

SAFETY DATA SHEET

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1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

1.1 Product identifier

Substance name: Hydrated Lime, Calcium dihydroxide

Synonyms: Lime, Lime putty, slaked lime, Milk of lime, Building lime, Fat lime, mortar lime

Chemical name and formula: Calcium dihydroxide – Ca(OH)₂

Trade name: Wood-burned lime putty

CAS: 1305-62-0

EINECS: 215-137-3

Molecular weight: 74.09 g/mol

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

There are no uses advised against.

1.3 Details of the supplier of the safety datasheet

Name: Deffner & Johann GmbH

Address: Mühläckerstraße 13, 97520 Röthlein, Germany

Phone No.: +49 9723 9350-0

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1.4 Emergency telephone number

European Emergency No.: +49 9723 9350-0 (Mo. - Fr.: 8:00 - 15:00)

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, Risk phrases:

R37: Irritating to respiratory system

R38: Irritating to skin

R41: Risk of serious damage to eyes

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 local, regional, national and international regulation – use a registered hazardous waste carrier/licence holder, and/or contact the manufacturer

2.2.2 Labelling according to Directive 67/548/EEC

Indication of danger: Xi irritant

Safety phrases:

S2: Keep out of the reach of children

S25: Avoid contact with eyes

S26: In case of contact with eyes, rinse

S37: Wear suitable gloves immediately with plenty of water and seek medical advice

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 Substances

Main constituent

Name: Calcium dihydroxide

CAS: 1305-62-0

EINECS: 215-137-3

Concentration: 55 - 965 %

Impurities: No impurities relevant for classification and labelling.

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 inhalation*

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

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 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

Natural hydrated lime 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 advises given in section 4.1

5 FIREFIGHTING MEASURES

5.1 Extinguishing media

5.1.1 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.

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. Lime Product Safety Data Sheet.

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

Keep dust levels to a minimum. Ensure adequate ventilation. 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 un-necessary 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 section 8 and 13 and the Annex of this safety data sheet.

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. Minimize dust generation. Enclose dust sources, use exhaust ventilation (dust collector at handling point). 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 via your supplier/given in the Appendix, and check section 2.1: Control of worker exposure.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

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

Workplace Exposure Limit (WEL), 8 h

TWA: 5 mg/m³

Occupational Exposure Limit (OEL), 8h

TWA: 1 mg/m³ respirable dust of calcium oxide

Short-term exposure limit (STEL), 15 min: 4 mg/m³ respirable dust of calcium oxide This value is read-across to natural hydrated lime in view of the anticipated local effect (pH is comparable to that of CaO and Ca(OH)₂)

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. cloed 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/available via your supplier.

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 natural hydrated lime 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.

8.2.2.3 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 - 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 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. 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

9.1 Information on basic physical and chemical properties

Appearance: solid, white or grey putty

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 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: 1.35 (study result, EU A.3 method)
Solubility in water: Moderately soluble (study result, modified EU A.6 method)
Partition coefficient: not applicable (inorganic substance)
Auto ignition temperature: no relative selfignition temperature below 400 °C (study result, EU A.16 method)
Decomposition temperature: not applicable 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 available

10 STABILITY AND REACTIVITY

10.1 Reactivity

In aqueous media $\text{Ca}(\text{OH})_2$ 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, the substance is stable.

10.3 Possibility of hazardous reactions

Natural hydrated lime reacts exothermically with acids. When heated above 580 °C, calcium dihydroxide decomposes to produce calcium oxide (CaO) and water (H_2O): $\text{Ca}(\text{OH})_2 \rightarrow \text{CaO} + \text{H}_2\text{O}$. 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

Natural hydrated lime reacts exothermically with acids to form salts. Reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen $\text{Ca}(\text{OH})_2 + 2 \text{Al} + 6 \text{H}_2\text{O} \rightarrow \text{Ca}[\text{Al}(\text{OH})_4]_2 + 3 \text{H}_2$

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

Natural hydrated lime is classified as irritating to skin and the respiratory tract and it entails a risk of serious damage to the eye. The occupational exposure limit for the prevention of local sensory irritation and decrease of lung function parameters as critical effects is OEL (8 h) = 1 mg/m³ respirable dust (read-across from calcium oxide and calcium dihydroxide)

a. 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.

b. Acute toxicity

Natural hydrated lime is not acutely toxic. An acute dermal or inhalation toxicity study with natural hydrated lime is considered to be scientifically unjustified.

- Oral: LD50 > 2000 mg/kg bw (OECD 425, test substance Ca(OH)₂ rat); The results are also applicable to lime (chemical) hydrated by read-across.

