

SAFETY DATA SHEET

In accordance with 1907/2006 annex II 2015/830 and 1272/2008
(All references to EU regulations and directives are abbreviated into only the numeric term)
Issued 2018-10-24
Version number 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name Multicem

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Filling materials for the construction industry
Common cements and cement containing mixtures (hydraulic binders) are used industrially, by professionals as well as by consumers in building and construction work, indoor and outdoor

1.3. Details of the supplier of the safety data sheet

Company CEMENTA AB
Box 47210
100 74 Stockholm
Sweden
Telephone 08 625 68 00
E-mail asa.nilsson@cementa.se
Website www.cementa.se

1.4. Emergency telephone number

Acute cases: Call 112, request poison information.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Skin Irritant (Category 2), H315
Irreversible Eye Effects (Category 1), H318
Specific target organ toxicity - single exposure; May cause respiratory irritation (Category 3 resp), H335

2.2. Label elements

Hazard pictogram



Signal word Danger

Hazard statements

H315 Causes skin irritation
H318 Causes serious eye damage
H335 May cause respiratory irritation

Precautionary statements

P102 Keep out of reach of children
P261 Avoid breathing dust
P280 Wear protective gloves, protective clothing and eye or face protection
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 doctor
P501 Dispose of contents and container to authorised waste disposal facility

2.3. Other hazards

Cement does not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation (EC) No 1907/2006). When flue dust accidentally comes into contact with water or when flue dust becomes damp, a strong alkaline solution is produced. Due to the high alkalinity, wet flue dust may provoke skin and eye irritation.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Note that the table shows known hazards of the ingredients in pure form. These hazards are reduced or eliminated when mixed or diluted, see Section 16d.

Constituent	Classification	Concentration
FLUE DUST, PORTLAND CEMENT		
CAS No: 68475-76-3 EC No: 270-659-9 REACH: 01-2119486767-17-0067	Skin Irrit 2, Eye Dam 1, STOT SE 3 <i>resp</i> ; H315, H318, H335	40 - 70 %
PORTLAND CEMENT		
CAS No: 65997-15-1 EC No: 266-043-4	Skin Irrit 2, Eye Dam 1, Skin Sens 1, STOT SE 3 <i>resp</i> ; H315, H318, H317, H335	40 - 70 %
FLUE DUST		
EC No: 931-322-8		10 - 15 %

Explanations to the classification and labelling of the ingredients are given in Section 16e. Official abbreviations are printed in normal font. Text in italics are specifications and/or complements used in the calculation of the classification of this mixture, see Section 16b.

SECTION 4: First aid measures

4.1. Description of first aid measures

Generally

In case of concern, or if symptoms persist, call a doctor/physician.

Upon breathing in

Allow the injured person to rest in a warm place with fresh air, if symptoms persist seek medical attention.

Upon eye contact

Immediately rinse with lukewarm water for 15 - 20 minutes with eyes kept wide open; If symptoms persist, call a doctor/physician.

Do not rub the eyes.

Upon skin contact

Remove all solid particles and flush with lots of water.

Remove contaminated clothes.

If symptoms occur, contact a physician.

Upon ingestion

Rinse mouth out thoroughly first with water, then SPIT OUT the rinse water. Drink at least half a litre of water and seek medical advice. DO NOT INDUCE VOMITING.

4.2. Most important symptoms and effects, both acute and delayed

Upon breathing in

Repeated inhalation of flue dust over a long period of time increases the risk of developing lung diseases.

Upon eye contact

Eye contact with cement (dry or wet) may cause serious eye damage that may be permanent.

Upon skin contact

Cement may irritate skin that is moist (due to sweat or humidity) after prolonged contact and can cause contact dermatitis after repeated contact. Prolonged contact with wet cement or wet concrete can cause serious burns as they develop without pain (for example, when kneeling in wet concrete, even if one is wearing pants).

