

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Calcium hydroxide (MSDS No. P-4786-F)	Trade Names: Carbide Lime
Chemical Name: Calcium hydroxide	Synonyms: Activated lime, bell mine, calcium hydrate, carbide lime, generator slurry, hydrated lime, lime cake, lime hydrate, lime sludge, lime slurry, lime water, slaked lime, whitewash
Chemical Family: Metal hydroxide	Product Grades: None assigned.
Telephone: Emergencies: 1-800-645-4633* CHEMTREC: 1-800-424-9300* Routine: 1-800-PRAXAIR	Company Name: Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Hazards Identification

EMERGENCY OVERVIEW

**WARNING! Nonflammable solid particulates in water suspension.
May cause eye, skin, and respiratory tract irritation and burns.
Self-contained breathing apparatus and protective clothing
may be worn by rescue workers.
Under ambient conditions, this solid has a slight to strong ammonia-like odor.**

OSHA REGULATORY STATUS: The components of this mixture are considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

Effects of a Single (Acute) Overexposure

Inhalation. Irritates the eyes and respiratory tract, producing nausea, vomiting, cough, excess sputum, and chest discomfort. May cause pulmonary edema.

Skin Contact. Lime in slurry form will not affect the skin immediately on contact. Prolonged contact with lime may cause skin lesions that normally heal within 5 to 7 days.

Swallowing. May burn the mouth, throat, and esophagus producing abdominal and chest discomfort. Nausea, vomiting, diarrhea, weakness, faintness, dizziness, drowsiness, and coma may follow.

Eye Contact. May severely irritate eye tissue, producing pain, excess tearing, conjunctival edema and hemorrhage, corneal edema, and opacification.

Effects of Repeated (Chronic) Overexposure. None known.

Other Effects of Overexposure. None known.

Medical Conditions Aggravated by Overexposure. Inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Because of its irritating properties, this material may aggravate an existing dermatitis.

CARCINOGENICITY: None of the components of this product is listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None known. For further information, see section 12, Ecological Information.

3. Composition/Information on Ingredients

Carbide lime is normally mixed with water (CAS 7732-18-5). The information in this section is for dry-basis components, but dry powder is usually not a significant factor with carbide lime in transport, storage, and use. See section 16 for further descriptive information.

COMPONENT	CAS NUMBER	CONCENTRATION
Calcium hydroxide	1305-62-0	85-92.5%
Calcium carbonate	471-34-1	1.85-12%
Slag as unreacted carbon & metal silicate melt products (glass particles)	Not available.	1.0-3.1%

NOTE: Ammonium hydroxide, CAS 1336-21-6, is present in supernatant at 100-350 ppm.

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, clear airways of any slurry or caked material and give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Rinse lime from skin with copious amounts of water without rubbing; blot dry with a soft towel. Remove contaminated clothing. Use commercially available lanolin-based skin lubricating oils to treat slight burns and reduce irritation due to drying. Wash clothing with soap and a cup of vinegar before reuse. Discard shoes and gloves if contaminated with lime on the inside.

SWALLOWING: Give two glasses of water. Do not induce vomiting. Call a physician.

EYE CONTACT: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. It may be necessary to physically remove solid particles with a swab. Immediately see a physician, preferably an ophthalmologist.

NOTES TO PHYSICIAN: *Use of acidics to neutralize swallowed contents is contraindicated. Use of an EDTA (ethylenediaminetetraacetic acid) solution for rinsing the eyes may help to remove solid particles of the material and relieve some corneal opacification.*

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Calcium hydroxide cannot catch fire.

SUITABLE EXTINGUISHING MEDIA: Use media appropriate for surrounding fire.

PRODUCTS OF COMBUSTION: Not applicable.

PROTECTION OF FIREFIGHTERS: WARNING! Nonflammable solid particulates in water suspension. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

Specific Physical and Chemical Hazards. Carbide lime is a co-product of the generation of acetylene using calcium carbide and water. Some unreacted calcium carbide is normally discharged from the acetylene generator with the lime. With subsequent agitation from handling and retention of carbide lime in open vessels, the calcium carbide completes its reaction, and acetylene evolves from solution. Although a combustible acetylene-air mixture could possibly form in the acetylene-lime plant, only trace amounts of acetylene will remain soluble in supernatant of lime slurry. Since the lower explosion limit for acetylene in air is 2.4 percent, combustion is highly unlikely; nonetheless, use of vented or open-top tanks is recommended.

Protective Equipment and Precautions for Firefighters. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

WARNING! Nonflammable solid particulates in water suspension.

Personal Precautions. Contain spill. Keep personnel away. Calcium hydroxide will raise the pH of water. Prevent water run-off from entering sewers and water supplies. Affected areas may be slippery.

