

Product Safety Data Sheet

Created: September 1, 2006

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1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Name of chemical: Quicklime (Calcium Oxide)

Company Name: Takunan Seitetsu Co., Ltd.
Address: 3-26 Kaiho-cho, Okinawa-shi, Okinawa-ken
Phone: 098-934-6811 Fax: 098-934-6833

Manufacturer: Nago Lime Factory
Address: 2656-2 Awa, Nago-shi, Okinawa-ken
Phone: 0980-53-8018

2. SUMMARY OF HAZARDOUS SUITABLETIES

GHS Classification

Physical/chemical hazards explosive classification:	outside classification parameters
Combustible/Flammable gas classification:	outside classification parameters
Combustible/Flammable aerosol classification:	outside classification parameters
Burnable/Oxidizing gas classification:	outside classification parameters
High pressure gas classification:	outside classification parameters
Flammable liquid classification:	outside classification parameters
Combustible solid:	outside subcategory parameters
Self-reactive chemical article classification:	outside classification parameters
Pyrophoric liquid classification:	outside classification parameters
Pyrophoric solid:	outside subcategory parameters
Pyrogenic chemical agent:	outside subcategory parameters
Substances which in contact with water emits flammable gases:	outside subcategory parameters
Oxidizing liquids classification:	outside classification parameters
Oxidizing solid:	unclassifiable
Organic peroxide classification:	outside classification parameters
Metallic corrosive materials:	unclassifiable
Health hazard acute toxicity (oral):	subcategory 5
Acute toxicity (transdermal):	unclassifiable
Acute toxicity (inhalation: gas) classification:	outside classification parameters
Acute toxicity (inhalation: steam):	unclassifiable
Acute toxicity (inhalation: powder dust):	unclassifiable
Acute toxicity (inhalation: mist) class:	outside classification parameters
Skin corrosivity/irritation:	subcategory 1C
Serious eye damage /irritation:	subcategory 1
Respiratory sensitization:	unclassifiable
Skin sensitization:	outside subcategory parameters
Burnable/Oxidizing Specific target organs/systemic toxicity (single exposure):	subcategory 1 (respiratory system) subcategory 2 (systemic toxicity, digestive organs)
Specific target organs/systemic toxicity (repeated exposure):	subcategory 1 (respiratory system)
Respiratory toxicity from aspiration:	subcategory 1
Environmental toxicity/Acute toxicity to aquatic environment:	outside subcategory parameters

Chronic toxicity to aquatic environment:
Label Elements

outside subcategory parameters

Pictorial indications or symbols:



Warning statement: Danger

Hazard and toxicity information: Risk of hazardous effects if swallowed (oral)

Serious chemical scarring or eye damage

Serious eye damage

Respiratory damage

Risk of systemic toxicity, or digestive organ damage

Risk of respiratory system damage due to long-term or repeated exposure

Risk of danger to life if inhaled into respiratory tract

Cautionary Statements

[Safety Measures]

Do not eat, drink, or smoke while handling this product.

Wear protective gloves, protective clothing, and protective glasses and face guard.

Do not inhale dust from the product.

Wash hands thoroughly after handling.

[First Aid]

If product is swallowed, do not induce vomiting forcibly.

If product is inhaled move the affected person to a place with fresh air, and let the person rest in a position where he/she can breathe easily.

If ingested: Rinse mouth out with water. Do not induce vomiting forcibly.

In case of contact with eyes: Wash eyes thoroughly and carefully for a number of minutes. If wearing contact lenses, remove them if possible and continue washing.

If product adheres to skin, wash with plenty of water and soap.

If product adheres to clothing, immediately take off or remove contaminated clothing.

Laundry contaminated clothing before reuse.

If one has been exposed to the product or there are concerns thereof, contact a physician for an examination and treatment.

If ingested: immediately see a physician for an examination and treatment.

Contact with eyes: immediately see a physician for an examination and treatment.

If feeling sick, undergo an examination and treatment by a physician.

If inhaled: immediately see a physician for an examination and treatment.

[Storage]

Store in a locked area.

[Disposal]

Consign contents and containers to prefectural or city government certified industrial waste management specialists.

