

# SAFETY DATA SHEET

## Norcem Portland Cements (CEM I og II, NS-EN 197; Type I/II, ASTM C-150; API 10A Class G)

SDS according to Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex II-EU

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

Date issued 22.06.2009  
Revision date 01.06.2015

#### 1.1. Product identifier

Product name	Norcem Portland Cements (CEM I og II, NS-EN 197; Type I/II, ASTM C-150; API 10A Class G)
Synonyms	Hvit Portland Sement, Norcem Anleggssement, Norcem Brønnsement Norwell, Norcem Industrisement, Norcem SR Sement, Norcem Standardsement, Norcem Standardsement FA, Slemmestad Mursement, Norcem Anleggssement FA, Cementas Anlægningscement, Lavkarbonsement
Article no.	31L000964, 31L000965, 31L000966, 31L000967, 31L000969, 31L000970, 31L000971, 31L000973
GTIN no.	5709328104807, 7047930000154, 7047930000161, 7047930000147, 7047930000093, 7047930000192, 7047930000178, 7047930000208, 7047930000185, 7047930000260, 7047930000246, 7047930000253, 7047930000277, 7047930000284, 7047930000062, 7047930000079, 7047930000116, 7047930000130, 7047930000123, 7047930000086, 7047930000222, 7047930000239, 7047930000215, 7047930000215
NOBB no.	11409737, 26708677, 23400211, 23400229, 23400203, 26979930, 23400252, 23400237, 23400260, 23400245, 23400328, 23400302, 23400310, 23400336, 29010493, 23400179, 23400153, 23400187, 23400195, 23400344, 23400161, 23400286, 23400294, 23400278

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

Use of the substance/preparation	<p>Cements are used in industrial installations to manufacture/formulate hydraulic binders for building and construction work, such as ready-mixed concrete, mortars, renders, grouts, plasters as well as precast concrete.</p> <p>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. The identified uses of cements and cement containing mixtures cover the dry products and the products in a wet suspension (paste).</p>
Relevant identified uses	<p>PROC2 Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3 Use in closed batch process (synthesis or formulation)</p> <p>PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p>

PROC7 Industrial spraying  
 PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities  
 PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities  
 PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
 PROC10 Roller application or brushing  
 PROC11 Non industrial spraying  
 PROC13 Treatment of articles by dipping and pouring  
 PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation  
 PROC19 Hand-mixing with intimate contact and only PPE available.  
 PROC22 Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting  
 PROC26 Handling of solid inorganic substances at ambient temperature

### 1.3. Details of the supplier of the safety data sheet

#### Manufacturer

Company name	NORCEM A.S
Office address	Lilleakerveien 2b
Postal address	Postboks 143 Lilleaker
Postcode	0216
City	OSLO
Country	NORWAY
Tel	+4722878400
Fax	+4722878402
E-mail	jorunn.gundersen@norcem.no
Website	http://www.norcem.no/
Enterprise no.	934949145

#### 1.4. Emergency telephone number

Emergency telephone	Norwegian Poisons Information:+47 22 59 13 00
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## SECTION 2: Hazards identification

### 2.1. Classification of substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	Eye Dam. 1; H318; På basis av testdata. Skin Irrit. 2; H315; På basis av testdata. Skin Sens. 1; H317; Expert judgement STOT SE3; H335; Expert judgement
Substance / mixture hazardous properties	Cement dust may cause irritation of the respiratory system.  When cement reacts with water, for instance when making concrete or mortar, or when the cement becomes damp, a strong alkaline solution is produced. Due to the high alkalinity, wet cement may provoke skin and eye irritation.  It may also cause an allergic reaction in some individuals due to the soluble Cr(VI) content.  Cement is either naturally low in soluble chromium VI or reducing agents have been added to control the levels of sensitising soluble chromium (VI) to below 2 mg/kg (0.0002%) of the total dry weight of the cement ready for use according to legislation specified under Section 15.

