

Limesol/Puresol Calcium Hydroxide Solution

Product Safety Data Sheet

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

1.1 Identification of the substance or preparation

Substance name: Calcium Hydroxide slurry, Milk of lime (MOL), Hydrated lime solution, calcium dihydroxide
Tradenames: Limesol, Puresol
Chemical Description: Calcium hydroxide solution – 40-45% Ca(OH)₂
CAS Number 1305-62-0
EINECS Number 215-137-3

1.2 Use of the substance/preparation

Hydrated lime slurries or solutions are typically used in applications such as water treatment, waste water treatment and chemical processes.

1.3 Company identification

Name: Alkali Solutions Ltd
Address: Jacobs Well, Suffolk Lane, Abberley, Worcs, WR6 6BE
Telephone: +44 (0) 1299 896825
E-mail: info@alkalisolutions.co.uk

1.4 Emergency telephone

Emergency telephone number available during office hours: 01299 896825

Emergency telephone number available outside office hours: No

2. HAZARDS IDENTIFICATION

2.1 Hazard characterization

2.1.1 Classification according to Regulation (EC) 1272/2008

STOT single Exp 3, Route of exposure: Inhalation

Skin Irritation 2

Eye Damage 1

2.1.2 Classification according to Directive 67/548/EEC

Xi – irritant

2.2 Label Elements

2.2.1 Labeling according to Regulations (EC) 1272/2008

Signal word: Danger

Hazard Pictogram:



Hazard Statements:

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

Precautionary Statements

P102: Keep out of reach of children
P280: Wear protective gloves/protective clothing/eye protection/face protection
P305+P351+P330: IF IN EYES: Rinse cautiously with water for several minutes. Immediately call 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 the local/regional/national/international regulation

2.2.2 Labelling according to 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 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.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Chemical composition

Substance	Calcium Hydroxide solution 45% Ca(OH) ₂
Trivial Name	Slaked lime, Hydrated lime solution, Milk of Lime, MOL
CAS number	1305-62-0
EINECS Number	215-137-3

No impurities relevant for classification and labeling.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

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

Following skin contact

Wash affected area immediately with plenty of water. Remove contaminated clothing. If necessary seek medical advice.

Following eye contact

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

After 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 hydroxide is not acutely toxic via oral, dermal or inhalation route. The substance is classified as irritating to skin and the respiratory tract, and entails a risk of serious damaged 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 advise given in section 4.1

5. FIRE - FIGHTING MEASURES

5.1 Extinguishing media

The product does not burn. All types of extinguishing media are suitable including water, carbon dioxide, dry powder or foam.

5.2 Special Hazards arising from the substance or mixture

None

5.3 Advice for firefighters

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

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

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)

6.2 Environment precautions

Contain the spillage. Avoid uncontrolled spills to watercourses and drains (pH increase). Any large spillage into watercourses must be reported to the Environment Agency or other regulatory body.

6.3 Methods and material for containment and cleaning up

In all cases avoid dust formation

Use vacuum suction unit, pumps or shovel into bags

6.4 Reference to other sections

For more information on exposure controls/personal protection or disposal considerations, please check section 8 and 13.

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: Advice 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)

Please check the identified uses in table 1 of the Appendix of this SDS. For more information please see the relevant exposure scenario, available in the Appendix, and check '2.1: Control of worker' in the relevant exposure scenario section in the Appendix.

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 hydroxide

Short-term exposure limit (STEL), 15 min: 4 mg/m³ respirable dust of calcium hydroxide

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 protective equipment

8.2.2.1: 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.

8.2.2.2: Skin protection Since calcium hydroxide 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.

8.2.3.3 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 - please check the relevant exposure scenario, given in the Appendix/available via your supplier

8.2.2.4: Thermal Hazards The substance does not represent a thermal hazard, thus special consideration is not required.

8.2.3 Environmental Exposure

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.

For detailed explanations of the risk management measures that adequately control exposure of the environment to the substance please check the relevant exposure scenario, available via your supplier.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Calcium Hydroxide	
Description	A milky white suspension of solids in water
Odour	odourless
pH (saturated solution)	12.5 (Ca(OH) ₂ at 25 °C)
Boiling Range/Point	100 °C
Melting Point (of Ca(OH) ₂)	550°C
Decomposition Temperature	580°C (CaO and water)
Median particle size	<5 µm
Viscosity	500-100cP
Flash Point (PMCC)	Not applicable, non combustible
Auto-flammability	Not auto-flammable
Flammability	Non-flammable
Explosive Properties	Stable under normal conditions
Vapour Pressure	Negligible vapour pressure at ambient conditions
Relative Density	1.3 g/cm ³

10. STABILITY AND REACTIVITY

10.1 Reactivity

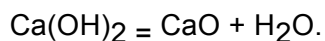
In aqueous media Ca(OH)₂ dissociates resulting in the formation of calcium cations and hydroxyl anions (when below the limit of water solubility).