4.3. Indication of any immediate medical attention and special treatment needed

Upon contact with a doctor, make sure to have the label or this safety data sheet with you.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Not combustible; Extinguished with materials intended for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

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

5.3. Advice for fire-fighters

Protective measures should be taken regarding other material at the site of the fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Do not inhale dust and avoid contact with skin, eyes and clothes when cleaning up spill.

Use recommended safety equipment, see section 8.

6.2. Environmental precautions

Avoid emissions into soil, water or air.

Avoid discharge into sewers.

6.3. Methods and material for containment and cleaning up

Dry concrete: Use sanitation methods such as vacuum sanitation and vacuum extraction (industrial portable units, equipped with highly efficient air filters (EPA and HEPA, EN 1822-1:2009) or equivalent technique) which do not lead to airborne dispersion. Never use compressed air. Alternatively clean up the dust by washing the area, wet vacuuming or by using water spray or hosing (a fine mist to avoid that the dust becomes airborne) and discard slurry. If this is not possible, discard by suspending in water (see wet concrete). When wet cleaning or vacuuming is not possible, and only dry cleaning with brush is possible, please ensure that the workers are using adequate personal protective clothing and avoid dispersing the dust. Avoid inhalation of and skin contact with the concrete. Put waste in a container. Solidify before disposal according to the description in section 13.

Wet concrete: Remove wet concrete and put it in a container. Let the substance dry and harden before disposal according to the description in section 13.

Collect the spillage in a dry state if possible.

6.4. Reference to other sections

See section 8 and 13 for personal protection equipment and disposal considerations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid handling in a manner which will raise dust.

Do not eat, drink or smoke in premises where this product is handled.

In dusty environment, wear dust mask and protective goggles.

Use protective gloves to avoid skin contact.

7.2. Conditions for safe storage, including any incompatibilities

Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.

Engulfment hazard: 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 cement without taking the proper security measures. Cement can build-up or adhere to the walls of a confined space. The cement can release, collapse or fall unexpectedly.

Packed products should be stored in unopened bags clear of the ground in cool, dry conditions and protected from excessive draught in order to avoid degradation of quality.

Bags should be stacked in a stable manner.

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 uses

No additional information for the specific end uses (see section 1.2).

7.4. Control of soluble Cr (VI)

For cements treated with a Cr (VI) reducing agent according to the regulations given in Section 15, the effectiveness of the reducing agent diminishes with time. Therefore, cement bags and/or delivery documents will contain information on the packaging date, the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below 0.0002 % of the total dry weight of the cement ready for use, according to EN 196-10.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1. National limit values

DUST, RESPIRABLE

United Kingdoms (EH40/2005)

Time-weighted-average exposure limit (TWA) 4 mg/m³

DUST, INHALABLE

United Kingdoms (EH40/2005)

Time-weighted-average exposure limit (TWA) 10 mg/m³

DNEL

No data available.

PNEC

FLUE DUST

Environmental protection target	PNEC value
Fresh water	0.044 mg/L
Marine water	0.0044 mg/L
Microorganisms in sewage treatment	10 mg/L
Soil (agricultural)	8.4 mg/kg dw

8.2. Exposure controls

During work avoid kneeling in fresh mortar or concrete wherever possible. If kneeling is absolutely necessary then appropriate waterproof personal protective equipment must be worn. Do not eat, drink or smoke when working with cement to avoid contact with skin or mouth. Before starting to work with cement, apply a barrier creme and reapply it at regular intervals. Immediately after working with cement or cement-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 cement to prevent contact with eyes.

Skin protection

Use watertight, wear- and alkali-resistant protective gloves (eg nitrile soaked cotton gloves with CE marking) internally lined with cotton; boots; closed long-sleeved protective clothing as well as skin care products (eg barrier creams) to protect the skin from prolonged contact with wet cement. Particular care should be taken to ensure that wet cement does not enter the boots. For the gloves, respect the maximum wearing time to avoid skin problems. In some circumstances, such as when laying concrete or screed, waterproof trousers or kneepads are necessary.

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 the relevant EN standard, (e.g. EN 149, EN 140, EN 14387, EN 1827) or national standard.