- Dermal: no data available

- Inhalation: no data available

Classification for acute toxicity is not warranted. For irritating effects to the respiratory tract see below.

c. Irritation / corrosion

- Eye Irritation: Calcium dihydroxide entails a risk of serious damage to the eye (eye irritation studies (in vivo, rabbit). By read across these results are also applicable to natural hydrated lime.

- Skin Irritation: Calcium dihydroxide is irritating to skin. By read across these results are also applicable to natural hydrated lime.

- Respiratory Irritation: From human data on calcium oxide and hydroxide it is concluded by read-across (worst case approach) that natural hydrated lime is irritating to the respiratory tract.

Based on experimental results on a similar substance utilised by read-across, natural hydrated lime 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)]. Based on human data as summarised and evaluated in the SCOEL recommendation (Anonymous, 2008), and by read-across from the similar substances CaO and Ca(OH)₂ natural hydrated lime is classified as irritating to the respiratory system [R37, Irritating to respiratory system; STOT SE 3 (H335 – May cause respiratory irritation)].

d. Sensitisation:

No data available. Natural hydrated lime 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. Furthermore, none of the compounds making up the other main constituents or impurities, i.e. calcium carbonate, calcium silicate, and calcined clayminerals, are known to entail any sensitisation potential. Classification for sensitisation is not warranted.

e. 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 natural hydrated lime 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 natural hydrated lime via inhalation (local effect, irritation of mucous membranes) is addressed by an 8-h TWA determined for CaO and Ca(OH)₂ by the Scientific Committee on Occupational Exposure Limits (SCOEL) of 1 mg/m³ respirable dust (read-across from CaO and Ca(OH)₂; see Section 8.1).

Therefore, classification of natural hydrated lime for toxicity upon prolonged exposure is not required.

f. Mutagenicity

Bacterial reverse mutation assay (Ca(OH)₂ and CaO, Ames tests, OECD 471): Negative.

Mammalian chromosome aberration test

(Ca(OH)₂): Negative.

These results are applicable to natural hydrated lime by read across. Natural hydrated lime does not contain any main constituents or major impurities that are known to be genotoxic. The pH effect of natural hydrated lime does not give rise to a mutagenic risk. Human epidemiological data support lack of any mutagenic potential of natural hydrated lime. Classification for genotoxicity is not warranted.

g. Carcinogenicity

Calcium (when administered as Ca-lactate) is not carcinogenic (experimental result, rat).

The pH effect does not give rise to a carcinogenic risk. Human epidemiological data support lack of any carcinogenic potential of natural hydrated lime. Classification for carcinogenicity is not warranted.

h. 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 natural hydrated lime. 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, natural hydrated lime is not toxic for reproduction and/or development.

Classification for reproductive toxicity according to regulation (EC) 1272/2008 is not required.

12 ECOLOGICAL INFORMATION

12.1 Toxicity

12.1.1 Acute/Prolonged toxicity to fish

LC50 (96h) for freshwater fish: 50.6 mg/l (calcium dihydroxide)

LC50 (96h) for marine water fish: 457 mg/l (calcium dihydroxide)

12.1.2 Acute/Prolonged toxicity to aquatic invertebrates

EC50 (48h) for freshwater invertebrates: 49.1 mg/l (calcium dihydroxide)

LC50 (96h) for marine water invertebrates: 158 mg/l (calcium dihydroxide)

12.1.3 Acute/Prolonged toxicity to aquatic plants

EC50 (72h) for freshwater algae: 184.57 mg/l (calcium dihydroxide)

NOEC (72h) for freshwater algae: 48 mg/l (calcium dihydroxide)

12.1.4 Toxicity to micro-organisms e.g. bacteria

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

12.1.5 Chronic toxicity to aquatic organisms

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

12.1.6 Toxicity to soil dwelling organisms

EC10/LC10 or NOEC for soil macro organisms: 2000 mg/kg soil dw (calcium dihydroxide)

EC10/LC10 or NOEC for soil micro organisms: 12000 mg/kg soil dw (calcium dihydroxide)

12.1.7 Toxicity to terrestrial plants

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

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 substances

12.3 Bioaccumulative potential

Not relevant for inorganic substances

12.4 Mobility in soil

Natural hydrated lime reacts with water and/or carbon dioxide to form respectively calcium dihydroxide and/or calcium carbonate which is sparingly soluble, and present 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 natural hydrated lime 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

Natural hydrated lime 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

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 for powders and covered trucks for pebbles

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: Natural hydrated lime is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant.

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 local/ regional/national/international regulation - use a registered hazardous waste carrier/licence holder, and/or contact the manufacturer

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

EC50: median effective concentration

LC50: median lethal concentration

LD50: median lethal dose

NOEC: no observable effect concentration

WEL: workplace exposure limit

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, very bioaccumulative chemical

EULA: European Lime Association

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,

16.7 Revision

SDS revised in accordance with EULA SDS format

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.