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Health and Safety data sheet for Common Cements and Cement Products

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

1.1 Identification of substance/preparation

Cement. An odourless white to grey powder slightly soluble in water.

This data sheet applies to the following products containing cement: Castle Multicem; Castle Cement; Castle Ordinary Portland Cement (OPC); Castle High Strength 52,5; Hanson/Castle Rapid Hardening Portland Cement (RHPC); Castle Sulfate-resisting; Castle/Hanson White Cement; Castle Masonry; Castle Quickcem; Hanson/Castle High Alumina; Castle Portland – Limestone Cement; Castle Portland – Fly Ash Cement; Castle General Purpose Grouts; Castle Depocrete; Castle Protomix; Hanson multipurpose concrete; Hanson 40N concrete; Hanson Postfix; Castle Readybag High Performance Post Mix and Hanson Sand Cement Mortar.

1.2 Use of the substance/preparation

Common cement is used as a hydraulic binder for the production of concrete, mortars, grout etc.

1.3 Company identification

Hanson Cement Limited
Ketton
Stamford
Lincolnshire
PE9 3SX

Hanson Cement Technical Helpline
tel: 0845 722 7853
fax: 01780 727154
e-mail: cement.technical.help@hanson.biz

1.4 Emergency telephone

Telephone: 0845 722 7853

2. HAZARDS IDENTIFICATION

When cement is mixed with water such as when making concrete or mortar, or when the cement becomes damp, a strong alkaline solution is produced. If this comes into contact with the eyes or skin it may cause serious burns and ulceration. The eyes are particularly vulnerable and damage will increase with contact time.

2.1 Hazard characterisation

Xi Irritant
R37/38 Irritating to respiratory system and skin
R41 Risk of serious damage to eyes
R43 May cause sensitisation by skin contact

2.2 Primary routes of entry

Inhalation: Yes
Skin/eyes: Yes
Ingestion: No, except in accidental cases

2.3 Human health

Inhalation: Frequent inhalation of large quantities of cement dust over a long period of time increases the risk of developing lung diseases.

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

Skin: Strong alkaline solutions in contact with the skin tend to damage the nerve endings first before damaging the skin, therefore chemical burns can develop without pain being felt at the time. Hence, prolonged skin contact with wet cement, fresh concrete or mortar may cause serious burns.

Cement, mortar and concrete mixes may, until set, cause irritant dermatitis: Irritant contact dermatitis is due to a combination of the wetness, alkalinity and abrasiveness of the constituent materials. If used outside of the declared shelf life, there may be a risk of allergic dermatitis. Allergic dermatitis is caused mainly by the sensitivity of an individual's skin to soluble chromium (VI).

2.4 Environment

Under normal use, the product is not expected to be hazardous to the environment.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Chemical composition

Common cement types according to the EN 197-1 (Common cements and EN 197-4 (Blast furnace cements). The principal constituents of these cements are calcium silicates, aluminates, ferro-aluminates and sulfates. Small amounts of alkalis, lime, magnesia and chlorides are also present together with trace amounts of chromium compounds. Additional constituents may also be present e.g. pulverised-fuel ash, limestone, clay and granulated blast furnace slag.

3.2 Components presenting a health hazard

| Substance | Concentration range (by weight in cement) | EINECS | CAS | Symbol (C&L) | R |
|-------------------------|--|-----------|------------|-----------------|--------------------------|
| Portland Cement Clinker | 5 – 95% | 266-043-4 | 65997-15-1 | Xi | R37 R38 R41 R43 |

4. FIRST AID MEASURES

If medical advice is sought take this safety datasheet with you.

4.1 Inhalation

If irritation occurs, move to fresh air. If nose or airways become inflamed seek medical advice.

4.2 Eye contact

A speedy response is essential in order to avoid permanent damage to the eyes. Wash eyes immediately with plenty of clean water for at least 15 minutes and seek medical advice without delay.

4.3 Skin contact

Wash the affected area thoroughly with soap and water before continuing. If irritation, pain or other skin trouble occurs, seek medical advice. Clothing, footwear, watches etc contaminated by wet cement, concrete or mortar should be removed and washed thoroughly before use.

4.4 Ingestion

Do not induce vomiting. If person is conscious, wash out mouth with water and give plenty of water to drink. After significant ingestion seek immediate medical attention.

5. FIRE-FIGHTING MEASURES

Cements are non-flammable and non-explosive. They will not facilitate combustion with other materials and all types of extinguishing media are suitable. No additional specialist equipment is required by fire fighters.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal protective measures

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

6.2 Environmental protection measures

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

6.3 Methods for cleaning up

Recover the spillage in a dry state if possible. Keep children away from clean up operations.

