Hazardous Material Safe System of Work

Material: Cement/Concrete/Mortar

Hazard Summary

- May cause sensitisation by skin contact
- Risk of serious damage to eyes
- Contact with wet cement, wet concrete or wet mortar may cause irritation, dermatitis or burns
- Contact between cement powder and bodily fluids (e.g. sweat and eye fluid) may also cause skin and respiratory irritation, dermatitis or burns
- Contains Chromium (VI) - may cause allergic reaction

Safety Measures

- Avoid eye and skin contact by wearing suitable eye protection, clothing and gloves
- 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

Emergency Action

Eye Contact - Wash eyes immediately with plenty of clean water for at least 15 minutes and seek medical advice without delay.
Skin Contact - Wash the affected area thoroughly with soap and water before continuing. If irritation, pain or other skin conditions occur, seek medical advice. Clothing contaminated by wet cement, concrete or mortar should be removed and washed thoroughly before use.
Ingestion - Do not induce vomiting. Wash out mouth with water and give patient plenty of water to drink.
Inhalation - If irritation occurs, move to fresh air. If nose or airways become inflamed seek medical advice.

WARNING

Wet cement, concrete or mortar may cause alkali burns if in direct contact with skin. You MUST wear the appropriate protective clothing at all times when working with cement, concrete or mortar.

Associated Risks:

Bags should be stacked in a safe and stable manner, away from any moisture.
When handling bags take care when lifting (Manual Handling Safe System of Work).
Some bags may have a small amount of cement on the outer surface. Appropriate personal protective clothing should therefore be used whilst handling.

Material Safety Data Sheet available at head office
MATERIAL SAFETY DATA SHEET
Cement, Concrete and Mortar

Identification of substance/preparation
Company: RMC Packed Products Limited
RMC House
Evreux Way
Rugby
Warwickshire CV21 2DT.
Telephone: 0808 145 1900
Fax: 01788 514742

Products:
Cement
Concrete
Mortar

Hazard Information

2. Composition/Information on Ingredients
Cement - An odourless white to grey powder insoluble in water. When water is added it becomes a binder for construction applications.
Concrete - An odourless mixture of cement and natural aggregates (gravel and sand). Supplied dry and pre-mixed.
Mortar - An odourless mixture of cement and natural aggregates (sand). Supplied dry and pre-mixed.

2.1 Chemical Description
The principal constituents of cement are calcium silicates, aluminates, and sulphates. Small amounts of alkalis, lime 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. Other minor chemical additives may also be present. The natural aggregates in concrete/mortar contain a combination of various minerals, including silica.

2.2 Hazardous Ingredients
a. The lime, calcium silicates and alkalis within the cement are partially soluble and when mixed with water will give rise to a potentially hazardous alkaline solution.
b. Hexavalent chromium salts in the cement are soluble and when mixed with water, will give rise to a potentially hazardous solution.
c. Salts of organic acid within the air entraining agents are soluble and when mixed with water will contribute to the alkalinity of the solution.
d. Airborne dust from the natural aggregates in dry concrete mixes may contain respirable silica. Long-term prolonged exposure to high levels of respirable crystalline silica, which can arise from failure to implement adequate control measures, can lead to silicosis and ultimately an increased risk of developing lung cancer.

3. Hazards Identification

3.1 When cement is mixed with water such as when making concrete or mortar, or when the cement becomes damp from contact with sweat or tears, 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. 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.

3.2 Cement mortar and concrete mixes may until set cause both irritant and allergic contact dermatitis:
• Irritant contact dermatitis is due to a combination of the wetness, alkalinity and abrasiveness of the constituent materials.
• Allergic contact dermatitis is caused mainly by the sensitivity of an individual’s skin to hexavalent chromium salts.

Emergency Action

4. First Aid Measures
4.1 Eye Contact
Wash eyes immediately with plenty of clean water for at least 15 minutes and seek medical advice without delay.
4.2 Skin Contact
Wash the affected area thoroughly with soap and water before continuing. If irritation, pain or other skin conditions occur, seek medical advice. Clothing contaminated by wet cement, concrete or mortar should be removed and washed thoroughly before use.
4.3 Ingestion
Do not induce vomiting. Wash out.

5. Fire Fighting Measures
Cement, Concrete and Mortar are not flammable and will not facilitate combustion with other materials.

6. Accidental Release Measures
6.1 Personal Precautions (See 8.3.)
6.2 Cleaning Up
Recover the spillage in a dry state if possible. Minimise generation of airborne dust. The product can be slurried by the addition of water but will subsequently set as a hard material. Keep children away from clean up operation.

6.3 Environmental Measures
Prevent from entering drains, sewers or water courses.

Precautions

7. Storage and Handling
7.1 Storage
Bags should be stacked in a safe and stable manner, away from any moisture.
7.2 Handling
When handling bags take care when lifting, due regard should be paid to the risks outlined in the Manual Handling Operations Regulations 1992.
Some bags may have a small amount of cement on the outer surface. Appropriate personal protective clothing (see 8.3) should therefore be used whilst handling.
8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Occupational Exposure Standard (OES) values of 10 mg/m\(^3\) total inhalable dust and 4 mg/m\(^3\) respirable dust (8 hour TWA) are listed in EH40 for calcium silicate, pulverised fuel ash and limestone. Maximum exposure limits of 0.05 mg/m\(^3\) and 0.3 mg/m\(^3\) are listed for Chromium (IV) compounds and respirable silica respectively (8 hour TWA). It should however be noted that the Health and Safety Executive have stated in their Chemical Hazard Alert Notice on Respirable Crystalline Silica (CHAN 35 published April 2003) that it should now be reasonably practicable for all industry sectors to control respirable crystalline silica exposure to 0.1 mg/m\(^3\) (8 hour TWA) or below.

