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

1.1 Product identifier

Cements according to NEN EN 197 of all strength classes (32.5, 42.5 and 52.5):
- CEM I Portland cements
- CEM II Portland-composite cements
- CEM III Blast furnace cements
- CEM V Composite cements

Masonry cement according to NEN EN 413 MC of all strength classes (5, 12.5 and 22.5)

Substances which present a health or environmental hazard (see also Section 3.1.1)

- Portland cement clinker
- Flue dust from production of Portland cement clinker

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

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.

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). See section 16.2 for more information regarding use descriptors and categories.

Any uses not mentioned above, are advised against.

Identified uses for professionals including process categories and descriptors according to ECHA Guidance R.12 (ECHA-2010-G-05) are listed in Section 16.

1.3. Details of the supplier of the Safety Data Sheet

Company name:	ENCI B.V.
Full address:	Pettelaarpark 30 5216 PD `s-Hertogenbosch PO Box 3233, NL 5203 DE `s Hertogenbosch
Telephone:	+31 (0) 73 640 1180

Technical Advise Department: : +31 (0) 73 640 1220
E-mail address of the person responsible for the SDS: REACH-info@enci.nl

Production locations:	ENCI B.V. Vestiging Maastricht ENCI B.V. Vestiging Rotterdam ENCI B.V. Vestiging IJmuiden

1.4. Emergency telephone number

Emergency telephone number in the Netherlands +31 (0) 30 274 8888
National Poisons Information Centre
https://www.vergiftigingen.info
Hours of operation: 24h/7 days
Information provided will be limited to professionals
For other countries, contact a Poisons Information Centre: http://apps.who.int/poisoncentres

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]

Hazard class	Hazard category	Hazard statements
Skin irritation	2	H315: Causes skin irritation
Serious eye damage/eye irritation	1	H318: Causes serious eye damage
Skin sensitisation	1B	H317: May cause an allergic skin reaction
Specific target organ toxicity single exposure respiratory tract irritation	3	H335: May cause respiratory irritation

2.2. Label elements

2.2.1 Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms:	
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. P305+P351+P338 + 310: 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+P313: IF ON SKIN: Wash with plenty of soap and water. If skin iirritation or rash occurs: Get medical advice/attention.

	P261 + P304+ P340 + P312: Avoid breathing dust. 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 to suitable waste collection
Supplementary 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

Cement does not meet the criteria for PBT or vPvB in accordance with Annex XIII of the REACH Regulation (EC) No 1907/2006.

SECTION 3: Composition/information on ingredients

3.1. Substances

For the cements mentioned under 1,1 the following constituents are used:

Constituent	CAS Number	Classification according to (EC) No. 1272/2008 (CLP)	
Portland Cement clinker	65997 - 15 - 1	Skin irritation, 2 Skin sensitisation, 1B Serious eye damage/eye irritation, 1 STOT SE, 3	H315 1) H317 H318 H335
Blast furnace slag	65996 - 69 - 2	none	none
Fly ash	68131 - 74 - 8	None	none
Lime stone	1317 - 65 - 3	None	none
Gypsum	10101 - 41 - 4	None	none
Anhydrite	7778 - 18 - 9	None	none
Flue Dust	68475 - 76 - 3	Skin irritation, 2 Skin sensitisation, 1B Serious eye damage/eye irritation, 1 STOT SE, 3	H315 1) H317 H318 H335

1) The term "irritation" is not applicable to the dry powder product, but to the product into contact with moisture and water. It may cause skin irritation or severe burns.

3.1.1 Substances which present a health or environmental hazard :

Substance	Portland cement clinker	Flue dust from production of Portland cement clinker
EC number	266-043-4	270-659-9
CAS number	65997-15-1	68475-76-3
Registration number	exempted (see 15.1)	01-211948-6767-17-0042
Concentration range [wt.-%]	5 – 100	0,1 – 5
Classification according to European Regulation (EC) No 1272/2008	Hazard, cat 1 H315, H317, H318, H335	Hazard, cat 1 H315, H317, H318, H335

		

3.2. Mixtures

The table below shows the content of Portland cement clinker and flue dust in the various cements. The specified percentages are expressed relative to the sum of the primary and secondary components of the cement. The gypsum and /or anhydrite, which represents approximately 5%, is not included in that sum.