3. COMPOSITION AND COMPONENT INFORMATION

Chemical Material

Chemical name or standard name: Calcium Oxide (calcium oxide)

Synonyms: Quicklime, Lime

Chemical formula: CaO

CAS number: 1305-78-8

Reference number in Official Gazette list in Japan (Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture/Industrial Safety and Health Act): (1)-189
Impurities and stabilizing additives contributing to classification: No information
Concentration or concentration range: 93% or greater

4. FIRST AID

INHALATION: Move the affected person to a place with fresh air and let the person rest in a position where he/she can breathe easily.

If feeling sick, undergo treatment and an examination from a physician.

SKIN ADHERANCE: Immediately take off or remove all contaminated clothing.

Wash skin with running water or in a shower.

Immediately contact a physician.

Launder contaminated clothing before reuse.

EYE CONTACT: Rinse carefully with water for several minutes. Then, if wearing contact lenses, remove if readily possible. Then continue to rinse.

Contact a physician immediately.

INGESTION: Rinse mouth right away. Immediately undergo treatment and examination from a physician.

Anticipated acute symptoms and delayed symptoms: Inhalation: burning sensation, coughing, sense of breathlessness, sore throat and headache.

SKIN CONTACT: Dryness of skin, reddening, burning skin injury, pain.

EYE CONTACT: Reddening, pain, blurred vision, severe chemical scarring.

Ingestion: Burning sensation, abdominal pain, stomach cramps, vomiting, diarrhea.

Most important indications and symptoms:

Protection for first aid personnel: first aid personnel should wear appropriate protective gear suitable to the situation.

Precautionary items of note for the physician: complete rest and medical observation is absolutely necessary.

The calcium oxide clay particles that have formed by reacting to the liquid and proteins in the eye are very difficult to remove by washing the eyes with water. Hand-removal by a physician is required.

5. FIRE MEASURES

Fire extinguishing agents: Minor fires: Carbon dioxide, powder extinguishing agents, dry sand, alcohol-resistant foam extinguishing agent.

Major fires: Water sprinklers, mist spray, alcohol-resistant foam extinguishing agents.

Specific toxicity: Irritation, toxicity, or corrosive or toxic gases, and fumes may be produced from a fire.

Although the product is non-combustible and the product itself will not burn, there is a risk that it will decompose and generate corrosive or toxic fumes when heated.

The containers may explode from heating or contamination by water.

Specific extinguishing method: Move containers from fire area if not too dangerous.

If a small amount, cover with dry sand and extinguish by suffocating the fire.

Do not pour water into containers.

Protection for person extinguishing fire: When extinguishing, use suitable air respirators in addition to suitable clothing that protects from chemicals.

6. LEAKAGE MEASURES

Precautions for the body, protective gear, and emergency measures: Immediately secure suitable distance in all directions from the leakage area and close it off.

Restrict entrance of non-authorized personnel.

When not wearing suitable clothing do not touch damaged containers or leaked product.

Workers should wear suitable protective gear (refer to “8. Exposure Prevention and Protection Measures”) and avoid product contact with eyes and skin and inhalation of dust or mist.

Stay upwind from product.

Ventilate sealed spaces before entering.

Environmental precautions: Take precautions to prevent runoff of the product from entering the natural water system and affecting the environment.

Collection and neutralization: Sweep spilled material into dry containers.

Containment and clean-up methods/equipment: Stop leakage if not dangerous.

Avoid generating dust and dispersion of material.

Secondary disaster prevention measures: Immediately remove all sources of fire and combustible substances. (Do not allow smoking and use of fireworks or flames in proximity).

Prevent the material from flowing into drains, sewers, basements or closed spaces.

7. PRECAUTIONS FOR HANDLING AND STORAGE

Handling

Technical measures: Establish facility measures listed in “8. Exposure Prevention and Protection Measures” and wear protective gear.

Local exhaust ventilation/general ventilation: Establish local exhaust ventilation and overall ventilation listed in “8. Exposure Prevention and Protection Measures”.

Precautions for safe handling: Do not eat, drink, or smoke while handling this product.

Use product only in well-ventilated areas or outdoors.

Handle product with care so as to avoid generating dust.

Do not contact, inhale, or ingest product.

Do not allow product to come in contact with eyes, or skin. Do not allow product into the eyes.

Use exhaust ventilation to maintain the concentration levels of the air under exposure limits.

Wash hands thoroughly after handling product.

Avoiding contact: Refer to “10. Stability and Reactivity”

Storage

Technical measures: Prepare a storage facility with fire resistant walls, pillars and flooring, and with non-combustible beams.

The floor of the storage area must be water tight and moisture impermeable.