Environmental Precautions. WASTE DISPOSAL METHOD: Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

SMALL SPILLS: Carefully scoop or shovel lime into a clean dry container for disposal or recovery. If any lime has dried out, avoid making dust. Recovered lime may be collected for reuse. Small amounts may be diluted with water and flushed to a sewer, but only upon approval by the regulatory agencies having jurisdiction.

LARGE SPILLS: Isolate hazard area and keep unnecessary people away. Stay upwind from dried material and uphill from slurry spills. Carefully scoop or shovel lime into a clean dry container for disposal or recovery. If any lime has dried out, avoid making dust. Recovered lime may be collected for reuse. Small amounts may be diluted with water and flushed to a sewer, but only upon approval by the regulatory agencies having jurisdiction.

OTHER CONSIDERATIONS: Carbide lime will coat concrete, metal, and other porous surfaces. It reacts with carbon dioxide in the air to form calcium carbonate (limestone). If allowed to dry, it will become cement-like as when used for whitewash, which adheres to surfaces and can be hard to remove. Wet carbide lime can be removed from surfaces by rinsing with water or wiping with an absorbent cloth.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING: Do not eat, drink, or smoke in areas of storage or use. Wash hands and face thoroughly before eating, drinking, smoking, applying cosmetics, or using the toilet. Slurry or moist carbide lime is mildly caustic. Have safety showers and eyewash fountains available where carbide lime is handled, stored, or used. Slurry or moist lime may contain small amounts of flammable acetylene. Keep away from heat, sparks, and

open flame. Prohibit consumption of food or beverages in work areas. Limit access to storage and handling areas to trained, authorized personnel. Check the atmosphere in carbide lime areas for explosive conditions before starting maintenance activities.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store in a clean, ventilated area. Isolate incompatible materials. Vessels used to store carbide lime should be open-top or vented to the atmosphere to eliminate the potential for acetylene gas to accumulate in a closed space. Although the potential for carbide lime to liberate significant quantities of acetylene dissipates within 48 hours after generation, it is recommended that storage of carbide lime slurry be posted with "NO SMOKING" or "NO OPEN FLAMES" signs. Acetylene released from slurry or from unreacted calcium carbide can ignite from any source of ignition. All electrical equipment used in or around carbide lime storage or handling areas should comply with National Electrical Code requirements.

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2009)
Calcium hydroxide	5 mg/m ³ (respirable)	5 mg/m ³
Calcium carbonate	5 mg/m ³ (respirable)*	N.E.**
Slag as unreacted carbon & metal silicate melt products (glass particles)	N.E.**	N.E.**

* (c) – ceiling. Ceiling values are not Time-Weighted-Average (TWA).

**N.E.–Not Established.

TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

IDLH = Not available.

ENGINEERING CONTROLS:

Local Exhaust. Use local exhaust ventilation with sufficient airflow to prevent accumulation of acetylene.

Mechanical (General). None

Special. None

Other. None

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Wear long-sleeve, cotton-like (absorbent) shirts, PVC or rubber-coated gloves, and a cap or hard hat. A waterproof, plastic protective garment and a hard hat with a full face shield are recommended when handling lime slurry under pressure. Hard hat, safety shoes, rubber boots, rubber apron, and protective clothing. Trousers and sleeves should extend over footwear and gloves. Select in accordance with OSHA 29CFR 1910.132 and 1910.133. Regardless of protective equipment, never touch live electrical parts.

Eye/Face Protection. Select in accordance with OSHA 29CFR 1910.133.

Respiratory Protection. A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must

be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

9. Physical and Chemical Properties

APPEARANCE:	Slurry: Thick, gray liquid suspension in water, with moisture content greater than 58%. Cake: Gray mud or granules similar to wet sand, with moisture content between 44-58%. Dry Solid: 44-38% moisture content—gray to white granular crust-like crystalline material (calcium carbonate) formed by reaction of calcium hydroxide with carbon dioxide in air and release of molecular water of hydration. Moisture content of less than 38% requires a mechanical drying mechanism.
ODOR:	Slurry will have a slight to strong ammonia; fresh production carbide lime may have a slight odor of garlic due to minute amounts of dissolved acetylene. This odor dissipates quickly when the lime is exposed to air. Cake will have a slightly musty odor or be odorless.
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Can be either a slurry, sake, or dry solid at normal temperature and pressure
pH at 77°F (25°C):	12.454
MELTING POINT at 1 atm:	Slightly below that of water.
BOILING POINT at 1 atm:	Disassociates at 1076°F (580°C) to form water and calcium oxide.
FLASH POINT (test method):	Not applicable.
EVAPORATION RATE (Butyl Acetate = 1):	Not available.
FLAMMABILITY:	Nonflammable.
FLAMMABLE LIMITS IN AIR, % by volume:	LOWER: Not applicable. UPPER: Not applicable.
VAPOR PRESSURE at 68°F (20°C):	Not applicable.
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	Not applicable.
SPECIFIC GRAVITY (H₂O = 1) at 19.4°F (-7°C):	10% solids: 1.058, 30% solids: 1.199, 50% solids: 1.379
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	Not available.
SOLUBILITY IN WATER 68°F (20°C):	0.185 g/100 cc water—1850 ppm
PARTITION COEFFICIENT: n-octanol/water:	Not available.
AUTOIGNITION TEMPERATURE:	Not applicable.
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	100
MOLECULAR WEIGHT:	74.01
MOLECULAR FORMULA:	Ca(OH) ₂ + H ₂ O