### 2.2. Label elements

## Hazard Pictograms (CLP)



Signal word	Danger
Hazard statements	H318 Causes Serious eye damage. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H335 May cause respiratory irritation.
Precautionary statements	P102 Keep out of reach of children. P280 Wear protective gloves/protective clothing/eye protection/face protection. P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. P302 + P352 + P333 + P 313 IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. P261 + P304 + P340 + P312 Avoid breathing dust/fume/gas/mist/vapours/spray. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. P501 Dispose of contents/container in accordance with local regulation.
Supplemental label information	Skin contact with wet cement, fresh concrete or mortar may cause irritation, dermatitis or burns. May cause damage to products made of aluminium or other non-noble metals.

### 2.3. Other hazards

Other hazards	Cement does not meet the criteria for PBT or vPvB in accordance with Annex XIII of REACH (Regulation (EC) No 1907/2006).
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## SECTION 3: Composition/information on ingredients

### 3.2. Mixtures

Substance	Identification	Classification	Contents
Portland Cement Clinker	CAS no.: 65997-15-1 EC no.: 266-043-4	STOT SE3; H335 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317	60 - 98 %
Flue dust, Portland Cement	CAS no.: 68475-76-3 EC no.: 270-659-9 Registration number: 01-2119486767-17-0073	Skin Irrit. 2; H315; Eye Dam. 1; H318; Skin Sens. 1; H317; STOT SE3; H335;	0 < 1 %

Remarks, substance Portland Cement Clinker is exempted from REACH registration.

Substance comments See detailed information in section 16.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

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.
Skin contact	For dry cement, remove and rinse abundantly with water. For wet cement, 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.
Eye contact	Do not rub eyes in order to avoid possible cornea damage as a result of mechanical stress. Remove contact lenses if any. Incline head to injured eye, open the eyelid(s) widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for at least 30 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.
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 anti poison centre.
Recommended personal protective equipment for first aid responders	No personal protective equipment is needed for first aid responders. First aid workers should avoid contact with wet cement or wet cement containing preparations.

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

Delayed symptoms and effects	<p>Eyes: Eye contact with cement (dry or wet) may cause serious and potentially irreversible injuries.</p> <p>Skin: Cement 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 skin contact with wet cement or wet concrete may cause serious burns because they develop without pain being felt (for example when kneeling in wet concrete even when wearing trousers). For more details see Ref. 1 in section 16.</p> <p>Inhalation: Repeated inhalation of dust of common cements over a long period of time increases the risk of developing lung diseases.</p> <p>Environment: Under normal use, common cement is not hazardous to the environment.</p>
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#### 4.3. Indication of any immediate medical attention and special treatment needed

Other Information	When contacting a physician, take this SDS with you.
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### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media	Common cements are not flammable.
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#### 5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards	Cements are non-combustible and non-explosive and will not facilitate or sustain the combustion of other materials.
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#### 5.3. Advice for firefighters

Personal protective equipment	Cement poses no fire-related hazards. No need for special protective equipment for fire fighters.
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### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### 6.1.1. For non-emergency personnel

Personal precautions	Wear protective equipment as described under Section 8 and follow the advice for safe handling and use given under Section 7.
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### 6.1.2. For emergency responders

For emergency responders	Emergency procedures are not required. However, respiratory protection is needed in situations with high dust levels.
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### 6.2. Environmental precautions

Environmental precautionary measures	Do not wash cement down sewage and drainage systems or into bodies of water (e.g. streams).
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### 6.3. Methods and material for containment and cleaning up

Cleaning method	<p>Collect the spillage in a dry state if possible.</p> <p><b>Dry cement</b> Use 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) or equivalent technique) which do not cause airborne dispersion. Never use compressed air. Alternatively, wipe-up the dust by mopping, wet brushing or by using water sprays or hoses (fine mist to avoid that the dust becomes airborne) and remove slurry. If not possible, remove by slurring with water (see wet cement). When wet cleaning or vacuum cleaning is not possible and only dry cleaning with brushes can be done, ensure that the workers wear the appropriate personal protective equipment and prevent dust from spreading. Avoid inhalation of cement and contact with skin. Place spilled materials into a container. Solidify before disposal as described under Section 13.</p> <p><b>Wet cement</b> Clean up wet cement and place in a container. Allow material to dry and solidify before disposal as described under Section 13.</p>
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### 6.4. Reference to other sections

Other instructions	See sections 8 and 13 for more details.
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## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Handling	<p>Follow the recommendations given under Section 8 and the "Good practice guide" referred to in Section 15.1.</p> <p>To clean up dry cement, see Subsection 6.3.</p>
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### Protective Safety Measures