To store and handle hazardous materials, prepare a storage facility that has outside light or inside lighting, and ventilation.

Hazardous contaminants: Refer to “10. Stability and Reactivity”

Storage conditions: Store containers, sealed, in a cool dry storage area.

Store product away from sources of fire such as heat, fireworks, open flames. No smoking in area of product.

Store in a locked space.

Packaging of containers: Use containers specified by the U.N. transportation laws.

8. EXPOSURE PREVENTION AND PROTECTIVE MEASURES

Managed concentration levels: Not specified

Allowable concentration levels: (Exposure limit values, biological exposure index):

Japan Society of Occupational Health (2005) Not specified

ACGIH (2005) TLV-TWA 2mg/m³

Facility measures: Incorporate such measures as sealing off the production process area, local ventilation, and other measures to maintain the concentration levels of the air under allowable limits.

Install eye washing equipment and safety showers in storage and work areas.

Protective Gear

Respiratory protective gear: Wear suitable respiratory protective gear.

Protective gear for the hands: Wear suitable protective gloves.

Nitrile or vinyl protective wear is not considered suitable protective gear. Neoprene is recommended.

Protective gear for the eyes: Wear suitable eye protective gear. (safety goggles, and face shielding, etc.)

Protective gear for the skin and body: Wear face protection, protective clothing, safety shoes, etc.

Health measures: Do not eat, drink, or smoke while handling this product.

Wash hands thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physicality: Form, color etc.: White to gray-colored crystalized powder^{1) 2)}

Odor: Odorless⁸⁾

pH: No data

Melting/congealing point: 2570°C⁴⁾ 2614°C⁶⁾ 2572°C¹⁾

Boiling point, initial boiling point and boiling range: 2850°C^{4), 6)}

Flash point: Incombustible

Explosion range: No data

Vapor pressure: No data

Vapor density (Air = 1): No data

Specific gravity (Density): 3.3-3.4⁴⁾, 3.37⁶⁾, 3.32-3.35¹⁾

Solubility: Reacts with water⁴⁾ 1g/840mL of water.⁸⁾

Octanol/water partition coefficient: No data

Spontaneous combustion temperature: Non-combustible

Decomposition temperature: No data

Odor threshold value: No data

Evaporation speed (butyl acetate = 1): Not applicable

Flammability (solid, gas): Non-combustible

Viscosity: No data

10. STABILITY AND REACTIVITY

Stability: Absorbs moisture and carbon dioxide from the atmosphere and generates calcium hydrate and calcium carbonate. When product is piled in large quantities, its temperature will rise to around 300°C due to humidity.

Hazardous reaction possibility: Reacts to water, and will generate sufficient heat to ignite combustible substances.

Strongly reacts with acid, halogens and metals.

Will ignite if comes in contact with sulfur or hydrogen pentafluoride.

Will generate heat if comes in contact with hydrochloric acid.

Conditions to be avoided: Contact with water, acids, combustible substances, and metals.

Hazardous contaminants: acids, halogens, metals.

Hazardous decomposition substances: None

11. TOXICOLOGICAL INFORMATION

Acute toxicity: Oral: mice LD50 3059mg/kg ³⁾

Harmful if swallowed (subcategory 5)

Skin corrosivity/irritation: Corrosive to skin. ⁴⁾ Sever irritation to moist skin. ¹⁰⁾

U.N. classification class 8, III.

Severe chemical skin scarring and eye damage: (Subcategory 1C)

Severe eye damage/irritation: Classified as subcategory 1 due to being classified as subcategory 1C by GHS classification based on indications of corrosiveness to eyes⁴⁾ and skin corrosivity/irritation.

Severe damage to eyes.

Respiratory sensitization or skin sensitization: Respiratory sensitization: No data

Skin sensitization: Classified as outside classification parameters based on negative outcomes in human testing.

Germ-cell mutagenicity: Negative outcomes from mitotic recombinant tests with saccharomycetes, negative outcomes in Ames tests⁷⁾ and no data for in vivo testing. Cannot be classified.

Carcinogenicity: No data

Genotoxicity: Indications of having no effects in first generation tests in rats and mice⁷⁾. However, cannot be classified due to insufficient data.