Cement type	Content of Portland cement clinker in%	Content of Flue Dust in %
CEM I	95 – 100	0 – 5
CEM II	65 – 94	0 – 5
CEM III	5 – 64	0 – 5
CEM V	20 – 64	0 – 5
MC	≥ 25	0 – 5

SECTION 4: First aid measures

4.1. Description of first aid measures

General notes
No special personal protective equipment is required for first aid responders. First aiders should, however, avoid contact with wet cement or wet cement containing mixtures

Following eye contact
Do not rub eyes, because mechanical stress may cause additional damage to the cornea. Where applicable, remove contact lenses and immediately rinse the eye, while open, under running water for at least 20 minutes in order to remove all particles. If possible, use isotonic eye-cleansing solution (0.9 % NaCl). Always consult an occupational physician or ophthalmologist.

Following skin contact
Remove dry cement and rinse abundantly with water. Rinse wet cement agent with plenty of water. Remove contaminated clothing, footwear, watches, etc. and clean these thoroughly before re-using them. Seek medical treatment in all cases of irritation or burns.

Following inhalation
Move the person to fresh air. Dust should quickly be removed from throat and nose. Consult a physician, should symptoms such as discomfort, coughing or persistent irritation occur.

Following 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 National Poison Information Centre.

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

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

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 Reference (1).

Inhalation : Repeated inhalation of dust of Common cements over a long period of time increases the risk of developing lung diseases.

Environment : Under normal use, Common cement is not hazardous to the environment.

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

When contacting a physician, take this safety data sheet with you.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Common cement are not flammable.

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 firefighters

No special measures are required, as cements do not pose any fire-related hazards.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear protective equipment as described in Section 8. Follow the advice for safe handling and use given in Section 7.

6.1.2 For emergency responders

Emergency action plans are not required.
However, respiratory protection is needed in situations with high dust levels.

6.2. Environmental precautions

Cements should not penetrate the sewage water system, surface water or groundwater.

6.3. Methods and material for containment and cleaning up

Collect the spillage in a dry state if possible.

Dry cement
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 slurrying 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.

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

6.4. Reference to other sections

See Sections 8 and 13 for further details.

SECTION 7: Handling and storage

Do not handle or store near food and beverages or smoking materials.

7.1. Precautions for safe handling

7.1.1 Protective measures

Follow the recommendations as given in Section 8.
To clean up dry cement, see Subsection 6.3.

Measures to prevent fire
Not applicable.

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.
For more information, refer to the practice guidelines 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. These safe handling practices can be found via the following link: http://www.nepsi.eu/good-practice-guide

Measures to protect the environment
No special measures required.

7.1.2 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

Bulk cement should be stored under dry (minimizing internal condensation), water-protected conditions, 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 use(s)

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. They will also indicate the appropriate storage conditions for maintaining the effectiveness of the reducing agent.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Maximum Allowable	Exposure	Frequency of exposure	Source
Portland cement (dust): 10 mg/m^3	Inhalation	TCG - 8 hours	Nationale MAC-lijst 2007 *) (reference 2 and 18)
Water-soluble Chromium(VI): 2 ppm	Skin	short period (acute) Long time (repeatedly)	Regulation (EC) No 1907/2006

* From January 1, 2007 The Nationale MAC-Lijst is replaced by the list Wettelijke Nederlandse Grenswaarden, part of the law "Arbeidsomstandighedenregeling" (reference 2 and 18). In this list, Portland cement (dust) is no longer mentioned.

8.2. Exposure controls

For each individual PROC, users can choose from either option A) or B) in the table from section 8.2.1, according to what is best suited to their specific situation. If one option is chosen, then the same option has to be chosen in the table from section "8.2.2 Individual protection measures such as personal protection equipment" - Specification of respiratory protective equipment. Only combinations between A) - A) and B) - B) are possible.

