Material Safety Datasheet
HYDRATED LIME

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

1.1 Product identifier

Hydrated lime (Synonyms - Calcium dihydroxide, Calcium hydrate, Calcium hydroxide, Lime putty, Lime water, Slaked lime)
EINECS: 215-137-3
CAS: 1305-62-0
Reach Registration No. 01-2119475151-45-0135

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

Professional and Consumer use (DIY – do it yourself) as a building and construction material
No uses advised against

1.3. Details of the supplier of the safety data sheet

CEMEX UK Operations Ltd
CEMEX House, Evreux Way
Rugby, Warwickshire CV21 2DT
Tel: 01788 517000 (out of hours 01932 568833)
Fax: 01788 517009
www.cemex.co.uk

1.4. Emergency telephone number

For further information please contact
Customer Services on:
Tel: 01788 517000
(out of hours) 01932 568833
Fax: 01788 517009
Email: gb-enquiries@cemex.com

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

2.1.1 According to Regulation (EC) No 1272/2008

Hazard class	Hazard category
Skin irritation	2
Serious eye damage/eye irritation	1
Specific target organ toxicity single exposure respiratory tract irritation	3

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

2.1.2 *Classification according to Council Directive 67/548/EEC*

Xi Irritant

2.2. Label elements

2.2.1 According to Regulation (EC) No 1272/2008

Danger

P102: Keep out of reach of children
P280: Wear protective gloves/protective clothing/eye protection/face protection
P305+P351+P310: IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTRE or doctor/physician
P302+P352: IF ON SKIN: Wash with plenty of water
P261: Avoid breathing dust/spray
P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P501: Dispose of contents/container in accordance with current waste regulations

Wear protective gloves/protective clothing/eye protection/face protection
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
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention
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.

2.2.2 *According to Council Directive 67/548/EEC*

Indication of danger:
Xi irritant
Risk phrases:
R37: Irritating to respiratory system
R38: Irritating to skin
R41: Risk of serious damage to eyes
Safety phrases:
S2: Keep out of the reach of children
S25: Avoid contact with eyes
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S37: Wear suitable gloves
S39: Wear eye/face protection

2.3. Other hazards

The substance does not meet the criteria for PBT or vPvB substance.
No other hazards identified.

SECTION 3: Composition/information on ingredients

3.1. Substances

Main constituent
Name: Calcium dihydroxide
CAS: 1305-62-0
EINECS: 215-137-3
Impurities
No impurities relevant for classification and labelling.
Small quantities of calcium carbonate, calcium oxide and impurities. Impurities in lime products will vary from source to source

SECTION 4: First aid measures

4.1. Description of first aid measures

General notes
No known delayed effects. Consult a physician for all exposures except for minor instances.

Following contact with eyes
Rinse eyes immediately with plenty of water and seek medical advice.

Following skin contact
Carefully and gently brush the contaminated body surfaces in order to remove all traces of product. Wash affected area immediately with plenty of water. Remove contaminated clothing. If necessary seek medical advice.

Following inhalation
Move source of dust or move person to fresh air. Obtain medical attention immediately

Following ingestion
Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Obtain medical attention.

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

Calcium dihydroxide is not acutely toxic via the oral, dermal, or inhalation route. The substance is classified as irritating to skin and the respiratory tract, and entails a risk of serious damage to the eye. There is no concern for adverse systemic effects because local effects (pH effect) are the major health hazard.

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

Follow the advice given in section 4.1

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

5.1.1: Suitable Extinguishing media
The product is not combustible. Use a dry powder, foam or CO_2 fire extinguisher to extinguish the surrounding fire.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
5.1.2: Unsuitable extinguishing media
Do not use water.

5.2. Special hazards arising from the substance or mixture

None

5.3. Advice for fire-fighters

Avoid generation of dust. Use breathing apparatus. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Ensure adequate ventilation.
Keep dust levels to a minimum.
Keep unprotected persons away.
Avoid contact with skin, eyes, and clothing
Wear suitable protective equipment (see section 8).
Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8).

6.1.2 For emergency responders

As in 6.1.1

6.2. Environmental precautions

Contain the spillage. Keep the material dry if possible. Cover area if possible to avoid unnecessary dust hazard. Avoid uncontrolled spills to watercourses and drains (pH increase). Any large spillage into watercourses must be alerted to the Environment Agency or other regulatory body.