8.2 Engineering Measures

Where reasonably practicable dust exposures should be controlled by engineering methods.

8.3 Personal Protective Equipment

a. Respiratory Protection

Suitable respiratory protection should be worn to ensure that personal exposure is less than the exposure limit values. Always ensure good ventilation.

b. Hand and Skin Protection

Protective clothing should be worn which ensures 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 gloves, 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.

c. Eye Protection

Dust-proof goggles should be worn whenever there is a risk of cement powder or any cement/water mixture entering the eye.

WARNING

Wet cement, concrete or mortar may cause alkali burns if in direct contact with skin. You MUST wear the appropriate protective clothing at all times when working with cement, concrete or mortar.

Product Information

9. Physical/Chemical Properties

Detailed properties will vary according to:

i) the specific cement, concrete or mortar.

ii) the ingredients added to affect the working characteristics of the material.

9.1 Physical Data

Physical State Particulate
Mean particle size 5-30 micron
(Cement)
1-100 microns
(Concrete/Mortar)
Odour N/A
pH pH of wet cement 12-14
pH of wet concrete/mortar 9-12
Viscosity N/A
Freezing point N/A
Boiling point N/A
Melting point N/A
Flash point N/A (not flammable)
Explosive properties N/A
Density 2800-3200 kg/m\(^3\) (Cement)
Dry Bulk Density 1100 - 1600 kg/m\(^3\)
Solubility N/A

9.2 Chemical Compounds - Cement

Mainly a mixture of: 3CaO – SiO\(_2\)
2CaO – SiO\(_2\)
3CaO – Al\(_2\)O\(_3\)
4CaO – Al\(_2\)O\(_3\) – Fe\(_2\)O\(_3\)
Contains less than 1% crystalline Silica.

10. Stability and Reactivity

Conditions contributing to chemical instability: none.
Hazardous decomposition products: none.
Special precautions: none.
Reacts with moisture to become alkaline.

11. Toxicological Information

11.1 Short Term Effects

a. 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.

b. Skin

Cement powder or any cement/water mixture may cause irritant contact dermatitis, allergic (chromium) dermatitis, and/or burns.

c. Ingestion

The swallowing of small amounts of cement or any cement/water mixtures is unlikely to cause significant reaction. Large doses may result in irritation to the gastrointestinal tract.

d. Inhalation

Cement powder may cause inflammation of mucous membranes.
11.2 Chronic Effects
High repeated exposures in excess of the OES have been linked with tinnitus and coughing. Skin exposure has been linked to allergic (chromium) dermatitis. Allergic dermatitis more commonly arises through contact with cement/water mixtures than dry cement or dry pre-mixed concrete or mortars.

12. Ecological Information
12.1 Aquatic Toxicity Rating
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 Biological Oxygen Demand (BOD)
Not applicable

13. Disposal Considerations
Dispose of empty bags or surplus cement to a place authorised to accept builders waste. Keep out of reach of children.

Additional Information

14. Transport Information
Classification for conveyance — not required.

15. Regulatory Information
15.1 Chemicals (Hazardous Information & Packaging for Supply) Regulations 2002 Classification - Irritant
(+hazard symbol)

15.2 Risk/Safety Phrases
Risk Phrases
• May cause sensitisation by skin contact
• Risk of serious damage to eyes
• Contact with wet cement, wet concrete or wet mortar may cause irritation, dermatitis or burns
• Contact between cement powder and bodily fluids (e.g. sweat and eye fluid) may also cause skin and respiratory irritation, dermatitis or burns
• Contains Chromium (VI) may cause allergic reaction

Safety Phrases
• Avoid eye and skin contact by wearing suitable eye protection, clothing and gloves
• 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

16. Legislation and Other Information
• CONIAC Health Hazard Information Sheet No 26 (CEMENT)
• Health & Safety at work etc. Act 1974.
• Control of Substances Hazardous to Health Regulations (COSHH) 2002
• HSE Guidance Note EH40 (Occupational Exposure Limits)
• Any authorised manual on First Aid by St.John’s/St. Andrews/Red Cross
• Manual Handling Operations Regulations
• Environmental Protection Act 1990

Data Sheet prepared in accordance with directive 91/155/EEC.

Guidance references
Available from HMSO, HSE area offices, or local authority Environmental Health Departments:
• EH40/2002: Occupational Exposure Limits
• A step by step Guide to COSHH assessments (HSG(97)

Important Notes:
Data and advice in this Material Safety Data Sheet is provided to alert all purchasers and users to the possible hazards of use when the material is used as intended. The information should enable them to take the necessary precautions to protect the health and safety of personnel.
This Data Sheet does NOT constitute the user’s own assessment of workplace risk as required by other safety legislation. If purchasing on behalf of a third party who will work with the material, it is your statutory duty to pass on this information to them BEFORE such work begins.

RMC Packed Products Ltd
RMC House
Evreux Way
Rugby
Warwickshire
CV21 2DT
Tel: 0808 145 1900
Fax: 01788 514742
Email: enquiries@rmcpackedproducts.com

www.rmc.co.uk

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Phrase
R38 Irritating to the skin
R41 Risk of serious damage to the eyes
R43 May cause sensitisation
S24 Avoid contact with skin
S25 Avoid contact with eyes
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

A member of the Group

Risk Assessment available on www.fosseway.com/H&S/COSHH/Cement