

Calcium hydroxide

sc-211001

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

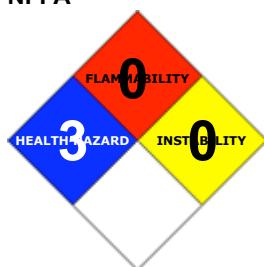
PRODUCT NAME

Calcium hydroxide

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Company: Santa Cruz Biotechnology, Inc.

Address:

2145 Delaware Ave

Santa Cruz, CA 95060

Telephone: 800.457.3801 or 831.457.3800

Emergency Tel: CHEMWATCH: From within the US and Canada:

877-715-9305

Emergency Tel: From outside the US and Canada: +800 2436 2255

(1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE

Laboratory reagent. A large volume industrial chemical. Manufacture of calcium salts. A binder in mortar, plaster, cement and in building and paving materials. A component in drilling muds, pesticides, fireproof coatings, water paints. As an acid neutralizing agent in water and sewage treatment. Disinfectant. As a flux in steel production; in manufacture of paper pulp. Depilatory, dehairing hides. Poultry food additive - shell forming agent. In purification of sugar.

SYNONYMS

Ca-H₂O₂, Ca(OH)₂, "calcium hydrate", "caustic lime", "hydrated lime", "slaked lime", "lime water", "milk of lime", "limbux lime", setelime, kemikal, "lime hydrated", hydrolime, 27599

Section 2 - HAZARDS IDENTIFICATION

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Causes burns.

Risk of serious damage to eyes.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.
- The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality (death) rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

EYE

- The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating.
- If applied to the eyes, this material causes severe eye damage.
- Eye contact with calcium hydroxide may result in severe irritation and pain. The material may induce ulcerations of the corneal epithelium.

SKIN

- The material can produce chemical burns following direct contact with the skin.
- Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.
- In the presence of moisture calcium hydroxide (slaked lime) is a caustic irritant and can be damaging to human tissue. Skin contact may result in severe burns and blistering, depending on duration of contact.
- Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Solution of material in moisture on the skin, or perspiration, may markedly increase skin corrosion and accelerate tissue destruction.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- If inhaled, this material can irritate the throat and lungs of some persons.
- Minor exposures / slow dissolution of calcium hydroxide, in body fluids in the upper respiratory tract and lungs may produce delayed severe irritation or burning sensation. Severe acute dust inhalation may produce laryngitis and pulmonary oedema.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane. In severe cases, lung swelling may develop, sometimes after a delay of hours to days. There may be low blood pressure, a weak and rapid pulse, and crackling sounds.

CHRONIC HEALTH EFFECTS






- Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Chronic exposure to calcium hydroxide may result in narrowing of the esophagus, with difficulty in swallowing. This may happen after weeks, months or years of exposure.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

HAZARD RATINGS

| | | Min | Max |
|---------------|---|---|-----|
| Flammability: | 0 |  | |
| Toxicity: | 0 |  | |
| Body Contact: | 3 |  | |
| Reactivity: | 0 |  | |
| Chronic: | 2 |  | |

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



| NAME | CAS RN | % |
|-------------------|-----------|-----|
| calcium hydroxide | 1305-62-0 | >95 |

Section 4 - FIRST AID MEASURES

SWALLOWED

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- For advice, contact a Poisons Information Center or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

EYE

- If this product comes in contact with the eyes:
 - Immediately hold eyelids apart and flush the eye continuously with running water.
 - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
 - Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
 - Transport to hospital or doctor without delay.
 - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin or hair contact occurs:
 - Immediately flush body and clothes with large amounts of water, using safety shower if available.
 - Quickly remove all contaminated clothing, including footwear.
 - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
 - Transport to hospital, or doctor.

INHALED

- - If fumes or combustion products are inhaled remove from contaminated area.
 - Lay patient down. Keep warm and rested.
 - Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
 - Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
 - Transport to hospital, or doctor.

Inhalation of vapors or aerosols (mists, fumes) may cause lung edema. Corrosive substances may cause lung damage (e.g. lung edema, fluid in the lungs). As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested. Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered. This must definitely be left to a doctor or person authorized by him/her. (ICSC13719).

NOTES TO PHYSICIAN

- Treat symptomatically.

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilization of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.

- Neutralizing agents should never be given since exothermic heat reaction may compound injury.

* Catharsis and emesis are absolutely contra-indicated.

* Activated charcoal does not absorb alkali.

* Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.
- Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

Section 5 - FIRE FIGHTING MEASURES

| | |
|----------------------------|----------------|
| Vapour Pressure (mmHG): | Negligible |
| Upper Explosive Limit (%): | Not applicable |

| | |
|-----------------------------|----------------|
| Specific Gravity (water=1): | 2.2-2.3 |
| Lower Explosive Limit (%): | Not applicable |

EXTINGUISHING MEDIA

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- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

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- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

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- Non combustible.
- Not considered to be a significant fire risk, however containers may burn.

May emit corrosive fumes.

FIRE INCOMPATIBILITY

• None known.

PERSONAL PROTECTION

Glasses:

Chemical goggles.

Full face- shield.

Gloves:

1.NATURAL RUBBER

Respirator:

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

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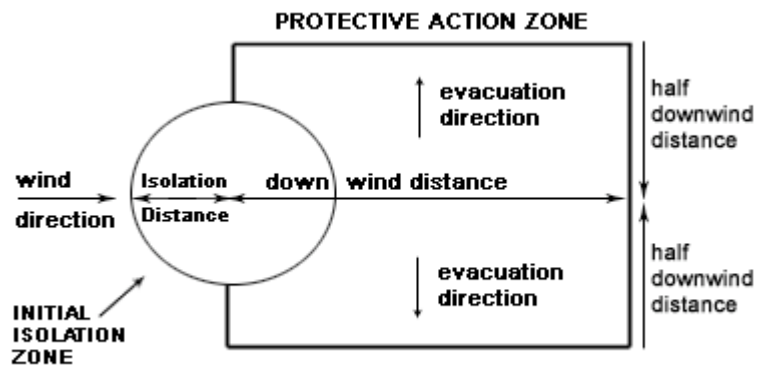
- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

MAJOR SPILLS

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- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL



From IERG (Canada/Australia)

Isolation Distance 25 meters

Downwind Protection Distance 250 meters

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 154 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

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- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

RECOMMENDED STORAGE METHODS

- DO NOT use aluminum or galvanized containers.
- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges may be used.

- Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic.

STORAGE REQUIREMENTS

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- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

- Protect containers against physical damage and check regularly for leaks.
 - Observe manufacturer's storing and handling recommendations.
- DO NOT store near acids, or oxidizing agents.
- No smoking, naked lights, heat or ignition sources.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together

O: May be stored together with specific precautions

+: May be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

| Source | Material | TWA ppm | TWA mg/m ³ | STEL ppm | STEL mg/m ³ | Peak ppm | Peak mg/m ³ | TWA F/CC | Notes |
|---|---|------------|--------------------------|-------------|---------------------------|-------------|---------------------------|-------------|---|
| Canada - British Columbia Occupational Exposure Limits | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| Canada - Ontario Occupational Exposure Limits | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| US - Minnesota Permissible Exposure Limits (PELs) | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| Canada - Alberta Occupational Exposure Limits | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| US OSHA Permissible Exposure Levels (PELs) - Table Z1 | calcium hydroxide (Calcium hydroxide - Respirable fraction) | | 5 | | | | | | |
| US ACGIH Threshold Limit Values (TLV) | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | TLV Basis: eye, upper respiratory tract & skin irritation |
| US NIOSH Recommended Exposure Limits (RELs) | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants | calcium hydroxide (Calcium hydroxide - Respirable fraction) | | 5 | | | | | | |
| US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants | calcium hydroxide (Calcium hydroxide - Total dust) | | 15 | | | | | | |
| US - California Permissible Exposure Limits for Chemical Contaminants | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |
| US - Idaho - Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide - Total dust) | | 15 | | | | | | |
| US - Idaho - Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide - Respirable fraction) | | 5 | | | | | | |
| US OSHA Permissible Exposure Levels (PELs) - Table Z1 | calcium hydroxide (Calcium hydroxide - Total dust) | | 15 | | | | | | |
| US - Alaska Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide) | | 5 | | | | | | |

| | | | | | |
|---|---|----|---|---|---|
| US - Michigan Exposure Limits for Air Contaminants | calcium hydroxide | 5 | | | |
| US - Oregon Permissible Exposure Limits (Z1) | calcium hydroxide (Calcium hydroxide Total Dust) | 10 | | | * |
| US - Hawaii Air Contaminant Limits | calcium hydroxide (Calcium hydroxide) | 5 | | | |
| Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances | calcium hydroxide (Calcium hydroxide) | - | 5 | - | 10 |
| US - Washington Permissible exposure limits of air contaminants | calcium hydroxide (Calcium hydroxide) | 5 | | | 10 |
| Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits | calcium hydroxide (Calcium hydroxide) | 5 | | | 10 |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide- Total dust) | 15 | | | |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | calcium hydroxide (Calcium hydroxide - Respirable fraction) | 5 | | | |
| Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English) | calcium hydroxide (Calcium hydroxide) | 5 | | | |
| Canada - Prince Edward Island Occupational Exposure Limits | calcium hydroxide (Calcium hydroxide) | 5 | | | TLV Basis: eye, upper respiratory tract & skin irritation |
| US - Oregon Permissible Exposure Limits (Z1) | calcium hydroxide (Calcium hydroxide Respirable Fraction) | 5 | | | * |
| Canada - Northwest Territories Occupational Exposure Limits (English) | calcium hydroxide (Calcium hydroxide) | 5 | | | 10 |
| Canada - Nova Scotia Occupational Exposure Limits | calcium hydroxide (Calcium hydroxide) | 5 | | | TLV Basis: eye, upper respiratory tract & skin irritation |