6.3. Methods and material for containment and cleaning up

In all cases avoid dust formation.
Keep the material dry if possible.
Pick up the product mechanically in a dry way.
Use vacuum suction unit, or shovel into bags.

6.4. Reference to other sections

See sections 8 and 13 for more details.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

7.1.1 Protective measures

Avoid contact with skin and eyes. Wear protective equipment (refer to section 8 of this safety data sheet). Do not wear contact lenses when handling this product. It is also advisable to have individual pocket eyewash. Keep dust levels to a minimum. Minimise dust generation. Enclose dust sources, use exhaust ventilation (dust collector at handling points). Handling systems should preferably be enclosed. When handling bags usual precautions should be paid to the risks outlined in the Council Directive 90/269/EEC.

7.1.2 Information on general occupational hygiene

Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no drinking, eating and smoking at the workplace. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2. Conditions for safe storage, including any incompatibilities

The substance should be stored under dry conditions. Any contact with air and moisture should be avoided. Bulk storage should be in purpose–designed silos. Keep away from acids, significant quantities of paper, straw, and nitro compounds. Keep out of reach of children. Do not use aluminium for transport or storage if there is a risk of contact with water.

7.3. Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

SCOEL recommendation (SCOEL/SUM/137 February 2008; see Section 16.6):
Occupational Exposure Limit (OEL), 8 h TWA: 1 mg/m³ respirable dust of calcium dihydroxide
Short-term exposure limit (STEL), 15 min: 4 mg/m³ respirable dust of calcium dihydroxide
PNEC aqua = 490 µg/l
PNEC soil/groundwater = 1080 mg/l

8.2. Exposure controls

To control potential exposures, generation of dust should be avoided. Further, appropriate protective equipment is recommended. Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.

8.2.1 Appropriate engineering controls

If user operations generate dust, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne dust levels below recommended exposure limits.

8.2.2 Individual protection measures such as personal protection equipment

Eye /face protection

Do not wear contact lenses. For powders, tight fitting goggles with side shields, or wide vision full goggles. It is also advisable to have individual pocket eyewash.

Skin protection

Since calcium dihydroxide is classified as irritating to skin, dermal exposure has to be minimised as far as technically feasible. The use of protective gloves (nitrile), protective standard working clothes fully covering skin, full length trousers, long sleeved overalls, with close fittings at openings and shoes resistant to caustics and avoiding dust penetration are required to be worn.

Respiratory protection

Local ventilation to keep levels below established threshold values is recommended. A suitable particle filter mask is recommended depending on the expected exposure levels. When

a person is potentially exposed to dust levels above exposure limits, use appropriate respiratory protection. It should be adapted to the dust level and conform to the relevant EN standard.

8.2.3 Environmental exposure controls

All ventilation systems should be filtered before discharge to atmosphere.
Avoid releasing to the environment.
Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance: White or off-white (beige) fine powder
Odour: odourless
Odour threshold: not applicable
pH: 12.4 (saturated solution at 20 °C)
Melting point: > 450 °C (study result, EU A.1 method)
Boiling point: not applicable (solid with a melting point > 450 °C)
Flash point: not applicable (solid with a melting point > 450 °C)
Evaporation rate: not applicable (solid with a melting point > 450 °C)
Flammability: non flammable (study result, EU A.10 method)
Explosive limits: non explosive (void of any chemical structures commonly associated with explosive properties)
Vapour pressure: not applicable (solid with a melting point > 450 °C)
Vapour density: not applicable
Relative density: 2.24 (study result, EU A.3 method)
Solubility in water: 1844.9 mg/L (study results, EU A.6 method)
Partition coefficient: not applicable (inorganic substance)
Auto ignition temperature: no relative self-ignition temperature below 400 °C (study result, EU A.16 method)
Decomposition temperature: When heated above 580°C, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H2O)
Viscosity: not applicable (solid with a melting point > 450 °C)
Oxidising properties: no oxidising properties (Based on the chemical structure, the substance does not contain a surplus of oxygen or any structural groups known to be correlated with a tendency to react exothermally with combustible material)

9.2. Other information

Not applicable.