Safety Measures To Prevent fire	Not relevant.
Preventitive 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.
Preventitive Measures to protect the environment	No particular measures
Advice 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. Use protective gloves to avoid skin contact.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage	<p>Bulk cement should be stored in silos that are waterproof, dry (i.e. with internal condensation minimised), clean and protected from contamination.</p> <p>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.</p> <p>Bags should be stacked in a stable manner.</p>
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Special risks and properties	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.
Other Information	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 NS-EN 196-10. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.
Conditions To Avoid	Do not use aluminium containers due to incompatibility of the materials.

### 7.3. Specific end use(s)

Specific use(s)	No additional information for the specific end uses (see section 1.2).
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## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational Exposure limit values

Substance	Identification	Value	TWA Year
Portland Cement Clinker	CAS no.: 65997-15-1 EC no.: 266-043-4	8-hour TWA: 5resp/10tot mg/m3	

Other Information about threshold limit values	The DNEL refers to respirable dust. In contrast, the tool used for the risk assessment (MEASE) works with the inhalable fraction. Therefore, an additional safety margin is inherently included in the outcome of the assessment and the derived risk management measures. For workers, no DNEL for dermal exposure are available, neither from human hazard studies nor from human experience. Since cements are classified as irritating to skin and eyes, dermal exposure has to be minimised as far as technically feasible.
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#### DNEL / PNEC

Method of testing	Contents
DNEL	Exposure route: Oral Value: not relevant
DNEL	Exposure route: Dermal Value: not applicable
DNEL	Exposure route: Inhalation Exposure frequency: Long term (repeated) Value: 5 mg/m3
PNEC	Exposure route: Soil Value: not applicable
PNEC	Exposure route: Sediment Value: not applicable
PNEC	Exposure route: Water Value: not applicable
Summary of risk management measures, environment	The risk assessment of the environmental compartments is based on the resulting pH impact on water. Possible pH changes in surface water, ground water and STP effluent should not increase the value 9.

### 8.2. Exposure controls

Limitation of exposure on workplace

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.

**Safety signs**



**Precautionary measures to prevent exposure**

Technical measures to prevent exposure

Exposure: Duration is not restricted (up to 480 minutes per shift, 5 shifts a week).

Use: Industrial manufacture/formulation of hydraulic building and construction materials.

1. PROC 2 or 3. Localised controls not required. Respiratory protective equipment not required.
2. PROC 14 or 26. Localised controls not required (use P1 mask with APF=4) or generic local exhaust ventilation with 78 % efficiency (respiratory protective equipment not required).
3. PROC 5, 8b or 9. Either localised control not required (use P2 mask with APF=10) or generic local exhaust ventilation with 82 % efficiency (respiratory protective equipment not required).

Use: Industrial uses of dry hydraulic building and construction materials (indoor, outdoor).

1. PROC 2. Localised controls not required. Respiratory protective equipment not required.
2. PROC 14, 22 or 26. Localised controls not required (use P1 mask with APF=4) or generic local exhaust ventilation with 78 % efficiency (respiratory protective equipment not required).
3. PROC 5, 8b, 9. Either general ventilation with 17 % efficiency (use P2 mask with APF=10) or generic local exhaust ventilation with 82 % efficiency (respiratory protective equipment not required).

Use: Industrial uses of wet suspension of hydraulic building and construction materials.

1. PROC 7. Localised controls not required (use P2 mask with APF=10) or generic local exhaust ventilation with 78 % efficiency (respiratory protective equipment not required).
2. PROC 2, 5, 8b, 9, 10, 13 or 14. Localised controls not required. Respiratory protective equipment not required.

Use: Professional use of dry hydraulic building and construction material (indoor, outdoor).

1. PROC 2. Either localised controls not required (use P1 mask with APF=4) or general ventilation with 29 % efficiency (respiratory equipment not required).



2. PROC 9 or 26. Localised controls not required (use P2 mask with APF=10) or generic local exhaust ventilation with 77 % efficiency (respiratory protective equipment not required).
3. PROC 5, 8a, 8b or 14. Localised controls not required (use P3 mask with APF=20) or generic local exhaust ventilation with 72 % efficiency (use P1 mask with APF=4).
4. PROC 19. Localised controls are not applicable, process only in good ventilated rooms or outdoor. Efficiency 50 %. Use P2 mask with APF=10.