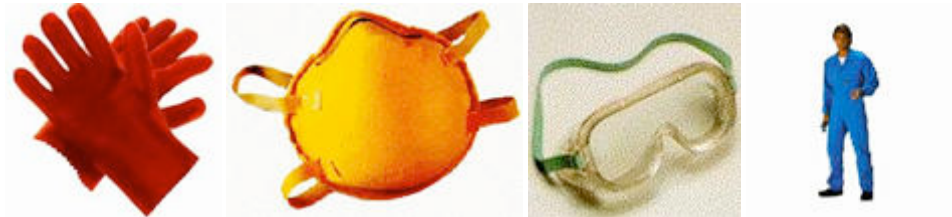
MATERIAL DATA

CALCIUM HYDROXIDE:

• For calcium hydroxide:

In the absence of reports of adverse effects from exposure and the recognised lesser alkalinity of the alkaline earths compared with the the alkali hydroxides the relatively high value of TLV-TWA is recommended. This value corresponds in total alkalinity to 5 mg/m³ of sodium hydroxide or 2.5 times the TLV-TWA of sodium hydroxide.

PERSONAL PROTECTION



Consult your EHS staff for recommendations

EYE

-
- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,

- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

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- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.
-
- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory . These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

GLOVE SELECTION INDEX

- Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection: calcium hydroxide

- Protective Material CPI *

| | |
|------------------|---|
| NATURAL RUBBER | A |
| NATURAL+NEOPRENE | A |

- * CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

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- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Such protection might consist of:

- (a): particle dust respirators, if necessary, combined with an absorption cartridge;
- (b): filter respirators with absorption cartridge or canister of the right type;
- (c): fresh-air hoods or masks

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

| | |
|----------------------|------------|
| Type of Contaminant: | Air Speed: |
|----------------------|------------|

direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) 1-2.5 m/s (200-500 f/min.)

grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). 2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

| Lower end of the range | Upper end of the range |
|--|----------------------------------|
| 1: Room air currents minimal or favorable to capture | 1: Disturbing room air currents |
| 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity |
| 3: Intermittent, low production. | 3: High production, heavy use |
| 4: Large hood or large air mass in motion | 4: Small hood-local control only |

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Does not mix with water.
Sinks in water.
Corrosive.
Alkaline.

| | | | |
|---------------------------|--------------------------|--------------------------------|------------------|
| State | DIVIDED SOLID | Molecular Weight | 74.10 |
| Melting Range (°F) | 1076 (-H ₂ O) | Viscosity | Not Applicable |
| Boiling Range (°F) | Decomposes. | Solubility in water (g/L) | Partly miscible |
| Flash Point (°F) | Not applicable | pH (1% solution) | 12.4 (saturated) |
| Decomposition Temp (°F) | 1076 | pH (as supplied) | Not applicable |
| Autoignition Temp (°F) | Not applicable | Vapour Pressure (mmHG) | Negligible |
| Upper Explosive Limit (%) | Not applicable | Specific Gravity (water=1) | 2.2-2.3 |
| Lower Explosive Limit (%) | Not applicable | Relative Vapor Density (air=1) | Not applicable. |
| Volatile Component (%vol) | Negligible | Evaporation Rate | Not Applicable |

APPEARANCE

White or off white amorphous odourless powder with bitter, alkaline taste; slightly soluble in water and insoluble in alcohol. Readily absorbs carbon dioxide from the air to form calcium carbonate; and loses water when heated strongly to form calcium oxide. Soluble in glycerol, sugar or ammonium chloride solutions. Soluble in acids with evolution of heat. Bulk density: 400-500 kg/m³. Grades available: Builders Lime, technical, Pure, BP sterilised.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

-
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

- Calcium hydroxide
- produces explosive decomposition on contact with maleic anhydride
- may form explosive compounds or explode on contact with ammonium salts, phosphorus, nitroethane, nitromethane, nitroparaffins or nitropropane; salts may be shock-sensitive
- is incompatible with acids
- attacks some metals and coatings
- forms salts with nitroparaffins in the presence of water which are explosive when dried.