Specific target organs/systemic toxicity

(Single exposure): Based on indication of causing inflammation of respiratory tract from inhalation of dust¹⁰⁾, and pneumonia⁸⁾, classified as subcategory 1 (respiratory system); will go into shock if accidentally swallowed whereby causing an increased pulse rate, weakened pulse, increased breathing, shallow breathing, decreased body temperature, and experience difficulty breathing from glottal tumors. Although there are indications of causing esophageal and abdominal perforations⁸⁾, this has been classified as subcategory 2 (systemic toxicity, digestive organs) because it is Priority 2.

Damage to respiratory system.

Risk of systemic toxicity and harmful to digestive organs.

Specific target organs/systemic toxicity

(Repeated exposure): Classified as subcategory 1 (respiratory system) due to indications of ulcerations or perforations in the nasal septum ⁴⁾.

Damage to respiratory system due to long-term or repeated exposure.

Respiratory toxicity from aspiration: There are reports of aspiration pneumonitis in humans. ⁸⁾

Risk to life if swallowed or inhaled into esophagus (subcategory 1).

12. ENVIRONMENTAL IMPACT INFORMATION

Acute hazard level to aquatic environment: Classified as outside classification parameters based on 96 hour LC50= 1070mg/L⁷⁾ in fish (carp).

Chronic hazard level to aquatic environment: Classified as outside classification parameters because it does not have poor water solubility (water solubility = 1200mg/L²¹⁾, and it has low acute toxicity.

13. DISPOSAL PRECAUTIONS:

Disposal of residual product: Dispose in accordance with pertinent regulations and local municipal standards.

Dispose of using a prefectural or city government certified industrial waste disposal company. If disposal services are offered by local public organizations, consign with such organizations undertaking such services.

Cast small amounts at a time into large amounts of water because of the risk of generating heat from the neutralization process; neutralize this with diluted sulfuric acid to dispose in the form of hydrated lime.

Contaminated containers and packaging: Containers can be cleaned and recycled or disposed in accordance with pertinent regulations or local municipality standards.

When disposing of empty containers, eliminate all contents completely.

14. PRECAUTIONS FOR TRANSPORTATION

International regulations

Marine transport regulations

Air transport regulations Comply with ICAO/IATA

U.N. No.: 1910

Proper Shipping Name: Calcium oxide

Class: 8

Secondary Risk:

Packing Group: III

Domestic regulations

No particular land transport regulations

No particular marine transport regulations

Comply with air transport regulations

U.N. No.: 1910

Proper Shipping Name: Calcium oxide

Class: 8

SubRisk:

Packing Group: III

Regarding special safety measures for transportation, avoid direct sunlight, carefully load product to avoid breaking, corrosion or leakage of containers, and ensure that the load will not collapse.

Do not transport product with food or fodder.

Do not load any heavy load on top of this product.

15. APPLICABLE LAWS AND REGULATIONS

Industrial Safety and Health Law: A Hazardous material requiring notification (Article 57-2, Enforcement order 18-2 attached table No. 9) (Government ordinance number 190)

Fire Service Act: A substance that requires registration of storage (Article 9-3 / Hazardous material regulation 1-10)

Civil Aeronautics Act: Corrosive material (Hazardous Materials Disclosure Table 1 of Article 194 in the Enforcement Regulations)

16. OTHER INFORMATION

References

1) Merck (13th, 2001)

2) Sax (11th, 2004)

3) RTECS (2004)

4) ICSC (1997)

5) Weiss (2nd, 1985)

6) NFPA (13th, 2002)

7) IUCLID (2000)

- 8) HSDB (2005)
- 9) Hommel (1991)
- 10) ACGIH (2001)
- 11) Handbook of Hazardous and Toxic Chemical Substances; Japan Industrial Safety and Health Association (1992)
- 12) Classification and standards for carcinogenic substances; 6th Edition, Japan Chemical Industry Ecology · Toxicology & Information Center (2004)
- 14) GHS classification results (Japan Chemical Industry Association G)
- 15) Japan Chemical Industry Association “First Aid Policies for Emergencies and Yellow-card Containers (labeling methods)”
- 16) Japan Chemical Industry Association “Chemical Regulations Search System for Chemical Substances” (CD-ROM) (2005)
- 17) Japan Chemical Database (Co., Ltd.) “Comprehensive Chemical Database” (2005)
- 18) Safety DB (Revised and expanded edition, 1997)
- 19) JETOC “Compilation of Safety Test Data for Existing Chemical Substances of the Act on the Evaluation of Chemical Substances and Regulation of Their Manufactures
- 20) Ministry of the Environment “Biological Effects of Chemical Substances Project”
- 21) HSDB (2004)

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