



Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

1 - 8

1	Identification of the substance/preparation and of the company/undertaking	
1.1	Identification of the substance or preparation	
	Substance name:	Calcium oxide
	Synonyms:	Lime, burnt lime, un-slaked lime, building lime, fat lime, chemical lime, fluxing lime, soft burnt lime, pebble lime, calcium oxide, calcium monoxide, quick lime. calcined limestone. Please note that this list may not be exhaustive.
	Chemical name and formula:	Calcium oxide - CaO
	Trade name:	nekafer[®]/nekafin[®]/nekasol[®]
	CAS No.:	1305-78-8
	EINECS No.:	215-138-9
	Molecular weight:	56.08 g/mole
	REACH Registration number:	01-2119475325-36-0017
	REACH EU Only Representative:	GGCert, Köln
1.2	Relevant identified uses of the substance or mixture and uses advised against:	Please check the identified uses in table 1 of the Appendix of this SDS. There are no uses advised against.
1.3	Details of the supplier of the safety data sheet	
	Name:	Kalkfabrik Netstal AG
	Address:	CH-8754 Netstal/Switzerland
	Phone:	+41 55 646 91 11
	Fax:	+41 55 646 92 66
	E-mail of competent person responsible for SDS:	dirk.sewing@kfn.ch
1.4	Emergency telephone number	
	European emergency No.	112
	For inquiries inside Switzerland:	145 (24 h/d) Schweizerisches Toxikologisches Informationszentrum (STIZ)
	For inquiries outside Switzerland:	+49 6131 19240 (24 h/d) Giftnformationszentrum am Universitätsklinikum Mainz (GIZ)
	Emergency telephone at the company:	+41 55 646 91 11
	Available outside office hours:	No
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 CENTER or doctor/physician. P302/P352: IF ON SKIN: Wash with plenty of water. P261/P304/P340: Avoid breathing dust/spray. 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 and national legislation.

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

2 - 8

2.2.2	Labelling according to Directive 67/548/EEC Indication of danger:	Xi irritant 
	Risk phrases:	R 37: Irritating to respiratory system. R 38: Irritating to skin. R 41: 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 substances. No other hazards identified.

3 Composition/Information on ingredients**3.1 Substances**

Main constituent:	Calcium oxide CAS: 1305-78-8 EINECS: 215-138-9
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.
Following ingestion:	Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Obtain medical attention.

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

Calcium oxide 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 advices given in section 4.1.

5 Fire fighting measures**5.1 Extinguishing media**

5.1.1	Suitable extinguishing media:	The product is not combustible. Use a dry powder, foam or CO ₂ fire extinguisher to extinguish the surrounding fire. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
5.1.2	Unsuitable extinguishing media:	Do not use water. Avoid humidification.
5.2	Special hazards arising from the substance or mixture:	Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.
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:	Keep dust levels to a minimum. Ensure adequate ventilation. Keep unprotected persons away.
-------	------------------------------	--

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

3 - 8

6.1.2	For emergency responders:	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). Avoid humidification. 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). Avoid humidification.
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 rising). Any large spillage into water-courses 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 a 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 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 house-keeping 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**

Occupational exposure standard (OES):	Switzerland: 2 mg/m ³ (E) [MAK/SUVA Grenzwerte am Arbeitsplatz]
SCOEL recommendation (SCOEL/SUM/137 February 2008; see Section 16.6):	
Occupational exposure limit:	OEL (8 h TWA): 1 mg/m ³ respirable dust of calcium oxide
Short term exposure limit:	STEL (15 min): 4 mg/m ³ respirable dust of calcium oxide PNEC aqua = 370 µg/l