8.2.3. Environmental exposure controls

For limitation of environmental exposure, see Section 12.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

a) Appearance	Form: Powder. Colour: grey.
b) Odour	no smell or uncharacteristic smell
c) Odour threshold	Not indicated
d) pH	When supplied, pH is: Not indicated In working solution the pH value is: 9 - 13
e) Melting point/freezing point	>850 °C
f) Initial boiling point and boiling range	Not indicated
g) Flash point	Not indicated
h) Evaporation rate	Not indicated
i) Flammability (solid, gas)	Not applicable
j) Upper/lower flammability or explosive limits	Not indicated
k) Vapour pressure	Not indicated
l) Vapour density	Not indicated
m) Relative density	2.7 - 3.2
n) Solubility	Solubility in water: 0,1-100 g/L
o) Partition coefficient: n-octanol/water	Not applicable
p) Auto-ignition temperature	Not indicated
q) Decomposition temperature	Not indicated
r) Viscosity	Not indicated
s) Explosive properties	Not applicable
t) Oxidising properties	Not applicable

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

When the concrete is mixed with water, it hardens to a stable substance, which is not reactive in normal environments.

10.2. Chemical stability

Dry concrete is stable if stored correctly (see section 7) and it is compatible with most other building materials. It must be stored dry. Contact with incompatible materials should be avoided. Wet concrete is alkaline and incompatible with acids, ammonium salts, aluminium and other non-noble metals. Concrete dissolves in hydrofluoric acid and creates volatile silicon tetrafluoride gas. The concrete reacts with water and creates silicates and calcium hydroxide. Silicates in concrete react with strong oxidizers such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride and oxygen difluoride.

10.3. Possibility of hazardous reactions

Concrete does not cause hazardous reaction.

10.4. Conditions to avoid

Damp storage conditions may lead to formation of lumps and diminish the product quality.

10.5. Incompatible materials

Acids, ammonium salts, aluminium or other non-noble metals. Uncontrolled use of aluminium powder in wet concrete should be avoided, as hydrogen gas is formed.

10.6. Hazardous decomposition products

Does not decompose to hazardous substances.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Not indicated.

Acute toxicity

The product is not classified as acute toxic.

PORTLAND CEMENT

LD50 rat 24h: > 2000 mg/kg Dermally

LC50 rat 4h: > 5 mg/L Inhalation

LD50 rat 24h: > 2000 mg/kg Orally

Skin corrosion/irritation

Cement in contact with wet skin may cause thickening, cracking or fissuring of the skin. Prolonged contact in combination with abrasion may cause severe burns.

Serious eye damage/irritation

Direct contact with cement may cause corneal damage by mechanical stress, immediate or delayed irritation or inflammation. Direct contact by larger amounts of dry cement or splashes of wet cement may cause effects ranging from moderate eye irritation (e.g. conjunctivitis or blepharitis) to chemical burns and blindness.

Respiratory or skin sensitisation

Some individuals may develop eczema upon exposure to wet cement dust, caused either by the high pH which induces irritant contact dermatitis after prolonged contact, or by an immunological reaction to soluble Cr (VI) which elicits allergic contact dermatitis. The response may appear in a variety of forms ranging from a mild rash to severe dermatitis and is a combination of the two above mentioned mechanisms. If the cement contains a soluble Cr (VI) reducing agent and as long as the mentioned period of effectiveness of the chromate reduction is not exceeded, a sensitising effect is not expected. There is no indication of sensitisation of the respiratory system.

Germ cell mutagenicity

The criteria for classification cannot be considered fulfilled based on available data.

Carcinogenicity

The criteria for classification cannot be considered fulfilled based on available data.

Reproductive toxicity

The criteria for classification cannot be considered fulfilled based on available data.

STOT-single exposure

Cement dust may irritate the throat and respiratory tract. Coughing, sneezing, and shortness of breath may occur following exposures in excess of occupational exposure limits. Overall, the pattern of evidence clearly indicates that occupational exposure to cement dust has produced deficits in respiratory function. However, evidence available at the present time is insufficient to establish with any confidence the dose-response relationship for these effects.