8.2.1 Appropriate engineering controls

Measures to reduce generation of dust and to avoid dust propagating in the environment such as dedusting, exhaust ventilation and dry clean-up methods which do not cause airborne dispersion.

Use	PROC*	Exposure	Localised controls	Efficiency
Industrial manufacturing / formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts per week).	not required	-
	14, 26		A) not required or B) generic local exhaust ventilation	- 78%
	5, 8b, 9		A) general ventilation or B) generic local exhaust ventilation	17% 78%
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) not required or B) generic local exhaust ventilation	- 78%
	5, 8b, 9		A) general ventilation or B) generic local exhaust ventilation	17%
Industrial uses of wet suspensions of hydraulic building and construction materials (indoor, outdoor)	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) not required or B) generic local exhaust ventilation	- 78%
Professional uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	9, 26		A) not required or B) generic local exhaust ventilation	- 72%
	5, 8a, 8b, 14		A) not required or B) integrated local exhaust ventilation	- 87%
	19		localised controls are not applicable, process only in good ventilated rooms or outdoor	-
Professional uses of wet suspensions of hydraulic building and construction materials (indoor, outdoor)	11		A) not required or B) local exhaust ventilation	- 72%
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

8.2.2 Individual protection measures, such as personal protective equipment

General

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 (e.g. nitrile soaked cotton gloves with CE marking) internally lined with cotton; boots; closed long-sleeved protective clothing as well as skin care products (e.g. 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 (EN 149) or national standard.

Thermal hazards

Not applicable.

Use	PROC*	Exposure	Specification of respiratory protective equipment (RPE)	RPE efficiency – assigned protection factor (APF)
Industrial manufacturing/formulation of hydraulic building and construction materials	2, 3	Duration is not restricted (up to 480 minutes per shift, 5 shifts per week).	not required	-
	14, 26		A) FFP1 mask or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 mask or B) FFP1 mask	APF = 10 APF = 4
Industrial uses of dry hydraulic building and construction materials (indoor, outdoor)	2		not required	-
	14, 22, 26		A) FFP1 mask or B) not required	APF = 4 -
	5, 8b, 9		A) FFP2 mask or B) FFP1 mask	APF = 10 APF = 4
Industrial uses of wet suspensions of hydraulic building and construction materials (indoor, outdoor)	2, 5, 8b, 9, 10, 13, 14		not required	-
	7		A) FFP1 mask or B) not required	APF = 4 -
Professional uses of dry hydraulic building and construction materials (indoor, outdoor)	2		FFP1 mask	APF = 4
	9, 26		A) FFP2 mask or B) FFP1 mask	APF = 10 APF = 4
	5, 8a, 8b, 14		A) FFP3 mask or B) FFP1 mask	APF = 20 APF = 4
	19		FFP2 mask	APF = 10
Professional uses of wet suspensions of hydraulic building and construction materials (indoor, outdoor)	11		A) FFP1 mask or B) not required	APF = 4 -
	2, 5, 8a, 8b, 9, 10, 13, 14, 19		not required	-

* PROC's are identified uses and defined in section 16.2.

[For each individual PROC, *users must choose option A) or B) in the table above, according to what was chosen in section "8.2.1 Appropriate engineering controls" -localised controls*.]

An overview of the APFs of different RPE (according to EN 529:2005) can be found in the glossary of MEASE (4)

8.2.3 Environmental exposure controls

Air: Compliance with dust emission limit values in accordance with the Technical Instructions on Air Quality.

Water: Do not wash cement into sewage systems or into bodies of water, to avoid high pH. Above pH 9 negative ecotoxicological impacts are possible.