Reacts with aluminium / zinc producing flammable, explosive hydrogen gas.

Avoid strong acids.

- Avoid contact with copper, aluminium and their alloys.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

calcium hydroxide

TOXICITY AND IRRITATION

• unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

| TOXICITY | IRRITATION |
|--|------------------------------|
| Oral (rat) LD50: 7340 mg/kg | Eye (rabbit): 10 mg - SEVERE |
| • The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. | |

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

CALCIUM HYDROXIDE:

| | |
|---|-----|
| • Fish LC50 (96hr.) (mg/l): | 160 |
| • Prevent, by any means available, spillage from entering drains or watercourses. | |
| • DO NOT discharge into sewer or waterways. | |

Ecotoxicity

| Ingredient | Persistence: Water/Soil | Persistence: Air | Bioaccumulation | Mobility |
|-------------------|-------------------------|------------------|-----------------|----------|
| calcium hydroxide | | | LOW | |

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information

Corrosivity characteristic: use EPA hazardous waste number D002 (waste code C)

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

• Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralize at an approved treatment plant.
- Treatment should involve: Mixing or slurring in water Neutralization with suitable dilute acid followed by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material).
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION



DOT:

| | | | |
|--|--------|--|--------------------|
| Symbols: | None | Hazard class or Division: | 8 |
| Identification Numbers: | UN3262 | PG: | III |
| Label Codes: | 8 | Special provisions: | IB8, IP3, T1, TP33 |
| Packaging: Exceptions: | 154 | Packaging: Non-bulk: | 213 |
| Packaging: Exceptions: | 154 | Quantity limitations: Passenger aircraft/rail: | 25 kg |
| Quantity Limitations: Cargo aircraft only: | 100 kg | Vessel stowage: Location: | A |
| Vessel stowage: Other: | 52 | | |

Hazardous materials descriptions and proper shipping names:

Corrosive solid, basic, inorganic, n.o.s.

Air Transport IATA:

| | | | |
|---------------------|------|--------------------|------|
| ICAO/IATA Class: | 8 | ICAO/IATA Subrisk: | None |
| UN/ID Number: | 3262 | Packing Group: | III |
| Special provisions: | A3 | | |

Shipping Name: CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. *(CONTAINS CALCIUM HYDROXIDE)

Maritime Transport IMDG:

| | | | |
|-------------|---------|---------------------|-------------|
| IMDG Class: | 8 | IMDG Subrisk: | None |
| UN Number: | 3262 | Packing Group: | III |
| EMS Number: | F-A,S-B | Special provisions: | 223 274 944 |

Limited Quantities: 5 kg

Shipping Name: CORROSIVE SOLID, BASIC, INORGANIC, N.O.S.(contains calcium hydroxide)

Section 15 - REGULATORY INFORMATION

calcium hydroxide (CAS: 1305-62-0,1332-69-0) is found on the following regulatory lists;

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Northwest Territories Occupational Exposure Limits (English)","Canada - Nova Scotia Occupational Exposure Limits","Canada - Ontario Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Industrial Hazardous Substances","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)","CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Council of Chemical Associations (ICCA) - High Production Volume List","OECD Representative List of High Production Volume (HPV) Chemicals","US - Alaska Limits for Air Contaminants","US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List","US - California Permissible Exposure Limits for Chemical Contaminants","US - Connecticut Hazardous Air Pollutants","US - Hawaii Air Contaminant Limits","US - Idaho - Limits for Air Contaminants","US - Michigan Exposure Limits for Air Contaminants","US - Minnesota Hazardous Substance List","US - Minnesota Permissible Exposure Limits (PELs)","US - New Jersey Right to Know Hazardous Substances","US - Oregon Permissible Exposure Limits (Z1)","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List","US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants","US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants","US - Washington Permissible exposure limits of air contaminants","US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants","US ACGIH Threshold Limit Values (TLV)","US DOE Temporary Emergency Exposure Limits (TEELs)","US Food Additive Database","US NIOSH Recommended Exposure Limits (RELs)","US OSHA Permissible Exposure Levels (PELs) - Table Z1","US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

• Cumulative effects may result following exposure*.

* (limited evidence).

Ingredients with multiple CAS Nos

Ingredient Name
calcium hydroxide

CAS
1305-62-0, 1332-69-0

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- Classification of the mixture and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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