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

4 - 8

- 8.2 Exposure controls:** PNEC soil/groundwater = 816 mg/l
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/available via your supplier.
- 8.2.1 Appropriate engineering controls: If user operations generate dusts or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne 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 oxide 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 Environment Agency 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: **White solid**
nekafer[®]: **lumps**
nekafin[®]/**nekasol**[®]: **powder**
- Odour: **Odourless**
- Odour threshold: **Not applicable**
- pH-value: **12.3** for saturated solution of Ca(OH)₂ at 20 °C
- Melting point: **> 450 °C** (study result, EU A.1 method)
- Boiling point: **Not applicable** (solid with a melting point > 450 °C)
- Flash point: **Not applicable** (solid with a melting point > 450 °C)
- Evaporation rate: **Not applicable** (solid with a melting point > 450 °C)
- Flammability: **Not flammable** (study result, EU A.10 method)
- Explosive limits: **Not 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: **3.31 kg/dm³** (study result, EU A.3 method)
- Solubility in water: **1337.6 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)

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

5 - 8

Decomposition temperature:	Not applicable
Viscosity:	Not applicable (solid with a melting point > 450 °C)
Oxidizing 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.)

10	Stability and reactivity	
10.1	Reactivity:	Calcium oxide reacts exothermically with water to form calcium hydroxide.
10.2	Chemical stability:	Under normal conditions of use and storage (dry conditions), calcium oxide is stable.
10.3	Possibility of hazardous reactions:	Calcium oxide reacts exothermically with acids to form calcium salts.
10.4	Conditions to avoid:	Minimise exposure to air and moisture to avoid degradation.
10.5	Incompatible materials:	Calcium oxide reacts exothermically with water to form calcium hydroxide: $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + 1155 \text{ kJ/kg CaO}$ Calcium oxide reacts exothermically with acids to form calcium salts. Calcium oxide reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen: $\text{CaO} + 2 \text{Al} + 7 \text{H}_2\text{O} \rightarrow \text{Ca}[\text{Al}(\text{OH})_4]_2 + 3 \text{H}_2$.
10.6	Hazardous decomposition products:	None. Further information: Calcium oxide absorbs moisture and carbon dioxide from air to form calcium carbonate, which is a common material in nature.

11	Toxicological information	
11.1	Information on toxicological effects	The substance is classified as irritant to skin and respiratory system. There is a risk for serious eye damage.

Toxicity endpoints	Outcome of the effects assessment
Acute toxicity:	Calcium oxide is not acutely toxic. Oral: LD50 > 2000 mg/kg bw (OECD 425, rat) Dermal: LD50 > 2500 mg/kg bw (calcium hydroxide, OECD 402, rabbit); by read across these results are also applicable to calcium oxide, since in contact with moisture calcium hydroxide is formed. Inhalation: No data available
Skin corrosion/irritation:	Calcium oxide is irritating to skin (in vivo, rabbit). Based on experimental results, calcium oxide requires classification as irritating to skin (H315 – Causes skin irritation; R38, irritating to skin).
Serious eye damage/irritation:	Calcium oxide entails a risk of serious damage to the eye (eye irritation studies, in vivo, rabbit). Based on experimental results, calcium oxide requires classification as severely irritating to the eye (H318 - Causes serious eye damage; R41, Risk of serious damage to eye).
Respiratory and skin sensitisation:	Calcium oxide 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.
Germ cell mutagenicity:	CaO is obviously void of any genotoxic potential, including germ cell mutagenicity. Bacterial reverse mutation assay (Ames test, OECD 471): Negative.
Carcinogenicity:	Calcium (administered as Ca-lactate) is not carcinogenic (experimental result, rat). The pH effect of calcium oxide does not give rise to a carcinogenic risk. Human epidemiological data support lack of any carcinogenic potential of calcium oxide.
Reproductive toxicity:	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

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

6 - 8

	toxicity of calcium oxide.
STOT-single exposure:	From human data it is concluded that CaO is irritating to the respiratory tract [STOT SE 3 (H335 – May cause respiratory irritation; R37, Irritating to respiratory system)].
STOT-repeated exposure:	No classification relevant.
Aspiration hazard:	No classification relevant.

12 Ecological information**12.1 Toxicity**

12.1.1	Acute/prolonged toxicity to fish:	LC ₅₀ (96h) for freshwater fish: 50.6 mg/l (calcium hydroxide). LC ₅₀ (96h) for marine water fish: 457 mg/l (calcium hydroxide).
12.1.2	Acute/prolonged toxicity to aquatic invertebrates:	EC ₅₀ (48h) for freshwater invertebrates: 49.1 mg/l (calcium hydroxide). LC ₅₀ (96h) for marine water invertebrates: 158 mg/l (calcium hydroxide).
12.1.3	Acute/prolonged toxicity to aquatic plants:	EC ₅₀ (72h) for freshwater algae: 184.57 mg/l (calcium hydroxide). NOEC (72h) for freshwater algae: 48 mg/l (calcium hydroxide).
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 hydroxide).
12.1.6	Toxicity to soil dwelling organisms:	EC ₁₀ /LC ₁₀ or NOEC for soil macroorganisms: 2000 mg/kg soil dw (calcium hydroxide). EC ₁₀ /LC ₁₀ or NOEC for soil microorganisms: 12000 mg/kg soil dw (calcium hydroxide).
12.1.7	Toxicity to terrestrial plants:	NOEC (21d) for terrestrial plants: 1080 mg/kg (calcium hydroxide).
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.
12.1.9	Further information:	The results by read across are also applicable to calcium oxide, since in contact with moisture calcium hydroxide is formed.
12.2	Persistence and degradability:	Not relevant for inorganic substances.
12.3	Bioaccumulative potential:	Not relevant for inorganic substances.
12.4	Mobility in soils:	Calcium oxide reacts with water and/or carbon dioxide to form respectively calcium hydroxide and/or calcium carbonate, which are sparingly soluble, and so present a low mobility in most ground. Moreover those products are used as fertilisers.
12.5	Results of PBT and vPvB assessment:	Not relevant for inorganic substances.
12.6	Other adverse effects:	No other effects were identified.

13 Disposal considerations

13.1	Waste treatment methods:	Disposal of calcium oxide 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 federal, state and local requirements. The used packing is only meant for packing this product. After usage, empty the packing completely. 06 02 01
	VeVA code:	

14 Transport information:

		Calcium oxide is not classified as hazardous for transport [ADR (Road), RID (Rail), IMDG/ GGVSea (Sea)].
14.1	UN Number:	UN 1910
14.2	UN proper shipping name:	Calcium oxide
14.3	Transport hazard class(es):	Class 8 Calcium oxide is listed in IMDG (Amendment 34-08).
14.4	Packing group:	Group III (Air transport, ICAO/IATA).
14.5	Environmental hazards:	None.
14.6	Special precautions for use:	Avoid any release of dust during transportation, by using 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.

Calcium oxide: **nekafer**[®] / **nekafin**[®] / **nekasol**[®]

7 - 8

15	Regulatory information	
15.1	Safety, health and environmental regulations/legislation specific for the substance	<p>Authorisations: Not required. Restrictions on use: None. Other EU regulations: Calcium oxide is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant. National regulations: Water endangering class 1 (Germany).</p>
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:	<p>H315: Causes skin irritation. H318: Causes serious eye damage. H335: May cause respiratory irritation.</p>
16.2	Precautionary statements:	<p>P102: Keep out of reach of children. P280: Wear protective gloves/protective clothing/eye protection/face protection. P305/0351: IF IN EYES: Rinse cautiously with water for several minutes. P310: Immediately call a POISON CENTER 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 and national legislation.</p>
16.3	Risk phrases:	<p>R 37: Irritating to respiratory system. R 38: Irritating to skin. R 41: Risk of serious damage to eyes.</p>
16.4	Safety phrases	<p>S 2: Keep out of reach of children. S 25: Avoid contact with eyes. S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 37: Wear suitable gloves. S 39: Wear eye/face protection.</p>
16.5	Abbreviations:	<p>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. STEL: Short-term exposure limit. TWA: Time weighted average. vPvB: Very persistent, very bioaccumulative chemical.</p>
16.6	Key literature references:	<p>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 2008.</p>
16.7	Revision:	This safety data sheet is a renewed version in order to be in accordance with annex II of the REACH directive (EG) No 1907/2006, regulation (EC) 1272/2008 and regulation (EC) 453/2010.
16.8	Disclaimer:	<p>Version December 2010 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</p>

Calcium oxide: **nekafer® / nekafin® / nekasol®** **8 - 8**

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.

Annex:

Exposure scenarios.



End of the safety data sheet.