Use: Professional uses of wet suspensions of hydraulic building and construction materials.

1. PROC 11. Localised controls not required (use P2 mask with APF=10) or generic local exhaust ventilation with 77 % efficiency (respiratory protective equipment not required).
2. PROC 2, 5, 8a, 8b, 9, 10, 13, 14, 19. Localised controls not required. Respiratory protective equipment not required.

## Respiratory protection

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 NS-EN standard. Minimum P2-filter is recommended.

Recommended type of equipment

Depending of ventilation and use; see Technical measures to prevent exposure.

Reference to relevant standard

NS-EN 149, NS-EN 140, NS-EN 14387, NS-EN 1827.

## Hand protection

Hand protection

Use impervious, abrasion and alkali resistant gloves (made of low soluble Cr (VI) containing material) internally lined with cotton. Protective gloves to be used must comply with the specifications of EU Directive 89/686/EEC and the standard NS-EN 374. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.

## Eye / face protection

Eye protection

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

## Skin protection

Skin protection (except hands)

Use boots, closed long-sleeved protective clothing as well as skin care products (including 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.

In some circumstances, such as when laying concrete or screed, waterproof trousers or kneepads are necessary.

## Thermal hazards

Thermal hazards

Not applicable.

## Appropriate environmental exposure control

Environmental exposure controls

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

Environmental exposure control is relevant for the aquatic environment as emissions of cements in the different life-cycle stages (production and use) mainly apply to ground and waste water. The aquatic effect and risk assessment cover the effect on organisms/ecosystems due to possible pH changes related to hydroxide discharges. The toxicity of other dissolved



inorganic ions is expected to be negligible compared to the potential pH effect.

Any effects that might occur during production and use would be expected to take place on a local scale. The pH of effluent and surface water should not exceed 9. Otherwise it could have an impact on municipal sewage treatment plants (STPs) and industrial waste water treatment plants (WWTPs). For that assessment of the exposure, a stepwise approach is recommended:

Tier 1: Retrieve information on effluent pH and the contribution of the cement on the resulting pH. Should the pH be above 9 and be predominantly attributable to cement, then further actions are required to demonstrate safe use.

Tier 2: Retrieve information on receiving water pH after the discharge point. The pH of the receiving water shall not exceed the value of 9.

Tier 3: Measure the pH in the receiving water after the discharge point. If pH is below 9, safe use is reasonably demonstrated. If pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thus ensuring safe use of cement during production or use phase.

No special emission control measures are necessary for the exposure to the terrestrial environment.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	Powder
Colour	Grey
Odour	Odourless
pH (aqueous solution)	Value: 11-13,5
Comments, pH (aqueous solution)	T = 20°C in water, water-solid ratio 1:2
Melting point/melting range	Value: > 1250 °C
Comments, Boiling point / boiling range	Not applicable as under normal atmospheric conditions, melting point >1 250°C
Comments, Flash point	Not applicable as not a liquid
Comments, Evaporation rate	Not applicable as not a liquid
Comments, Explosion limit	Not relevant.
Comments, Vapour pressure	Not relevant.
Comments, Vapour density	Not relevant.
Comments, Specific gravity	Relative density: 2.75-3.20; Apparent density: 0.9-1.5 g/cm <sup>3</sup>
Solubility in water	0,1-1,5 g/L (T=20°C)
Comments, Partition coefficient: n-octanol / water	Not relevant.
Comments, Spontaneous combustability	Not relevant.
Comments, Decomposition temperature	Not relevant.
Comments, Viscosity	Not applicable as not a liquid
Oxidising properties	Not relevant.

### 9.2. Other information

#### Physical hazards

Particle size	Value: 5-30 um
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

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

### 10.2. Chemical stability

**Stability** Dry cements are stable as long as they are properly stored (see Section 7) and compatible with most other building materials. They should be kept dry.

Contact with incompatible materials should be avoided.