10. Stability and Reactivity

CHEMICAL STABILITY: Unstable Stable

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIALS: Acids, copper, silver, and mercury and their salts, compounds, and alloys; organic nitrogen compounds; maleic anhydride; phosphorus; halogens

HAZARDOUS DECOMPOSITION PRODUCTS: Calcium oxide

POSSIBILITY OF HAZARDOUS REACTIONS: May Occur Will Not Occur

11. Toxicological Information

ACUTE DOSE EFFECTS: LD₅₀ = 7340 mg/kg, oral, rat.

STUDY RESULTS: Carbide lime is nontoxic; however, it may cause skin and eye irritation and burns. The irritant effects of lime are primarily due to its alkalinity, but dehydrating and thermal effects may be contributing factors.

12. Ecological Information

ECOTOXICITY: Acute and Long-Term Toxicity to Fish and Invertebrates: TLm Mosquito Fish: 240 ppm/24 hrs; 220 ppm/48 hrs; 160 ppm/96 hrs at 70-73.5°F (21-23°C). Carbide lime does not contain any Class I or Class II ozone-depleting chemicals. Carbide lime is not listed as a marine pollutant by DOT.

OTHER ADVERSE EFFECTS: This product does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Recovered lime can be collected and reused for many applications such as water treatment, road stabilization, and acid neutralization. When disposal becomes necessary, dispose in accordance with federal, state, and local regulations. Consult environmental regulatory agencies for guidance on acceptable disposal practices.

14. Transport Information

DOT/IMO SHIPPING NAME: Calcium hydroxide

HAZARD CLASS:	PACKING GROUP/Z one:	IDENTIFICATION NUMBER:	PRODUCT RQ:
Not regulated.	NA*/NA *	NA	NA

SHIPPING LABEL(s): NA

PLACARD (when required): NA

*NA=Not applicable.

MARINE POLLUTANTS: Carbide lime is not listed as a marine pollutant by DOT. Although carbide lime is not considered a hazardous material, you should take adequate precautions to prevent unauthorized discharge and spills or leakage into rivers, lakes, streams, sewers, or onto lands where it may adversely affect the environment or wildlife.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None

EHS RQ (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

PRESSURE: No

DELAYED: Yes

REACTIVITY: No

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

None of the components of this mixture are subject to reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

None of the components of this mixture are listed as regulated substances.

TSCA: TOXIC SUBSTANCES CONTROL ACT: This product is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

None of the components of this mixture are listed in Appendix A as highly hazardous chemicals.

STATE REGULATIONS:

CALIFORNIA: None of the components of this mixture are listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: All of the components of this mixture are subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

PRODUCT DESCRIPTION: Carbide lime, a co-product of acetylene generation, is a fully hydrated form of calcium hydroxide. Carbide lime is normally mixed with water, and dry powder is usually not a significant factor. However, if carbide lime is exposed to the air, a small amount of dust may form. This dust is due to the scavenging of carbon dioxide from the air, forming calcium carbonate crystals, similar to stalactites and stalagmites (limestone). Slight variations in analysis and the presence of foreign matter in carbide lime will exist depending on local conditions at the point of production.

MAXIMUM ACETYLENE DISSOLVED IN WATER: The maximum volume of acetylene that may be dissolved in water (saturated) at 100°F (38°C) is 0.5 cu ft (14.2 l) of acetylene per cubic foot (28.3 l) of water, which equals 0.034 lb (0.015 kg) of acetylene or 554 ppm by weight in the water fraction of the suspension.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Nonflammable solid particulates in water suspension.* Store and use with adequate ventilation at all times. For detailed information on the hazards associated with acetylene, see Praxair Material Safety Data Sheet P-4559 and safety precautions booklet P-3499.

Mixtures. When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, chemicals have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:

HEALTH	= 1
FLAMMABILITY	= 0
INSTABILITY	= 0
SPECIAL	= None

HMIS RATINGS:

HEALTH	= 1
FLAMMABILITY	= 0
PHYSICAL HAZARD	= 0

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information can be found in the following materials published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, <http://www.cganet.com/Publication.asp>.

- G-1 *Acetylene*
- G-1.5 *Carbide Lime—Its Value and Uses*
- G-1.8 *Guidelines for the Operation and Closure of Lime Ponds*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

Praxair and the *Flowing Airstream* design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.



Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113