SAFETY DATA SHEET
Hydrated Lime

Issued: 20/01/2015
Revision No: 1

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

Identification of the substance or preparation:

Substance Name:	Hydrated lime, Calcium dihydroxide, Calcium hydrate, Calcium hydroxide.
Synonyms:	Lime putty, Lime water, Slaked lime,
Chemical Name and Formula:	Calcium dihydroxide – Ca(OH)2
Trade Name:	Limbux, Kalic
CAS No:	1305-62-0
EINECS No:	215-137-3
Molecular Weight:	74.09
Reach Registration No:	01-2119475151-45-0135

Use of the substance:	Please check the identified uses in table 1 of the Appendix of this SDS.
Uses advised against:	There are no uses advised against

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2. HAZARDS IDENTIFICATION

Classification of the Substance:
Classification according to Regulation (EC) 1272/2008
STOT Single Exp. 3, Route of exposure: Inhalation
Skin Irritation 2
Eye Damage 1

Classification according to Directive 67/548/EEC
Xi – irritant

Label elements:
Labelling according to Regulation (EC) 1272/2008
Signal word: Danger
Hazard pictogram:

[cont…]

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

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

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

3. COMPOSITION / INFORMATION ON INGREDIENTS

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

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

Following Eye Contact: Rinse eyes immediately with plenty of water and seek medical advice.

[cont…]

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.

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.

Indication of any immediate medical attention and special treatment needed: Follow the advice given in section 4.1

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing media: The product is not combustible. Use a dry powder, foam or CO2 fire extinguisher to extinguish the surrounding fire. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media: Do not use water.

Special hazards arising from the substance or mixture: None

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

Personal precautions, protective equipment and emergency procedures:

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).

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.

[cont…]

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.

Reference to other sections: For more information on exposure controls/personal protection or disposal considerations, please check section 8 and 13 and the Appendix of this safety data sheet.

7. HANDLING AND STORAGE

Precautions for safe handling:

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.

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.

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.

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

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

[cont…]

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. Please check the relevant exposure scenario, given in the Appendix.

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.

Individual protection measures, such as personal protective 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 - please check the relevant exposure scenario, given in the Appendix/available via your supplier.

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

Environmental Exposure: All ventilation systems should be filtered before discharge to Control 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. For further detailed information, please check the Appendix of this SDS.

9. PHYSICAL AND CHEMICAL PROPERTIES

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)

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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)
Other information:	Not available

10. STABILITY AND REACTIVITY

Reactivity:	In aqueous media Ca(OH)2 dissociates resulting in the formation of calcium cautions and hydroxyl anions (when below the limit of water solubility).
Chemical Stability:	Under normal conditions of use and storage, calcium dihydroxide is stable

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.

Conditions to avoid:	Minimise exposure to air and moisture to avoid degradation.
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 □ Ca[Al(OH)4]2 + 3 H2

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

Information on toxicological effects:

Toxicity endpoints Outcome of 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)

[cont…]

Inhalation: no data available
Classification for acute toxicity is not warranted.

Skin irritation/Eye irritation: Calcium dihydroxide entails a risk of serious damage to the eye corrosion (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)].

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

Respiratory or skin 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.

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 = 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).

[cont…]

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.

Aspiration hazard: Calcium hydroxide is not known to present an aspiration hazard.

12. ECOLOGICAL INFORMATION

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

Acute/Prolonged toxicity to aquatic invertebrates: EC50 (48h) for freshwater invertebrates: 49.1 mg/l
LC50 (96h) for marine water invertebrates: 158

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

Toxicity to microorganisms e.g. bacteria: At high concentration, through the rise of temperature and pH, calcium dihydroxide is used for disinfection of sewage sludges.

Chronic toxicity to aquatic organisms: NOEC (14d) for marine water invertebrates: 32 mg/l

Toxicity to soil dwelling organisms: EC 10/LC10 or NOEC for soil macro organisms: 2000 mg/kg soil dw
EC 10/LC10 or NOEC for soil microorganisms: 12000 mg/kg soil dw

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

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.

Persistence and Degradability: Not relevant for inorganic substance.

Bioaccumulative potential: Not relevant for inorganic substance.

Mobility in Soils: Calcium dihydroxide, which is sparingly soluble, presents a low mobility in most soils.

Results of PBT and vPvB assessment: Not relevant for inorganic substances.

Other adverse effects: No other adverse effects are identified.

[cont…]

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

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

UN No: Not regulated
UN Proper Shipping Name: Not regulated
Transport Hazard classes: Not regulated
Packing Group: Not regulated
Environmental hazards: None
Special precautions for user: Avoid any release of dust during transportation, by using air-tight tanks
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not regulated

15. REGULATORY INFORMATION

Note: The regulatory information given above only indicates the principal regulations specifically Applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

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: 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

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

[cont…]

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

Abbreviations:

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

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.

Legal disclaimer: