AFRIMAT®

MSDS

MATERIAL SAFETY DATA SHEET (MSDS) for PORTLAND CEMENT, BLENDED PORTLAND CEMENTS, PORTLAND COMPOSITE CEMENTS and POZZOLANIC CEMENTS

November 2023 – Revision (product list update)

SECTION 1

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product names

CEM I 52,5 R	Rapidcem
CEM I 52,5 R	Fastcast
CEM II/A-V 52,5 N	Powercrete plus
CEM II/A-V 52,5 N	Fastcast
CEM II/A-V 52,5 N	Rapidcem
CEM II/A-L 52,5 N	Powercrete plus
CEM II/A-M (V-L) 42,5 R LH	Powercrete plus
CEM II/B-M (V-L) 42.5 N	Buildcrete
CEM IV/A-V 42,5 N	Buildcrete
CEM IV/B-V 42,5 N	Buildcrete
CEM II/B-M (V-S) 32,5 N	RoadCem
CEM II/B-L 32,5 N	RoadCem
CEM II/B-L 32,5 N	DuraBuild
CEM IV/B-V 32,5 N	DuraBuild
CEM V/A 32,5 N	RoadCem
CEM V/A 32,5 N	DuraBuild

Physical description and use

Portland cement is a light grey powder that is used as a construction material in concrete, mortar and plaster. It is supplied in bulk form to large volume users and is also sold in paper bags, mainly 50kg in size but also some in 25kg.

MSDS information

This MSDS was updated in November 2023.

Chemical family

Calcium salts. Predominantly calcium silicate salts together with other calcium salts containing iron and aluminium make up the major part of this product.

Chemical name and synonyms

Portland cement. Portland cement is also known as hydraulic binder.

Formulation

These products consist of finely-ground Portland cement clinker mixed with a small amount of calcium sulphate (gypsum – to regulate setting). Limestone, fly ash and Ground Granulated Blast-Furnace Slag ('slag') are used as enhancers (in combination or by themselves).

Supplier/Manufacturer

Afrimat Industries South Africa (Pty) Ltd
Tyger Valley Office Park Building 2
Cr Old Oak Road & Willie Van Schoor Ave
Bellville, Cape Town, 7530
Tel: 021 917 8840
www.afrimat.co.za

Manufacturing sites

Lichtenburg
1 Manana Road, Industrial Site
Lichtenburg, 2740
Randfontein
c/o Condor Road and R559 Finsbury
Randfontein, 1759

General contacts

011 657 0000	Longmeadow Head Office, Johannesburg
018 633 3000	Lichtenburg Plant, North West Province
011 278 7300	Randfontein Grinding Station, Gauteng
011 972 6146	Kaalfontein, Gauteng
015 297 3573	Polokwane, Limpopo

Laboratory and technical development

011 226 3600
Integrated Solutions and Innovation Centre (ISIC)

Emergency contacts

Health: 011 657 0000
Transportation: 011 657 0000

SECTION 2

HAZARDS IDENTIFICATION

Identification

There is not a GHS (Globally Harmonised System) classification and labelling of chemicals identity for cement. Classification and labelling complies with SANS 10234.

Emergency Overview

Portland cement is a light grey powder that poses little immediate hazard. A single short-term exposure to the dry powder is not likely to cause serious harm.

Most important

Wet Portland cement is alkaline and exposure of sufficient duration can cause serious, potentially irreversible tissue (skin or eye) destruction in the form of chemical (caustic) burns. The same type of tissue destruction can occur if wet or moist areas of the body are exposed for sufficient duration to dry Portland cement.

Potential health effects

Relevant Routes of Exposure:

Eye contact, skin contact, inhalation and ingestion.

Effects resulting from eye contact:

Exposure to airborne dust may cause immediate or delayed irritation or inflammation. Eye contact by larger amounts of dry powder or splashes of wet Portland cement may cause effects ranging from moderate eye irritation to chemical burns and blindness. Calcium oxide may cause acute corneal damage if sufficient amounts contact the cornea. Such exposures require immediate first aid (see Section 4) and medical attention to prevent significant damage to the eye.

Effects resulting from skin contact:

Discomfort or pain cannot be relied upon to alert a person to a hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimising skin contact, particularly contact with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred. Exposure to dry Portland cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation of other conditions.

Dry Portland cement contacting wet skin or exposure to moist or wet Portland cement may cause more severe skin effects including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (alkali) chemical burns and could cause 'contact dermatitis'. Persons already sensitised may react to their first contact with the product. Other persons may only experience this effect, for the first time, after years of contact with Portland cement products.

Effects resulting from inhalation:

Exposure to Portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose. Portland cement may contain trace amounts of free crystalline silica. Prolonged exposure to respirable free crystalline silica can aggravate other lung conditions and cause silicosis, a disabling and potentially fatal lung disease. Iron oxide contained in fly ash, upon chronic exposure, may result in iron pigmentation of the lungs, siderosis, and benign pneumoconiosis. (Also see 'Carcinogenic potential' below).