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

### 10.3. Possibility of hazardous reactions

**Possibility of hazardous reactions** Cements do not cause hazardous reactions

### 10.4. Conditions to avoid

**Conditions to avoid** Humid conditions during storage may cause lump formation and loss of product quality.

### 10.5. Incompatible materials

**Materials to avoid** Acids, ammonium salts, aluminium or other non-noble metals. Uncontrolled use of aluminium powder in wet cement should be avoided as hydrogen is produced.

### 10.6. Hazardous decomposition products

**Hazardous decomposition products** Cements will not decompose into any hazardous products.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Other information regarding health hazards

**General** Apart from skin sensitisation, Portland cement clinker and common cements have the same toxicological and eco-toxicological properties.

#### Acute toxicity, Mixture estimate

**Oral** 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.

Reference: Literature survey

**Dermal** Limit test, rabbit, 24 hours contact, 2,000 mg/kg body weight – no lethality. Based on available data, the classification criteria are not met. See ref. 2.

**Inhalation of dust and mist** No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met. See ref. 9.

#### Potential acute effects

**Inhalation** 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.

**Skin contact** Skin corrosion/irritation cat 2:  
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. Reference: Human experience and ref. 2.

**Eye contact** Serious eye damage/irritation-cat 1:  
Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128.

	<p>Common cements contain varying quantities of Portland cement clinker, fly ash, blast furnace slag, gypsum, natural pozzolans, burnt shale, silica fume and limestone.</p> <p>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. See ref. 10 and 11.</p>
Ingestion	Irritation of the digestive system may occur if you swallow large amounts of cement.
Aspiration hazard	Not applicable

### Delayed effects / repeated exposure

Sensitisation	<p>Skin sensitisation-Cat 1:</p> <p>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.</p> <p>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.</p> <p>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 [Reference (3)]. See ref. 3 and 4.</p> <p>Respiratory sensitisation:</p> <p>There is no indication of sensitisation of the respiratory system.</p> <p>Based on available data, the classification criteria are not met. See ref. 1.</p>
STOT-single exposure	<p>Cat. 3. 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.</p> <p>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. See ref. 1.</p>
STOT-repeated exposure	<p>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.</p> <p>Based on available data, the classification criteria are not met. See ref. 15.</p>

### Carcinogenic, Mutagenic or Reprotoxic

Carcinogenicity	<p>No causal association has been established between Portland cement exposure and cancer. The epidemiological literature does not support the designation of Portland cement as a suspected human carcinogen.</p> <p>Portland cement is not classifiable as a human carcinogen (According to ACGIH A4: Agents that cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity that are sufficient to classify the agent with one of the other notations.).</p> <p>Based on available data, the classification criteria are not met. See ref. 1 and 14.</p>
Mutagenicity	<p>No indication.</p> <p>Based on available data, the classification criteria are not met. See ref. 12 and 13.</p>
Reproductive toxicity	<p>Based on available data, the classification criteria are not met. Reference: No evidence from human experience.</p>

## Symptoms of Exposure

Other Information	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.
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## SECTION 12: Ecological information

### 12.1. Toxicity

Ecotoxicity	The product is not hazardous to the environment. Ecotoxicological tests with Portland cement on <i>Daphnia magna</i> [Reference (5)] and <i>Selenastrum coli</i> [Reference (6)] have shown little toxicological impact. Therefore LC50 and EC50 values could not be determined [Reference (7)]. There is no indication of sediment phase toxicity [Reference (8)]. The addition of large amounts of cement to water may, however, cause a rise in pH and may, therefore, be toxic to aquatic life under certain circumstances.
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### 12.2. Persistence and degradability

Persistence and degradability	Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks
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### 12.3. Bioaccumulative potential

Bioaccumulative potential	Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks
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### 12.4. Mobility in soil

Mobility	Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks
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### 12.5. Results of PBT and vPvB assessment

PBT assessment results	Not relevant as cement is an inorganic material. After hardening, cement presents no toxicity risks
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### 12.6. Other adverse effects

Other adverse effects / Remarks	Not relevant.
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## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Specify the appropriate methods of disposal	<p>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.</p> <p>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"</p> <p>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".</p> <p>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</p>
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	the inertisation, concrete waste is not a dangerous waste.
Relevant waste regulation	To be disposed of according to FOR 2004-06-01 nr 930: Norwegian Regulations concerning recycling and treatment of waste. The given EWC-code(s) are guidelines only. The end user has to chose the correct code(s) based on the actual use of the product.
Hazardous waste product	Dry cement powder are hazardous waste. Harden with water before disposal.
Packaging classified as hazardous waste	No
EWC waste code	EWC: 101314 waste concrete and concrete sludge EWC: 170101 concrete
EWL Packing	Completely empty the packaging and process it according to local legislation. EWC entry: 15 01 01 (waste paper and cardboard packaging).
Other Information	Do not dispose of into sewage systems or surface waters.