Dry cement

- Use dry clean up methods that do not cause airborne dispersion, for example an industrial vacuum cleaner equipped with high efficiency particulate filters (HEPA filter) or an equivalent technique or;

- Clear up the dust by mopping, wet brushing or by spraying with water (fine mist to avoid the dust becoming airborne) and remove slurry.

Wet cement

Clean up wet cement and place in a container. Allow material to dry and solidify before disposal as described under Heading 13

7. HANDLING & STORAGE

7.1 Handling

When handling cement bags, due regard should be paid to the risks outlined in the Manual Handling Operations Regulations. Some bags may have a small amount of cement on the outer surface. Appropriate personal protective clothing (see Heading 8) should therefore be used whilst handling.

Avoid generating dust:-

For bagged cement used in open ended mixers: first add water and then carefully add the cement. Keep the height of the fall low. Start the mixing smoothly. Do not compress empty bags, except when contained in another clean bag

7.2 Storage

Bulk cement must be stored in silos that are waterproof, clean and protected from contamination, dry (internal condensation minimised) with stock rotated in chronological order of the despatch dates marked on delivery tickets.

Engulfment Hazard: To prevent burial or suffocation, do not enter a confined space, such as a silo, bin or bulk truck, or other storage container or vessel that stores or contains cement without taking the proper safety measures. Cement can build-up or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Packed products must be stored in unopened bags clear of the ground in cool, dry conditions and protected from excessive draught. Bags should be stacked in a safe and stable manner.

7.3 Control of soluble Chromium (VI)

For cements treated with a Cr (VI) reducing agent according to the regulations given in Heading 15, the effectiveness of the reducing agent diminishes with time. Therefore cement bags and/or delivery documents will contain information on the period of time (shelf life) for which the reducing agent will continue to maintain the level of soluble Cr (VI) below the imposed limit of 0.0002%, according to EN 197-10. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure limit values

WEL 8hr Time Weighted Average (TWA)

10mg/m³ total inhalable dust

4mg/m³ respirable dust

8.2 Exposure controls

8.2.1 Occupational exposure controls

Respiratory protection: Suitable respiratory protection should be worn to ensure that personal exposure is less than the WEL. This should conform to the relevant EN standard.

Eye protection: Dust-proof goggles should be worn wherever there is a risk of cement powder or any cement/water mixture entering the eye. This should conform to EN 166.

Hand and skin protection: Use waterproof, abrasion and alkali resistant gloves.

Waterproof clothing gloves and boots should be worn which ensure that cement, or any cement/water mixture, e.g. concrete or mortar, does not come into contact with the skin. In some circumstances such as when laying concrete, waterproof trousers and wellingtons may be necessary. Particular care should be taken to ensure that wet concrete does not enter the boots and persons do not kneel on the wet concrete so as to bring the wet concrete into contact with unprotected skin. Should wet mortar or wet concrete get inside boots, gloves or other protective clothing then this protective clothing should be immediately removed and the skin thoroughly washed as well as the protective clothing/footwear.

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

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

8.2.1 Environmental exposure controls

According to available technology.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information

Dry cement is a finely ground inorganic material (odourless, grey or white powder).

9.2 Physical data

Mean particle size: 5-30 microns

Solubility in water (T=20 °C): slight (0.1-1.5 g/l)

Density: 2750-3200 kg/m³

Apparent density (ES): 900-1500 kg/m³

pH (T=20 °C in water): 11-13.5

Boiling/melting point: >1250 °C

Vapour pressure, vapour density, evaporation rate, freezing point, viscosity, flash point (not flammable), explosive properties (not explosive): Not relevant

10. STABILITY AND REACTIVITY

10.1 Conditions to avoid

Dry cements are stable as long as they are stored properly (see Heading 7) and are compatible with most other building materials. When mixed with water, cements will harden into a stable mass that is not reactive to normal environments.

10.2 Materials to avoid

Uncontrolled use of aluminium powder in wet cement should be avoided as hydrogen is produced.

10.3 Hazardous decomposition products

Cements will not decompose into other hazardous by-products and do not polymerise.

11. TOXICOLOGICAL INFORMATION

11.1 Short term effects

- Eye contact – cement is a severe eye irritant. Mild exposure can cause soreness. Gross exposures or untreated mild exposures can lead to chemical burning and ulceration of the eye.
- Skin contact – cement powder or any cement/water mixture may cause chemical burns and/or irritant contact dermatitis. If used outside of the declared shelf life, there may be risk of allergic dermatitis.
- Acute dermal toxicity: Acute dermal toxicity: limit test, rabbit, 24 hours contact, 2.000 mg/kg body weight – no lethality [Reference (2)].
- Ingestion – the swallowing of small amounts of cement or any cement/water mixtures is unlikely to cause any significant reaction. Larger doses may result in irritation to the gastrointestinal tract.
- Inhalation – cement powder may cause inflammation of mucous membranes. Coughing, sneezing and shortness of breath may occur following exposures in excess of occupational exposure limits.