Effects resulting from ingestion:

Although small quantities of dust are not known to be harmful, ill effects are possible if larger quantities are consumed. Portland cement should not be eaten.

Carcinogenic potential:

NTP, OHSA, or IARC do not list Portland cement as a carcinogen. It may, however, contain trace amounts of substances listed as carcinogens by these organisations. Crystalline silica, a potential trace level contaminant in Portland cement, is now classified by IARC as a known human carcinogen (Group 1). NTP has characterised respirable silica as 'reasonably anticipated to be [a] carcinogen'.

Medical conditions, which may be aggravated by inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.

SECTION 3

COMPOSITION / INFORMATION ON INGREDIENTS

Component Name	mg/m³	CAS No.
Tri-Calcium Silicate	<70	12168-85-3
Di-Calcium Silicate	<40	10034-77-2
Tetra-Calcium-Alumino-Ferrite	<18	12068-35-8
Tri-Calcium Aluminate	<15	12042-78-3
Calcium Sulfate	<10	Various
Calcium Carbonate	<35	1317-65-3
Magnesium Oxide	< 5	1309-48-4
Calcium Oxide	<0.5	1305-78-8
Crystalline Silica	<0.2	14808-60-7
Chromates	<0.5	7440-47-3

Note: CAS = Chemical Abstracts Service

	OHS - ACT EXPOSURE LIMITS
	TWA OEL - RL
Component Name	**mg/m³**
Portland cement (CAS# 65997-15-1)	
(Respirable dust)	5
(Total Dust)	10
Calcium Sulfate (Gypsum)	
(Respirable dust)	5
(Total dust)	10
Calcium carbonate	
(Respirable dust)	5
(Total dust)	10
Magnesium Oxide	10
Calcium Oxide	2
Crystalline Silica Quartz	
Quartz (Respirable)	0.4
Chromates	0.5

Note: TWA = Time-weighted average exposure

OER - RL = Occupational Exposure Limit - Recommended Limit for Hazardous Substances

Trace constituents

Portland cement is made largely from limestone (calcium carbonate) and other materials mined from the earth, and is processed using heat provided by fossil fuels. As a result, trace amounts of naturally occurring, potentially harmful chemicals might be detected in the cement during chemical analysis. For example, Portland cement may contain up to 0.75% insoluble residue, some of which may be free crystalline silica. Other trace constituents may include calcium oxide (also known as lime or quick lime), magnesium oxide, potassium sulfate, sodium sulfate, chromium compounds, and nickel compounds.

SECTION 4

FIRST AID MEASURES

Eyes

Immediately flush eyes thoroughly with water. Continue flushing eyes for at least 15 minutes, including under lids, to remove all particles. Call for medical assistance immediately.

Skin

Wash skin with cool water and pH-neutral soap or mild detergent. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of Airborne Dust

Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. (Inhalation of large amounts of Portland cement requires immediate medical attention)

Ingestion

Do not induce vomiting. If conscious, have the victim drink plenty of water and call for medical assistance immediately.

SECTION 5
FIRE-FIGHTING MEASURES

Flash point*	None
Lower Explosion Limit	None
Upper Explosion Limit	None
Auto ignition temperature	Not combustible
Extinguishing media	Not combustible
Special fire fighting procedures	None
Hazardous combustion products	None
Unusual fire and explosion hazards	None

*Unknown

SECTION 6
ACCIDENTAL RELEASE MEASURES

Collect dry material using a scoop. Avoid actions that cause dust to become airborne. Avoid inhalation of dust and contact with skin. Wear appropriate personal protective equipment as described in Section 8. Scrape up wet material and place in a disposable container. Allow the material to 'dry' before disposal. Do not attempt to wash Portland cement down drains. Dispose of waste material according to local municipal regulations.

SECTION 7
HANDLING AND STORAGE

Keep Portland cement dry until used. Normal temperatures and pressures do not affect the material. Promptly remove dusty clothing or clothing which is wet with cement liquids and launder before reuse. Wash thoroughly after exposure to dust or wet mixtures or liquids.

SECTION 8
EXPOSURE CONTROLS AND PERSONAL PROTECTION

Skin protection

Prevention is essential to avoiding potentially severe skin injury. Avoid contact with unhardened Portland cement. If contact occurs, promptly wash affected area with soap and water. Where prolonged exposure to unhardened Portland cement products might occur, wear impervious clothing and gloves to eliminate skin contact. Where required, wear sturdy boots that are impervious to water to eliminate foot and ankle exposure.

Do not rely on barrier creams; barrier creams should not be used in place of gloves.

Periodically wash areas contacted by dry Portland cement or by wet cement or concrete liquids with a pH neutral soap. Wash again, after the task has been completed. If, at any time, skin irritation is experienced, immediately wash the affected area and seek treatment.
Clothing that has become saturated with wet concrete should be removed and replaced with clean dry clothing, after washing any affected areas of skin.