SECTION 10: Stability and reactivity

10.1. Reactivity

In aqueous media Ca(OH)2 dissociates resulting in the formation of calcium cations and hydroxyl anions (when below the limit of water solubility).

10.2. Chemical stability

Under normal conditions of use and storage, calcium dihydroxide is stable

10.3. Possibility of hazardous reactions

Calcium dihydroxide reacts exothermically with acids. When heated above 580 °C, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H2O): Ca(OH)2□CaO + H2O. Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.

10.4. Conditions to avoid

Minimise exposure to air and moisture to avoid degradation.

10.5. Incompatible materials

Calcium dihydroxide reacts exothermically with acids to form salts. Calcium dihydroxide reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen.
$Ca(OH)2 + 2 Al + 6 H2O \rightarrow Ca[Al(OH)4]2 + 3 H2$

10.6. Hazardous decomposition products

None.
Further information: Calcium dihydroxide reacts with carbon dioxide to form calcium carbonate, which is a common material in nature.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

(Key - **Toxicity endpoints -** Outcome of the effects assessment)

Absorption
The primary health effect of calcium dihydroxide is local irritation due to a pH shift. Therefore, absorption is not a relevant parameter for the effects assessment.
Acute toxicity
Calcium dihydroxide is not acutely toxic.
Oral LD50> 2000 mg/kg bw (OECD 425, rat)
Dermal LD50> 2500 mg/kg bw (OECD 402, rabbit)
Inhalation no data available
Classification for acute toxicity is not warranted.
For irritating effects to the respiratory tract see below.
Irritation / corrosion
Eye irritation: Calcium dihydroxide entails a risk of serious damage to the eye (eye irritation studies (in vivo, rabbit).
Skin irritation: Calcium dihydroxide is irritating to skin (in vivo, rabbit).
Respiratory irritation: From human data it is concluded that Ca(OH)2 is irritating to the respiratory tract.
Based on experimental results, calcium dihydroxide requires classification as irritating to skin [R38, irritating to skin; Skin Irrit 2 (H315 – Causes skin irritation)] and as severely irritating to the eye [R41, Risk of serious damage to eye; Eye Damage 1 (H318 - Causes serious eye damage)].
As summarised and evaluated in the SCOEL recommendation (Anonymous, 2008), based on human data calcium dihydroxide is classified as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 – May cause respiratory irritation)].
Sensitisation
No data available.
Calcium dihydroxide is considered not to be a skin sensitiser, based on the nature of the effect (pH shift) and the essential requirement of calcium for human nutrition.
Classification for sensitisation is not warranted.
Repeated dose toxicity
Toxicity of calcium via the oral route is addressed by upper intake levels (UL) for adults determined by the Scientific Committee on Food (SCF), being
UL = 2500 mg/d, corresponding to 36 mg/kg bw/d (70 kg person) for calcium.
Toxicity of Ca(OH)2 via the dermal route is not considered as relevant in view of the anticipated insignificant absorption through skin and due to local irritation as the primary health effect (pH shift).
Toxicity of Ca(OH)2 via inhalation (local effect, irritation of mucous membranes) is addressed by an 8-h TWA determined by the Scientific Committee on Occupational Exposure Limits (SCOEL) of 1 mg/m³ respirable dust (see Section 8.1).
Therefore, classification of Ca(OH)2 for toxicity upon prolonged exposure is not required.

Mutagenicity
Bacterial reverse mutation assay (Ames test, OECD 471): Negative
Mammalian chromosome aberration test: Negative
In view of the omnipresence and essentiality of Ca and of the physiological non-relevance of any pH shift induced by lime in aqueous media, lime is obviously void of any genotoxic potential.

Classification for genotoxicity is not warranted.

Carcinogenicity

Calcium (administered as Ca-lactate) is not carcinogenic (experimental result, rat).
The pH effect of calcium dihydroxide does not give rise to a carcinogenic risk.
Human epidemiological data support lack of any carcinogenic potential of calcium dihydroxide.
Classification for carcinogenicity is not warranted.