11.2 Chronic effects

- a) Inhalation – Chronic exposure to respirable dust in excess of occupational exposure limits may cause coughing, shortness of breath and may cause chronic obstructive lung disease (COPD)
- b) Carcinogenicity – a casual association between cement exposure and cancer has not been established [reference (1)].
- c) Contact dermatitis/Sensitising effects – Some individuals may exhibit eczema upon exposure to wet cement caused either by the high pH which induces irritant contact dermatitis, or by an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis [Reference (4)]. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis and is a combination of those two mechanisms. An exact diagnosis is often difficult. If the cement contains a soluble Cr (VI) reducing agent and as long as the mentioned period of effectiveness is not exceeded, a sensitising effect is not expected [Reference (3)].

11.3 Medical conditions aggravated by exposure

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

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

The product is not expected to be hazardous to the environment (LC50 aquatic toxicity rating not determined). The addition of cements to water will, however, cause the pH to rise and may therefore be toxic to aquatic life in some circumstances.

12.2 Mobility

Dry cement is not volatile but might become airborne during handling operations.

12.3 Persistence and degradability/Bio accumulative potential/results of PBT assessment/other adverse effects

Not relevant. After hardening, cement presents no toxicity risks.

13. DISPOSAL CONSIDERATIONS

13.1 Product – cement that has exceeded its shelf life

When demonstrated that it contains more than 0,0002% soluble Cr (VI): shall not be used/sold other than for use in controlled closed and totally automated processes or should be recycled or disposed of according to current National or Devolved Administration legislation or treated again with a reducing agent.

13.2 Product – unused residue or dry spillage

Pick up dry. Mark the containers. Possibly re-use depending upon shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to 13.4.

13.3 Product - slurries

Allow to harden, avoid entry in sewage and drainage systems or into bodies of water (e.g. streams) and dispose of as indicated in 13.4.

13.4 Product – after addition of water, hardened

Dispose of according to the current National or Devolved Administration legislation. Avoid entry into the sewage water system.

13.5 Packaging

Completely empty the packaging and process it according to current National or Devolved Administration legislation.

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. No special precautions are needed apart from those mentioned under Heading 8.

15. REGULATORY INFORMATION

15.1 Classification and labelling of cement according to 1999/45/EC



Xi Irritant

Risk phrases

- Risk of serious damage to eyes.
- Skin contact with wet cement, fresh concrete or mortar may cause irritation, dermatitis or burns.
- Contact between cement powder and body fluids (e.g. sweat and eye fluid) may also cause skin and respiratory irritation, dermatitis or burns.

- Contains chromium (VI). May produce an allergic reaction.

Safety phrases

- Avoid eye and skin contact by wearing suitable eye protection, waterproof clothing, waterproof footwear and waterproof gloves.
- Clothing contaminated by wet cement should be removed immediately and washed before re-use.
- Avoid breathing dust.
- Keep out of reach of children.
- On contact with eyes or skin, rinse immediately with plenty of clean water. Seek medical advice after eye contact.

15.2 The marketing and use of cement is subject to a restriction on the content of soluble Cr (VI)

15.3 UK legislation/requirements

- CONIAC Health Hazard Information Sheet No. 26 (CEMENT)
- Health and Safety at Work etc Act 1974
- Control of Substances Hazardous to Health (Regulations)
- PORTLAND CEMENT DUST – criteria document for an occupational exposure limit. June 1994 (ISBN 07176 – 0763 – 1)
- HSE Guidance Notes EH26 (Occupational Skin Diseases – Health and Safety Precautions)
- HSE Guidance Note EH40 (Workplace Exposure Limits)
- Any authorised manual on First Aid by St. John's/ St. Andrew's/Red Cross
- Manual Handling Operations Regulations
- Environmental Protection Act

16. OTHER INFORMATION

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 Lethal Concentration where 50% of the test animals die.
- OEL occupational exposure limit
- WEL workplace exposure limit
- TWA: Time Weighted Averages

References

- (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).
- (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.

The information on this data sheet reflects the currently available knowledge 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 responsibility of the user. It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering their own activities.

Please note: Reference to a Technical Standard number in this leaflet is deemed to include the latest published edition and/or any published amendments issued after the standard's publication, unless a date of issue is quoted in which case reference is to the provisions stated in that edition.

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For further information please contact:

Hanson Cement
Ketton
Stamford
Lincolnshire
PE9 3SX

Technical Helpline:

Tel: 0845 722 7853
(calls charged at local rate)
Fax: 01780 727154
Email: cement.technical.help@hanson.biz

Customer Services:

Tel: 0845 600 1616
(calls charged at local rate)
Fax: 01780 727008
Email: cement.customer.services@hanson.biz