## SECTION 14: Transport information

### 14.1. UN number

Comments Not relevant.

### 14.2. UN proper shipping name

Comments Not relevant.

### 14.3. Transport hazard class(es)

Comments Not relevant.

### 14.4. Packing group

Comments Not relevant.

### 14.5. Environmental hazards

Comments Not relevant.

### 14.6. Special precautions for user

Special safety precautions for user Not relevant.

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category Not relevant.

### Additional information.

Additional information. Cement is not covered by the international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID), therefore no classification is required.  
No special precautions are needed apart from those mentioned under Section 8.

## SECTION 15: Regulatory information

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

References (laws/regulations) FOR 2012-06-16 nr 622: Norwegian Regulations for classification and labelling of substances and mixtures (CLP).  
FOR 2008-05-30 nr 516: Norwegian REACH regulation.  
REACH (Regulation (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006)  
FOR 2004-06-01 nr 930: Norwegian Regulations concerning recycling and treatment of waste, as amended.  
International Transport Regulation: ADR/RID, IMDG, IATA.  
FOR 2011-12-06: Norwegian regulations concerning performing work.  
FOR 2011-12-06 nr. 1358 Norwegian Occupational Exposure Limits  
Annex VI to Regulation (EC) No 1272/2008 includes lists of harmonised

	<p>classification and labelling <a href="http://www.ecb.jrc.ec.europa.eu/classification-labelling/clp/">www/ecb.jrc.ec.europa.eu/classification-labelling/clp/</a>).                  COMMISSION REGULATION (EU) No 453/2010 of 20 May 2010, amending Regulation (EC) No 1907/2006 REACH.</p>
Comments	<p>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).</p> <p>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):</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol> <p>The so-called "Good practice guides" which contain advice on safe handling practices can be found from: <a href="http://www.nepsi.eu/good-practice-guide.aspx">http://www.nepsi.eu/good-practice-guide.aspx</a>. 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.</p>

## 15.2. Chemical safety assessment

### SECTION 16: Other information

Supplier's notes	<p>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.</p> <p>It is implicit that the user is responsible for determining appropriate safety measures and for applying the legislation covering his/her own activities.</p>
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	<p>Skin Irrit. 2; H315; On basis of test data                  Skin Sens. 1; H317; Expert opinion                  Eye Dam. 1; H318; On basis of test data                  STOT SE3; H335; Expert opinion</p>
List of relevant H-phrases (Section 2 and 3).	<p>H318 Causes Serious eye damage.                  H315 Causes skin irritation.                  H335 May cause respiratory irritation.                  H317 May cause an allergic skin reaction.</p>
Training advice	<p>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 SDS.</p>
Abbreviations and acronyms used	<p>ACGIH American Conference of Industrial Hygienists</p>