Soil and terrestrial environment: 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

(a) Appearance: Dry cement is a finely ground inorganic solid material (grey or white powder) Main particle size: 5-30 µm
(b) Odor: Odorless
(c) Odor threshold: No odor threshold, odorless
(d) pH (T = 20 °C in water, water-solid ratio 1:2): 11-13.5
(e) Melting point / freezing point: > 1250 °C
(f) Initial boiling point and boiling range: Not applicable, as under normal atmospheric conditions the melting point is above 1250 °C.
(g) Flash point: Not applicable, as is not a liquid
(h) Evaporation rate: Not applicable, as is not a liquid
(i) Flammability (solid, gas): Not applicable, as it is a solid is non combustible and does not cause or contribute to fire through friction
(j) Upper/lower flammability or explosive limits: Not applicable, as it is not a flammable gas
(k) Vapor pressure: Not applicable, as melting point > 1250 °C
(l) Vapor density: Not applicable, as melting point > 1250 °C
(m) Relative density: 2.75-3.20 g/cm³; bulk density: 0.9-1.5 g/cm³
(n) Solubility(ies) in water (T = 20 °C): slight (0.1-1.5 g/L)
(o) Partition coefficient: n-octanol/water: Not applicable, as it is an inorganic mixture
(p) Auto-ignition temperature: Not applicable (not pyrophoric – no organo-metallic, organo-metalloid or organo-phosphine bindings or of their derivatives, and no other pyrophoric constituents in the composition)
(q) Decomposition temperature: Not applicable, as no inorganic peroxides are present
(r) Viscosity: Not applicable, as it is no liquid
(s) Explosive properties: Not applicable. Not explosive or pyrotechnic. Not in itself capable by chemical reaction of producing gas at such temperature and pressure and at such a speed as to cause damage to the surroundings. Not capable of a self-sustaining exothermic chemical reaction.
(t) Oxidizing properties: Not applicable, as does not cause or contribute to the combustion of other materials.

9.2. Other information

Not applicable.

SECTION 10: Stability and Reactivity

10.1. Reactivity

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

10.2. Chemical 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 aluminum or other non-noble metals. Cement dissolves in hydrofluoric acid to produce corrosive silicon tetrafluoride gas. Cement reacts with water to form calcium silicate hydrates, calcium aluminate hydrates 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

Cements do not cause hazardous reactions.

10.4. Conditions to avoid

Humid conditions during storage may cause lump formation and loss of product quality.

10.5. Incompatible materials

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

10.6. Hazardous decomposition products

Cement will not decompose into any hazardous products.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Hazard Class	Cat.	Effect	Reference
Acute toxicity – dermal	-	Limit test, rabbit, 24 hour exposure, 2,000 mg/kg body weight – no lethality Based on available data, the classification criteria are not fulfilled.	(5)
Acute toxicity – inhalation	-	No acute toxicity by inhalation observed. Based on available data, the classification criteria are not met.	(11)
Acute toxicity – oral	-	No indication of oral toxicity from studies with cement kiln dust. Based on available data, the classification criteria are not met	Literature survey
Skin corrosion/ irritation	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.	(5) and human experience

Serious eye damage/irritation	1	Portland cement clinker caused a mixed picture of corneal effects and the calculated irritation index was 128. Common cements contain varying quantities of Portland cement clinker, fly ash, blast furnace slag, gypsum, natural pozzolans, burnt shale, silica fume and limestone. 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.	(13), (14) and human experience
Skin sensitization	1B	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 [Reference (6)].	(6),(7),(21)
Respiratory sensitization	-	There is no indication of respiratory sensitization. Based on available data, the classification criteria are not met.	(1)
Germ cell mutagenicity	-	No indication. Based on available data, the classification criteria are not met.	(16), (17)
Carcinogenicity	-	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. 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.). Based on available data, the classification criteria are not met.	(1) (18)
Reproductive toxicity	-	Based on available data, the classification criteria are not met.	No evidence from human experience.
STOT – single exposure	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. 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.	(1)

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. Based on available data, the classification criteria are not met.	(20)
Aspiration hazard	-	Not applicable, as cements are not used as an aerosol.	

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

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.

SECTION 12: Ecological information

12.1. Toxicity

The product is not hazardous to the environment. Ecotoxicologcal tests with Portland cement on Daphnia magna [Reference (8)] and Selenastrum coli [Reference (9)] have shown little toxicological impact. Therefore LC50 and EC50 values could not be determined [Reference (10)]. There is no indication of sediment phase toxicity [Reference (11)]. 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.

