SAFETY DATA SHEET: CALCIUM DIHYDROXIDE

(Prepared in accordance with Annex II of the REACH Regulation EC 1907/2006, Regulation (EC) 1272/2008 and Regulation (EC) 453/2010)

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

1.1 Identification of the substance or preparation

Substance name:	Calcium Dihydroxide, Hydrated Lime
Synonyms:	Calcium Hydroxide, Slaked Lime, Calcium Hydrate, Milk of Lime, Lime Putty, Lime Water. Please note this list may not be exhaustive.
Chemical name and formula:	Calcium dihydroxide – $Ca(OH)^2$
Trade name:	Mike Wye Ltd: Lime Putty, Lime Mortar, Lime Plaster, Lime Filler, Venetian Plaster, Limewash
CAS:	1305-62-0
EINECS:	215-137-3
Molecular weight:	74.09g/mol
REACH registration number:	01-2119475151-45-0289

1.2 Use of the substance

Please check identified uses. There are no uses advised against.

1.3 Company identification

Name:	Mike Wye Ltd
Address	Buckland Filleigh Sawmills Buckland Filleigh Beaworthy Devon EX21 5RN
Telephone:	+441409 281644
E-mail:	sales@mikewye.co.uk

1.4 Emergency telephone numbers

UK Emergency number:	999
European Emergency number:	112
Emergency telephone number:	+441409 281644 (not available outside office hours: Mon-Fri)

Refer to Hospital Accident and Emergency Department

2 HAZARDS IDENTIFICATION

2.1 Classification of the substance

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 Labelling according to Regulation (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+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

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 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.

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Composition

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.

4 FIRST AID MEASURES

4.1 General advice

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

Following eye contact
Rinse eyes immediately with plenty of water and 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

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.

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

5 FIRE FIGHTING MEASURES

5.1 Extinguishing media

5.1.1 Suitable extinguishing media

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.

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).

6.2 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

For more information on exposure controls/personal protection or disposal considerations please check sections 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). Do not wear contact lenses when handling this product. It is also advisable to have individual pocket eyewash. Keep dust levels to a minimum. Minimize 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 the 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 the end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibles
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 identified uses. For more information please contact Mike Wye Ltd.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

SCOEL recommendation (SCOEL/SUM/137 February 2008; see Section 16.6):

Occupational Exposure Limit (OEL), 8h TWA: 1mg/m³ respirable dust of calcium dihydroxide
Short-term Exposure Limit (STEL), 15 min: 4mg/m³ respirable dust of calcium dihydroxide

PNEC aqua = 490µg/l
PNEC soil/groundwater = 1080mg/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 dihydroxide is classified as irritating to skin, dermal exposure has to be minimised as far as technically feasible. The use of protective gloves, 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.

8.2.2.3 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.

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 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.

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance: White

Odour:	Odourless
Odour threshold:	not applicable
pH:	12.4 (saturated solution at 20ºC)
Melting point:	>450ºC (study result, EU A.1 method)
Boiling point:	not applicable (solid with a melting point >450ºC)
Flash point:	not applicable (solid with a melting point >450ºC)
Evaporation rate:	not applicable (solid with a melting point >450ºC)
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 >450ºC)
Vapour density:	not applicable
Relative density:	2.24 (study results, EU A.3 method)
Solubility in water:	1844.9mg/L (study results, EU A.6 method)
Partition coefficient:	not applicable (inorganic substance)
Auto ignition temperature:	no relative self-ignition temperature below 400ºC (study result, EU A.16 method)
Decomposition temperature:	When heated above 580ºC, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H^2O)
Viscosity:	not applicable (solid with a melting point >450ºC)
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 available

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 580ºC, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H^2O): $Ca(OH)^2 \rightarrow CaO + H^2O$.
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 degeneration.

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.
$Ca(OH)^2 + 2Al + 6H^2O \rightarrow Ca[Al(OH)_4]^2 + 3H^2$

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.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Oral LD_{50} > 2000mg/kg bw (OECD 425, rat)
Dermal LD_{50} > 2500mg/kg bw (OECD 402, rabbit)
Inhalation no data available
Calcium dihydroxide is not acutely toxic.
Classification for acute toxicity is not warranted.

Skin irritation

Calcium dihydroxide is irritating to skin (*in vivo,* rabbit).
Based on the experimental results, calcium dihydroxide requires classification as irritating to skin [R38, irritating to skin; Skin Irrit 2 (H315 – Causes skin irritation)]

Serious eye damage/irritation

Calcium dihydroxide entails a risk of serious damage to the eye (eye irritation studies *in vivo*, rabbit). Based on experimental results, calcium dihydroxide requires classification as severely irritating to the eye [R41, Risk of serious damage to eye; Eye Damage 1 (H318 – Causes serious eye damage)].

Respiratory or skin sensation

No data available.
Calcium dihydroxide is considered not to be a skin sensitizer, 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 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.

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 dihydroxide is classified as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 – May cause respiratory irritation)].

STOT-repeated exposure

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 = 2500mg/d, corresponding to 36 mg/kg bw/d (70kg 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 1mg/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_{50} (96h) for freshwater fish: 50.6mg/l
LC_{50} (96h) for marine water fish: 457mg/l

12.1.2 Acute/Prolonged toxicity to aquatic invertebrates

EC_{50} (48h) for freshwater invertebrates: 49.1mg/l
LC_{50} (96h) for marine water invertebrates: 158mg/l

12.1.3 Acute/Prolonged toxicity to aquatic plants

EC_{50} (72h) for freshwater algae: 184.57mg/l
NOEC (72h) for freshwater algae: 48mg/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: 32mg/l

12.1.6 Toxicity to soil dwelling organisms

EC_{10}/LC_{10} or NOEC for soil macroorganisms: 2000mg/kg soil dw
EC_{10}/LC_{10} or NOEC for soil macroorganisms: 12000mg/kg soil dw

12.1.7 Toxicity to terrestrial plants

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

12.1.8 General effect

Acute pH-effect. Although this product is useful to correct water acidity, an excess of more than 1g/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 substances

12.3 Bioaccumulative potential

Not relevant for inorganic substances

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

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 packaging 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 dihydroxide 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 class(es)

Not regulated

14.4 Packing group

Not regulated

14.5 Environmental hazards

None

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 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 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.

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	IF IN EYES: Rinse cautiously with water for several minutes
P310:	Immediately call a POISON CENTRE or doctor/physician
P302+P352:	IF ON SKIN: Wash with plenty of soap and water
P261:	Avoid breathing dust/fume/gas/mist/vapours/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

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 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

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
STEL: short-term exposure limit
TWA: time weighted average
vPvB: very persistent, vey 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 dihydroxide ($Ca(OH)^2$), European Commission, DG Employment, Social Affairs and Equal Opportunities, SCOEL/SUM/137 February 2008

16.7 Revision

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

<u>Disclaimer</u>

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation (EC 1907/2006; article 31and 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 the 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