Respiratory protection

Avoid actions that cause dust to become airborne. Use local and general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MHSA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation.

Ventilation

Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye protection

Where eyes are exposed to the risk of splashes or puffs of cement, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury.
Contact lenses should not be worn when working with Portland cement or fresh cement products.

SECTION 9
PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Grey powder
Odour	No distinct odour
Physical state	Solid (powder)
Solubility in water	Slightly soluble (0.1 to 1.0%)
Vapour pressure	Not applicable
Vapour density	Not applicable
Boiling point	Not applicable (i.e. >1000°C)
Melting point	Not applicable (> 1500°C)
Specific gravity (H2O = 1.0)	2,2 – 3,2
Evaporation rate	Not applicable
Flammability	Not applicable

SECTION 10
STABILITY AND REACTIVITY

Stability	Stable.
Conditions to avoid	Unintentional contact with water.
Incompatibility	Wet Portland cement is alkaline. As such it is incompatible with acids, ammonium salts and phosphorous. Fly ash will react violently with bromine trifluoride, fluorine, hydrogen fluoride, and phosphorus.
Hazardous decomposition	Will not spontaneously occur. Adding water produces (caustic) calcium hydroxide.
Hazardous polymerisation	Will not occur.

SECTION 11
TOXICOLOGICAL INFORMATION

Summary of toxicology

Cement dust may irritate the eyes and may cause dermatitis. There are reports of increased incidence of bronchitis and chest x-ray changes after prolonged heavy exposure to undefined mixtures of cement and other dusts. Exposure to cement can cause chronic conjunctivitis, blepharitis, and skin ulcers of the nose. Repeated and prolonged skin contact with cement can result in dermatitis of the hands, forearms and feet – this is a primary irritant dermatitis and may be complicated in some instances by allergic reactions.

Refer also to Section 2.

SECTION 12
ECOLOGICAL INFORMATION

Eco-toxicity

No recognised unusual toxicity to plants or animals.

Aquatic toxicity (Fish, Daphnia and Algae)

Non-toxic in small quantities. Large quantities especially in static water will result in an increase in pH up to pH 12 or more. pH changes may result in death of aquatic life.

SECTION 13

DISPOSAL CONSIDERATIONS

Dispose of waste material according to local municipal, provincial and national regulations. (Since Portland cement is stable, dry uncontaminated material may be saved for future use.) Dispose of bags in an approved landfill or incinerator.

SECTION 14

TRANSPORT INFORMATION

Hazardous materials description/proper shipping name Portland cement is not hazardous under National Road Traffic Act, Act 93 of 1996 regulations and SANS 10228 (The identification and classification of dangerous goods for transport).

Hazard class	Not applicable
Identification number	Not applicable
Required label text	Not applicable
Hazardous substances/reportable quantities (RQ)	Not applicable
U.N. number	Portland cement and cement blends are not hazardous cargo in terms of the International Maritime Dangerous Goods Code and as such do not have a U.N. number

SECTION 15

REGULATORY INFORMATION

Status under OHSA, Act 85 of 1993 Reg.1179 dd 25/08/95:
Portland cement is considered a “hazardous chemical” under this regulation*, and should be part of any hazard communication programme.

*Recommended exposure limits are for dust concentrations only

SECTION 16

OTHER INFORMATION

Prepared by: Integrated Solutions and Innovation Centre (ISIC)
Approved by: Afrimat Industries South Africa (Pty) Ltd
Approval date or Revision date: November 2023

Other important information

Portland cement should only be used by knowledgeable persons. To use the product safely, it is essential the user recognises that Portland cement reacts chemically with water, and that some of the intermediate products of this reaction (that is, those present while a Portland cement product is ‘setting’) pose a far more severe hazard than Portland cement itself.

While the information provided in this Material Safety Data Sheet is believed to provide a useful summary of the hazards of Portland cement as it is commonly used, the sheet cannot anticipate and provide all of the information that may be needed in every situation.

Inexperienced product users should obtain proper training before using this product.

Seller makes no warranty, expressed or implied, concerning the product or the seller’s ability or fitness thereof for any purpose or concerning the accuracy of any information provided, except that the product shall conform to contracted specifications.

The information provided herein, is believed to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. Buyer’s exclusive remedy shall be for damages and no claim of any kind, whether as to product delivered or for non-delivery of product, and whether based on contract, breach of warranty, negligence, or otherwise, shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer’s claim is based on contract, breach of warranty, negligence or otherwise.

In particular, the data furnished in this sheet does not address hazards that may be posed by other materials mixed with Portland cement to produce Portland cement products. Users should review other relevant Material Safety Data Sheets before working with Portland cement or working on Portland cement products, for example, Portland cement concrete.