Toxicity for reproduction

Calcium (administered as Ca-carbonate) is not toxic to reproduction (experimental result, mouse).
The pH effect does not give rise to a reproductive risk.
Human epidemiological data support lack of any potential for reproductive toxicity of calcium dihydroxide.
Both in animal studies and human clinical studies on various calcium salts no reproductive or developmental effects were detected. Also see the Scientific Committee on Food (Section 16.6). Thus, calcium dihydroxide is not toxic for reproduction and/or development.
Classification for reproductive toxicity according to regulation (EC) 1272/2008 is not required.

SECTION 12: Ecological information

12.1. Toxicity

12.1.1: Acute/Prolonged toxicity to fish

LC50 (96h) for freshwater fish: 50.6 mg/l
LC50 (96h) for marine water fish: 457 mg/l

12.1.2: Acute/Prolonged toxicity to aquatic invertebrates

EC50 (48h) for freshwater invertebrates: 49.1 mg/l
LC50 (96h) for marine water invertebrates: 158 mg/l

12.1.3: Acute/Prolonged toxicity to aquatic plants

EC50 (72h) for freshwater algae: 184.57 mg/l
NOEC (72h) for freshwater algae: 48 mg/l

12.1.4: Toxicity to micro-organisms e.g. bacteria

At high concentration, through the rise of temperature and pH, calcium dihydroxide is used for disinfection of sewage sludges.

12.1.5: Chronic toxicity to aquatic organisms

NOEC (14d) for marine water invertebrates: 32 mg/l

12.1.6: Toxicity to soil dwelling organisms

EC10/LC10 or NOEC for soil macroorganisms: 2000 mg/kg soil dw
EC10/LC10 or NOEC for soil microorganisms: 12000 mg/kg soil dw

12.1.7: Toxicity to terrestrial plants

NOEC (21d) for terrestrial plants: 1080 mg/kg

12.1.8: General effect

Acute pH effect. Although this product is useful to correct water acidity, an excess of more than 1 g/l may be harmful to aquatic life. pH value of > 12 will rapidly decrease as result of dilution and carbonation.

12.2. Persistence and degradability

Not relevant for inorganic substance

12.3. Bioaccumulative potential

Not relevant for inorganic substance

12.4. Mobility in soil

Calcium dihydroxide, which is sparingly soluble, presents a low mobility in most soils

12.5. Results of PBT and vPvB assessment

Not relevant for inorganic substances

12.6. Other adverse effects

No other adverse effects are identified

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal of calcium dihydroxide should be in accordance with local and national legislation. Processing, use or contamination of this product may change the waste management options. Dispose of container and unused contents in accordance with applicable member state and local requirements.
The used packing is only meant for packing this product; it should not be reused for other purposes. After usage, empty the packing completely.

SECTION 14: Transport information

Calcium dihydroxide is not classified as hazardous for transport (ADR (Road), RID (Rail), IMDG / GGVSea (Sea).

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

Avoid any release of dust during transportation, by using air-tight tanks.

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

Not relevant.

SECTION 15: Regulatory information

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

Authorisations:
Not required
Restrictions on use
None
Other EU Regulations
Calcium dihydroxide is not a SEVESO substance, not an ozone-depleting substance and not a persistent organic pollutant.
National regulations

None

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out for this substance.

SECTION 16: Other information

16.1 Indication of changes

Supersedes March 2009 version and incorporates requirements of Regulation (EC) No 1272/2008.

16.2 Abbreviations and acronyms

EC50: median effective concentration
LC50: median lethal concentration
LD50: median lethal dose
NOEC: no observable effect concentration
OEL: occupational exposure limit
PBT: persistent, bioaccumulative, toxic chemical
PNEC: predicted no-effect concentration
SCOEL: Scientific Committee on occupational exposure limits
STEL: short-term exposure limit
TWA: time weighted average
vPvB: very persistent, very bioaccumulative chemical

16.3 Key literature references and sources of data

1. Anonymous, 2006: Tolerable upper intake levels for vitamins and minerals Scientific Committee on Food, European Food Safety Authority, ISBN: 92-9199-014-0 [SCF document]
2. Anonymous, 2008: Recommendation from the Scientific Committee on Occupational Exposure Limits (SCOEL) for calcium oxide (CaO) and calcium dihydroxide (Ca(OH)2)
3. European Commission, DG Employment, Social Affairs and Equal Opportunities, SCOEL/SUM/137 February 2008

16.4 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.

16.5 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.