation on Control of Packaging Waste.

14. TRANSPORT INFORMATION

Portland cement clinker is not classified as dangerous by Regulation on Carriage of Dangerous Goods by Road, Regulation on Carriage of Dangerous Goods by Seaway and the international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

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 Hazards: Not relevant.

14.6. Special Precautions for User: Not relevant.

14.7. Transport in Bulk According to Annex II of MARPOL73/78 and the IBC Code: Not relevant.

15. REGULATORY INFORMATION

15.1. Safety, Health and Environmental Regulations/Legislation Specific for the Substance

National regulations used in the preparation of material safety data sheet and that can be related are given below.

Regulation on Classification, Packaging and Labelling of Dangerous Substances

Regulation Classification, Labelling and Packaging of Substances and Mixtures

Regulation on Carriage of Dangerous Goods by Road

Regulation on Carriage of Dangerous Goods by Seaway

Regulation on Control of Packaging Waste

Dust Control Regulation

Regulation on Health and Safety Measures in Handling Chemical Materials

Personal Protective Equipment Regulation

16. OTHER INFORMATION

Hazard Statements

Skin Irritation 2; H315: Causes skin irritation.

Skin Sensitisation 1B; H317: May cause an allergic skin reaction.

Serious Eye Damage/Eye Irritation 1; H318: Causes serious eye damage.

STOT Single Exposure Respiratory Tract Irritation 3; H335: May cause respiratory irritation.

Abbreviations

1272/2008/EC: Regulation of the European Parliament and of the Council on Classification, Labelling and Packaging of Substances and Mixtures



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ADR/RID: European Agreement Concerning the International Carriage of Dangerous Goods by Road/Railway **CAS:** Chemical Abstracts Service

CLP: Regulation on Classification, Labelling and Packaging of Substances and Mixtures.

EC: European Commission

EINECS: European Inventory of Existing Commercial Chemical Substances

IATA: International Air Transport Association

IBC Code: International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk

IMDG: International Maritime Code for Dangerous Goods

IUPAC: The International Union of Pure and Applied Chemistry

MARPOL 73/78: International Convention for the Prevention of Pollution from Ships

mg / m³ : at 20°C temperature and under 101,3 kPa (760 mm Hg) pressure miligram equivalent amount of substance in 1 m³ of air.

PBT: Persistent, Bio-accumulative and Toxic

STOT: Specific Target Organ Toxicity

TWA/ZAOD: Time-weighted average

vPvB: Very Persistent, Very Bio-accumulative

Key Literature References and Sources of Data

(1) ECHA European Chemicals Agency C&L Inventory Database, Available from: <http://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/cl-inventory/view-notification-summary/6670>

(2) *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>.

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

(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) *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.

(7) *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.

(8) *Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations*, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

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 Safety Data Sheet.

Revision

Prepared for the first time. This Safety Data Sheet has been prepared according to Regulation on Preparation of Safety Data Sheets for Hazardous Substances and Mixtures (13.12.2014-29204 Turkish Official Gazette).

Prepared by

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The Material Safety Data Sheet is prepared according to the information given by manufacturer and reliable literature references available on the date preparation. Although maximum effort expended for the accuracy of the information, the accuracy of information on this document is not guaranteed . The precautions and advices given in this document may not be applicable/sufficient to all individuals and/or cases. Using the product safely and following related laws/regulations is the responsibility of the user. Also, the manufacturer is not responsible from any damage and/or injury that might be a result of not following the precautions and/or advices given in this document.