10.2 Chemical Stability

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

10.3 Possibility of Hazardous reactions

Calcium hydroxide reacts exothermically with acids. When heated above 580 °C, calcium hydroxide decomposes to produce calcium oxide (CaO) and water (H₂O):

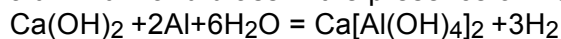


10.4: Conditions to avoid

Minimise exposure to air and moisture to avoid degradation.

10.5: Incompatible Materials

Calcium hydroxide reacts exothermically with acids to form salts. Calcium hydroxide reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen.



10.6: Hazardous Decomposition Products

None.

Further information: Calcium hydroxide reacts with carbon dioxide to form calcium carbonate, which is a common material in nature.

11. TOXICOLOGICAL INFORMATION

Toxicity endpoints	Outcome of the effects assessment
Acute toxicity	<p>Calcium hydroxide is not acutely toxic.</p> <p>Oral LD50 > 2000 mg/kg bw (OECD 425, rat)</p> <p>Dermal LD50 > 2500 mg/kg bw (OECD 402, rabbit)</p> <p>Inhalation no data available</p> <p>Classification for acute toxicity is not warranted</p> <p>For irritation effects to the respiratory tract see below.</p>
Skin irritation / corrosion	<p>Eye irritation: Calcium hydroxide entails a risk of serious damage to the eye (eye irritation studies (<i>in vivo</i>, rabbit). Based on experimental results, calcium hydroxide requires classification as severely irritating to the eye [R41, Risk of serious damage to eye; Eye Damage 1 (H318 - Causes serious eye damage)].</p> <p>Skin irritation: Calcium hydroxide is irritating to skin (<i>in vivo</i>, rabbit). Based on experimental results, calcium hydroxide requires classification as irritating to skin [R38, irritating to skin; Skin Irrit 2 (H315 – Causes skin irritation)].</p>
Respiratory or skin sensitisation	No data available. Calcium hydroxide 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.
Germ cell 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 including germ cell mutagenicity. Classification for genotoxicity is not warranted.
Carcinogenicity	Calcium (administered as Ca-lactate) is not carcinogenic (experimental result, rat). The pH effect of calcium hydroxide does not give rise to a carcinogenic risk. Human epidemiological data support lack of any carcinogenic potential of calcium hydroxide. 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 hydroxide. 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 hydroxide is not toxic for reproduction and/or development. Classification for reproductive toxicity according to regulation (EC) 1272/2008 is not required
STOT – single exposure	From human data it is concluded that Ca(OH) ₂ is irritating to the respiratory tract. As summarised and evaluated in the SCOEL recommendation (Anonymous, 2008), based on human data calcium hydroxide is classified as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 – May cause respiratory irritation)].
STOT – repeated	Toxicity of calcium via the oral route is addressed by upper intake levels

exposure	(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/m ³ respirable dust (see Section 8.1). Therefore, classification of Ca(OH) ₂ for toxicity upon prolonged exposure is not required.
Aspiration hazard	Calcium hydroxide is not known to present an aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

12.1.1: Acute/Prolonged toxicity to fish	LC (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
12.1.3: Acute/Prolonged toxicity to aquatic plants	mg/l 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 hydroxide 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	EC 10/LC10 or NOEC for soil macroorganisms: 2000 mg/kg soil dw EC 10/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 as hydrated lime is an inorganic material.

12.4 Mobility in Soils

Calcium hydroxide, 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

13. DISPOSAL CONSIDERATIONS

13.1 Waste Treatment

Disposal of calcium hydroxide 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.

14. TRANSPORT INFORMATION

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

14.1: UN Number	Not regulated
14.2: UN Proper Shipping Name	Not regulated
14.3: Transport Hazard classes	Not regulated
14.4: Packing Group	Not regulated
14.5: Environmental hazards	None
14.6: Special precautions for user	None
14.7: Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not regulated

15. REGULATORY INFORMATION

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

Authorisations: Not required
Restrictions on use: None

Other EU Regulations	Calcium hydroxide 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.

16. OTHER INFORMATION

Data are based on our latest knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationship.

16.1 Hazard Statements

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

16.2 Precautionary Statements

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 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 the local/regional/national/international regulation

16.3 Risk Phrases

R37:	Irritating to respiratory system
R38:	Irritating to skin
R41:	Risk of serious damage to eyes

16.4 Safety Phrases

S2	Keep out of 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

16.5: Abbreviations

EC ₅₀ :	median effective concentration	LC ₅₀ :	median lethal concentration
LD ₅₀ :	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

16.6: Key Literature References

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]

Anonymous, 2008: Recommendation from the Scientific Committee on Occupational Exposure Limits (SCOEL) for calcium oxide (CaO) and calcium hydroxide (Ca(OH)₂), European Commission, DG Employment, Social Affairs and Equal Opportunities, SCOEL/SUM/137 February

16.7 Revision

This version produced in reference to Annex II of the REACH Regulation (EC) 1907/2006

Disclaimer

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation (EC 1907/2006; article 31 and Annex II), as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.

End of the safety data sheet