STOT-repeated exposure

There is an indication of COPD. The effects are acute and due to high exposures. No chronic effects or effects at low concentration have been observed.

The criteria for classification cannot be considered fulfilled based on available data.

Aspiration hazard

The criteria for classification cannot be considered fulfilled based on available data.

SECTION 12: Ecological information

12.1. Toxicity

The product is not hazardous to the environment. Ecotoxicology tests with Portland cement and *Daphnia magna* and *Selenastrum coli* have proven insignificant toxicological effect. Therefore it has not been possible to establish values for LC50 and EC50. There are no indications for toxicity in the sediment phase. However, addition of large quantities of concrete to water can increase the pH and therefore the concrete could be toxic for aquatic organisms under certain conditions.

12.2. Persistence and degradability

The methods used to test biodegradability is not applicable on inorganic compounds.

12.3. Bioaccumulative potential

Not applicable.

12.4. Mobility in soil

Not relevant as concrete is an inorganic material. No toxicity risk is present after the concrete has cured.

12.5. Results of PBT and vPvB assessment

The criteria for PBT and vPvB do not apply to inorganic substances.

12.6. Other adverse effects

Not indicated.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste handling of the product

Product - cement that has exceeded its shelf life

(and 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 local legislation or treated again with a reducing agent.

Product - unused residue or dry spillage

Pick up dry unused residue or dry spillage as is. Mark the containers. Possibly reuse depending upon shelf life considerations and the requirement to avoid dust exposure. In case of disposal, harden with water and dispose according to "Product – after addition of water, hardened".

Product – slurries

Allow to harden, avoid entry in sewage and drainage systems or into bodies of water (e.g. streams) and dispose of as explained below under "Product - after addition of water, hardened".

Product - after addition of water, hardened

Dispose of according to the local legislation. Avoid entry into the sewage water system. Dispose of the hardened product as concrete waste. Due to the inertisation, concrete waste is not a dangerous waste.

Classification according to 2006/12

Recommended LoW-code: 10 13 14 Waste concrete and concrete sludge.

Recommended LoW-code: 17 01 01 Concrete.

Packaging

Completely empty the packaging and process it according to local legislation.

EWG entry: 15 01 01 (waste paper and cardboard packaging).

SECTION 14: Transport information

Where not otherwise stated the information applies to all of the UN Model Regulations, i.e. ADR (road), RID (railway), ADN (inland waterways), IMDG (sea), and ICAO (IATA) (air).

14.1. UN number

Not classified as dangerous goods

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

Not applicable

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable

14.8 Other transport information

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Cement is a mixture according to REACH and is not subject to registration. Cement clinker is exempt from registration (Art 2.7 (b) and Annex V.10 of REACH).

The marketing and use of cement is subject to a restriction on the content of soluble Cr (VI) (REACH Annex XVII point 47 Chromium VI compounds):

1. Cement and cement-containing mixtures shall not be placed on the market, or used, if they contain, when hydrated, more than 2 mg/kg (0,0002 %) soluble chromium VI of the total dry weight of the cement.
2. If reducing agents are used, then without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of cement or cement-containing mixtures is visibly, legibly and indelibly marked with information on the packing date, as well as on the storage conditions and the storage period appropriate to maintaining the activity of the reducing agent and to keeping the content of soluble chromium VI below the limit indicated in paragraph 1.
3. By way of derogation, paragraphs 1 and 2 shall not apply to the placing on the market for, and use in, controlled closed and totally automated processes in which cement and cement-containing mixtures are handled solely by machines and in which there is no possibility of contact with the skin.

The so-called "Good practice guides" which contain advice on safe handling practices can be found from: <http://www.nepsi.eu/good-practice-guide.aspx>. These good practices have been adopted under the Social Dialogue "Agreement on Workers' Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it by Employee and Employer European sectoral associations, among which CEMBUREAU.