12.2. Persistence and degradability

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

12.3. Bioaccumulative potential

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

12.4. Mobility in soil

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

12.5. Results of PBT and vPvB assessment

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

12.6. Other adverse effects

Not relevant.

SECTION 13: Disposal considerations

Do not dispose of into sewage systems or surface waters.

13.1. Waste treatment methods

Product - cement that has exceeded its shelf life
EWC entry: 1 0 13 99 (wastes not otherwise specified) (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
EWC entry: 10 13 06 (Other particulates and dust)
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.
EWC entries: 10 13 14 (waste from manufacturing of cement – waste concrete or concrete sludge) or 17 01 01 (construction and demolition wastes – concrete)

Packaging
Completely empty packaging and process it according to local legislation.
EWC entry: 15 01 01 (waste paper and cardboard packaging)

SECTION 14: Transport information

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

14.1. UN number

Not relevant.

14.2. UN proper shipping name

Not relevant.

14.3. Transport hazard class(es)

Not relevant.

14.4. Packing group

Not relevant.

14.5. Environmental hazards

Not relevant.

14.6. Special precautions for user

Not relevant.

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

Not relevant.

SECTION 15: Regulatory information

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

EU regulatory information
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).

Restrictions on use:

According to Annex XVII Paragraph 47 of EC Regulation 1907/2006 (REACH), the marketing and use of cements and cement-containing preparations is subject to restriction:
1. Cement and cement-containing mixtures shall not be used or placed on the market if they contain, when hydrated, more than 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 labeling of dangerous substances and mixtures, suppliers shall ensure, before placing on the market, that the labeling of cement and cement-containing mixtures is clearly readable and durably indicating when the product was packaged and under what conditions and for how long it can be stored without the effect of the reducing agent decreasing and the content of soluble Chromium(VI) exceeding the limit value specified in Number 1.
3. By way of derogation, Numbers 1 and 2 shall not apply to the placing on the market with regard to well- controlled, closed and fully automated processes, and to use in 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.
4. The standard, which has been adopted by the European Committee for Standardization (CEN) for the determination of the content of water-soluble Chromium(VI) of cement and cement-containing mixtures, has to be applied as the procedure to provide evidence of compliance with Number 1.

Within the scope of the “Agreement on Workers’ Health Protection through the Good Handling and Use of Crystalline Silica and Products containing it”, manufacturers of cement have committed themselves to implement “Best Practices” for safe handling (http://www.nepsi.eu/good-practice-guide.aspx).

National legislation/requirements

The European Directive 2003/53 / EC was implemented by the Dutch government by translating, editing and publishing as Besluit 113 in Staatsblad van het Koninkrijk der Nederlanden of March 11, 2004.

15.2. Chemical Safety Assessment

ENCI has not carried out a chemical safety assessment.

SECTION 16: Other information

16.1 Indication of changes

Revision of this Safety Data Sheet Cement is based on the European Regulation (EU) no . 453/2010 (Revised Annex II of REACH) and classification according to the new CLP Regulation (EC) no. 1272/2008.
This Safety Data Sheet Cement replaces the ENCI version of Februari 2016

16.2 Identified uses and use descriptors and categories

The table below gives an overview of all relevant identified uses of cement or cement containing hydraulic binders. All the uses have been grouped in these identified uses because of the specific conditions of exposure for human health and environment. For each specific use, a set of risk management measures or localised controls has been derived (see section 8) which need to be put in place by the user of cement or cement containing hydraulic binders to bring the exposure to an acceptable level.

For the professional user, process categories and descriptors according to ECHA Guidance R.12 (ECHA-2010-G-05) can be assigned (see table).