ADR/RID European Agreements on the transport of Dangerous goods by Road/Railway  
 APF Assigned protection factor  
 CAS Chemical Abstracts Service  
 CLP Classification, labelling and packaging (Regulation (EC) No 1272/2008)  
 COPD Chronic Obstructive Pulmonary Disease  
 DNEL Derived no-effect level  
 EC50 Half maximal effective concentration  
 ECHA European Chemicals Agency  
 EINECS European INventory of Existing Commercial chemical Substances  
 EPA Type of high efficiency air filter  
 ES Exposure scenario  
 EWC European Waste Catalogue  
 FF P Filtering facepiece against particles (disposable)  
 FM P Filtering mask against particles with filter cartridge  
 GefStoffV Gefahrstoffverordnung  
 HEPA Type of high efficiency air filter  
 H&S Health and Safety  
 IATA International Air Transport Association  
 IMDG International agreement on the Maritime transport of Dangerous Goods  
 LC50 Median lethal dose  
 MEASE Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <http://www.ebrc.de/ebrc/ebrc-mease.php>  
 MS Member State  
 OELV Occupational exposure limit value  
 PBT Persistent, bio-accumulative and toxic  
 PNEC Predicted no-effect concentration  
 PROC Process category  
 RE Repeated exposure  
 REACH Registration, Evaluation and Authorisation of Chemicals  
 RPE Respiratory protective equipment  
 SCOEL Scientific Committee on Occupational Exposure Limit Values  
 SDS Safety Data Sheet  
 SE Single exposure  
 STP Sewage treatment plant  
 STOT Specific Target Organ Toxicity  
 TLV-TWA Threshold Limit Value-Time-Weighted Average  
 TRGS Technische Regeln für Gefahrstoffe  
 VLE-MP Exposure limit value-weighted average in mg by cubic meter of air  
 vPvB Very persistent, very bio-accumulative  
 w/w Weight by weight  
 WWTP Waste water treatment plant

Additional information

Cement in dry state consists mainly of: 3CaO-SiO<sub>2</sub>, 2 CaO-SiO<sub>2</sub>, 3CaO-Al<sub>2</sub>O<sub>3</sub>, 4CaO-Al<sub>2</sub>O<sub>3</sub>-Fe<sub>2</sub>O<sub>3</sub>, CaSO<sub>4</sub> and MgO. There are also small amounts of alkalis, lime and chlorides together with traces of chromium compounds. Other metals will also be present as trace elements. When cement is mixed with water and while it is in plastic state before curing, some components pose a health hazard:

- a) Lime, calcium silicates and alkalis in the cement is water soluble and when these are mixed with water a corrosive alkaline solution is formed.
- b) Hexavalent chromium salts in the cement are soluble and can be mixed with water forming a hazardous solution. Upon the addition of iron sulfate for reduction from 6- to 3-valent chromium, this health risk is significantly reduced. This cement is added iron sulfate. Reduction is effective for 6 months after packing date, if the cement is stored dry.



	<p>Hazards do not apply to dry cement, only when it occurs in moist or wet environment.</p> <p>CEM II cements can contain up to 30 % fly ash. Fly ash may contain respirable quartz, but &lt; 2%.</p>
Important data sources used to construct the safety data sheet	<p>The Safety Data Sheet has been prepared using a template and information from the European cement industry's trade association Cembureau (<a href="http://www.cembureau.eu">www.cembureau.eu</a>), 15.12.2014.</p> <p>(1) Portland Cement Dust - Hazard assessment document EH75/7, UK Health and Safety Executive, 2006. Available from: <a href="http://www.hse.gov.uk/pubns/web/portlandcement.pdf">http://www.hse.gov.uk/pubns/web/portlandcement.pdf</a>.</p> <p>(2) Observations on the effects of skin irritation caused by cement, Kietzman et al, <i>Dermatosen</i>, 47, 5, 184-189 (1999).</p> <p>(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). <a href="http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf">http://ec.europa.eu/health/archive/ph_risk/committees/sct/documents/out158_en.pdf</a>.</p> <p>(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.</p> <p>(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).</p> <p>(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).</p> <p>(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.</p> <p>(8) Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.</p> <p>(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.</p> <p>(10) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.</p> <p>(11) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.</p>

	<p>(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.</p> <p>(13) Cytotoxicity and genotoxicity of cement dusts in A549 human epithelial lung cells in vitro; Gminski et al, Abstract DGPT conference Mainz, 2008.</p> <p>(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.</p> <p>(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.</p> <p>(16) MEASE, Metals estimation and assessment of substance exposure, EBRC Consulting GmbH for Eurometaux, <a href="http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php">http://www.ebrc.de/industrial-chemicals-reach/projects-and-references/mease.php</a>.</p> <p>(17) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kåre Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.</p>
Information which has been added, deleted or revised	This safety data sheet applies to all Norcems cement qualities, and replaces the previous safety data sheets for the individual qualities. Replaces earlier versions of the safety data sheet. Safety Data Sheet has been revised to meet the requirements acc. Commission Regulation (EC) No 453/2010.
Version	2
Responsible for safety data sheet	NORCEM A.S