15.2. Chemical safety assessment

Assessment and chemical safety report in accordance with 1907/2006 Annex I has not yet been performed.

SECTION 16: Other information

16a. Indication of where changes have been made to the previous version of the safety data sheet

Revisions of this document

This is the first version

16b. Legend to abbreviations and acronyms used in the safety data sheet

Full texts for Hazard Class and Category Code mentioned in section 3

Skin Irrit 2	Skin Irritant (Category 2)
Eye Dam 1	Irreversible Eye Effects (Category 1)
STOT SE 3resp	Specific target organ toxicity - single exposure; May cause respiratory irritation (Category 3 resp)
Skin Sens 1	May cause an allergic skin reaction (Category 1)

Explanations of the abbreviations in Section 14

ADR	European Agreement concerning the International Transport of Dangerous Goods by Road
RID	Regulations concerning the International Transport of Dangerous Goods by Rail
IMDG	International Maritime Dangerous Goods Code
ICAO	International Civil Aviation Organization (ICAO, 999 University Street, Montreal, Quebec H3C 5H7, Canada)
IATA	The International Air Transport Association

16c. Key literature references and sources for data

Sources for data

Primary data for the calculation of the hazards has preferentially been taken from the official European classification list, 1272/2008 Annex I, as updated to 2018-10-24.

Where such data was not available, alternative documentation used to establish the official classification was used, e.g. IUCLID (International Uniform Chemical Information Database). As a second alternative, information was used from reputable international chemical industries, and as a third alternative other available information was used, e.g. material safety data sheets from other suppliers or information from non-profit associations, where reliability of the source was assessed by expert opinion. If, in spite of this, reliable information could not be sourced, the hazards were assessed by expert opinions based on the known hazards of similar substances, and according to the principles in 1907/2006 and 1272/2008.

Full texts for Regulations mentioned in this Safety Data Sheet

- 1907/2006 REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- 2015/830 COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- 1272/2008 REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
- EH40/2005 EH40/2005 Workplace exposure limits
- 1907/2006 REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

16d. Methods of evaluating information referred to in 1272/2008 Article 9 which was used for the purpose of classification

Hazard calculation for this mixture has been performed as a cumulative assessment with the aid of expert assessments in accordance with 1272/2008 Annex I, where all available information which may be significant to establishing the hazards of the mixture was assessed together, and in accordance with 1907/2006 Annex XI.

16e. List of relevant hazard statements and/or precautionary statements

Full texts for hazard statements mentioned in section 3

- H315 Causes skin irritation
- H318 Causes serious eye damage
- H335 May cause respiratory irritation
- H317 May cause an allergic skin reaction

16f. Advice on any training appropriate for workers to ensure protection of human health and the environment

Warning for misuse

This product can cause severe harm if used improperly. Read and follow the directions of use carefully. At professional use the employer is responsible for the staff being well aware of the risks.

Other relevant information

Other literature references and sources for data not mentioned above:

- (1) Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006. Finns på: <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.
- (10) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.
- (11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.
- (12) Investigation of the cytotoxic and proinflammatory effects of cement dusts in rat alveolar macrophages, Van Berlo et al, *Chem. Res. Toxicol.*, 2009 Sept; 22(9):1548-58.
- (13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.
- (14) Comments on a recommendation from the American Conference of governmental industrial Hygienists to change the threshold limit value for Portland cement, Patrick A. Hessel and John F. Gamble, EpiLung Consulting, June 2008.
- (15) Prospective monitoring of exposure and lung function among cement workers, Interim report of the study after the data collection of Phase I-II 2006-2010, Hilde Notø, Helge Kjuus, Marit Skogstad and Karl-Christian Nordby, National Institute of Occupational Health, Oslo, Norway, March 2010.
- (16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/ebrc/ebrc-mease.php>

Editorial information

This material safety data sheet has been prepared and checked by KemRisk®, KemRisk Sweden AB, Platensgatan 8, SE-582 20 Linköping, Sweden, www.kemrisk.se