PROC	Identified Uses – Use Description	Manufacture/ Formulation of building and construction materials	Professional/ Industrial use of building and construction materials
2	Use in closed, continuous process with occasional controlled exposure, eg industrial or professional manufacture of hydraulic binders	**X**	**X**
3	Use in closed batch process, eg industrial or professional manufacture of ready-mix concrete	**X**	**X**
5	Mixing or blending in batch process for formulation of mixtures and articles, eg industrial or professional manufacture of pre-cast concrete	**X**	**X**
7	Industrial spraying, eg industrial use of wet suspensions of hydraulic binders by spraying		**X**
8a	Transfer (charging/discharging) from/to vessels/large containers at non-dedicated facilities, eg use of cement in bags to prepare mortar		**X**
8b	Transfer (charging/discharging) from/to vessels/large containers at dedicated facilities, eg filling of silos, trucks or barges at cement plants	**X**	**X**
9	Transfer of substance or mixture into small containers, eg filling of cement bags in cement plants	**X**	**X**
10	Roller application or brushing, eg products to improve adherence between building surfaces and finishing products		**X**
11	Non-Industrial spraying, eg professional use of wet suspensions of hydraulic binders by spraying		**X**
13	Treatment of articles by dipping and pouring, eg covering of construction products with a layer to improve the performance of the product		**X**
14	Production of mixtures or articles by tabletting, compression extrusion, pelletisation, eg production of floor tiling	**X**	**X**
19	Hand-mixing with intimate contact and only PPE available, eg mixture of wet hydraulic binder on a construction site		**X**

22	Potentially closed processing operations with minerals/metals at elevated temperature in industrial setting, eg production of bricks		**X**
26	Handling of solid inorganic substances at ambient temperature, eg mixture of wet hydraulic binder	**X**	**X**

16.3 Abbreviations and acronyms

ACGIH	American Conference of Industrial Hygienists
ADR/RID	European Agreements on the transport of Dangerous goods by Road/Railway
APF	Assigned Protection Factor
CAS	Chemical Abstracts Service
CLP	Classification, labeling and packaging (Regulation (EC) No1272/2008)
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 HEPA Type of high efficiency air filter
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
MEASE	Metals estimation and assessment of substance exposure
MS	Member State
OELV	Occupational exposure limit value
PBT	Persistent, bio-accumulative and toxic PNECPredicted no-effect concentration
PROC	Process category
RE	Repeated exposure
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals (Regulation (EC) 1907/2006)
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 bioaccumulative
vPvB	Very persistent, very bio-accumulative
w/w	Weigth by weigth
WWTP	Waste water treatment plant

16.4 Key literature references and sources for data

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(3) Arbeidsomstandighedenregeling – artikel 4.19 Gevaarlijke stoffen en Bijlage XIII, lijst met wettelijke grenswaarden.

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(7) 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.

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(11) Final report Sediment Phase Toxicity Test Results with Corophium volutator for Portland clinker prepared for Norcem A.S. by AnalyCen Ecotox AS, 2007.

(12) TNO report V8801/02, An acute (4-hour) inhalation toxicity study with Portland Cement Clinker CLP/GHS 03-2010-fine in rats, August 2010.

(13) TNO report V8815/09, Evaluation of eye irritation potential of cement clinker G in vitro using the isolated chicken eye test, April 2010.

(14) TNO report V8815/10, Evaluation of eye irritation potential of cement clinker W in vitro using the isolated chicken eye test, April 2010.

(15) 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.

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(19) Exposure to thoracic dust, airway symptoms and lung function in cement production workers; Nordby, K.-C., et al; Eur Respir J, 2011. 38(6).

(20) 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, H. Notø, H. Kjuus, M. Skogstad en K.-C. Nordby, National Institute of Occupational Health, Oslo, Norway, march 2010.

(21) Occurrence of allergic contact dermatitis caused by chromium in cement. A review of epidemiological investigations, Kare Lenvik, Helge Kjuus, NIOH, Oslo, December 2011.

16.5 Training advice

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.

16.6 Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]

Classification according to Regulation (EC) No. 1272/2008	Classification Procedure
Skin Irrit. 2, H315	On basis of test data.
Eye Dam. 1, H318	On basis of test data.
Allergic skin reaction, 1B, H317	Human experience.
STOT SE 3, H335	Human experience.

16.7 Disclaimer

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 his/her own activities.