

SHIPPING QUICKLIME BY AIR

Any shipments of calcium oxide offered for transportation **by air**, even if only in small quantities, such as samples directed to customers and laboratories, are strictly regulated by the U.S. Department of Transportation (DOT) Hazardous Materials Regulations [HMR] [49 Code of Federal Regulations (CFR) Parts 107-185]. The regulations have separate and distinct requirements for packaging, marking, labeling, documentation, and training.

Calcium oxide transported by ground - rail or highway motor freight - is not subject to the HMR (although other regulations may apply). Express shippers (such as Federal Express, Airborne Express, and United Parcel Service), at these carriers' scheduling discretion, may ship packages labeled "Ship Ground Surface Only" by air! In other words, express shippers may also be air carriers. To assure compliance, companies should 1) use motor freight carriers that can guarantee ground transport only, or 2) use the air shipment procedures for all packages sent by express shippers.

A short introduction to the portions of hazardous material regulations that directly apply to the lime industry follows. It is not intended to be complete. Title 49 CFR Parts 171 to 178 should be studied in detail by shipping personnel.

PACKAGING (49 CFR §§ 178.600-178.609)

Generally, lime companies ship samples of material containing calcium oxide in five-gallon plastic pails, one-gallon metal cans, or small plastic bottles encased in carefully prepared fiberboard boxes. Outer packagings used for these small calcium oxide shipments must meet the non-bulk packagings requirements for solid hazardous materials in Packing Group III, as set out in 49 CFR § 173.213. Five gallon specification plastic pails have the marking "(UN) 1H2" on the bottom of the pail. Specification fiberboard boxes have the marking "(UN) 4G." For inner packaging, use 0.02 inch thick minimum plastic bags or containers. The inner packages must be sealed or tied and the contents of each should be identified. Use of glass or aluminum containers should be avoided.

If the shipment contains a limited quantity, which is defined as a package that does not exceed 30 kg (66 pounds) gross weight, it is not necessary to use specification packagings. Combination packagings may be used with inner packagings of not over 5.0 kg (11 pounds) net capacity each for solids, packed in strong outer packagings (pursuant to 49 CFR § 173.213(b)).

MARKING AND LABELING (49 CFR § 172.300-172.450)

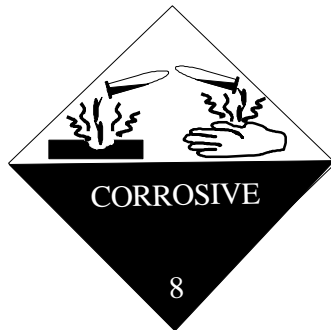
Packages must be clearly marked and labeled with the appropriate information.

For material containing calcium oxide, the shipping name (Calcium Oxide), UN number (UN 1910), and the diamond shaped hazard class (CORROSIVE) label must appear on the outside of the package. The shipping name and UN number can be typed and printed on a label:

<p>CALCIUM OXIDE UN 1910</p>
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If the package contains a limited quantity of calcium oxide (i.e., 66 pounds or less), that must be indicated by marking "Limited Quantity" or "Ltd Qty" following the basic description.

A diamond shaped, black and white, CORROSIVE label of the type shown below must also be applied to the outside of the package. These adhesive-backed labels are available from various vendors.



For passenger aircraft shipments, a single package may weigh no more than 25 kilograms (approximately 55 pounds). For cargo aircraft, the single package limit is 100 kilograms (approximately 220 pounds). If a shipment exceeds the quantity limitation for passenger aircraft, 49 CFR § 172.448 specifies that an orange and black CARGO AIRCRAFT ONLY label such as the one shown below must be applied to the outside of the package.



SHIPPING PAPERS/DOCUMENTATION (49 CFR §§ 172.200 – 172.204)

The document, manifest, or waybill for domestic air transport (or international air cargo, if applicable), as well as the applicable Declaration of Dangerous Goods, must be completed by a trained and certified person according to procedures outlined in 49 CFR § 172.200-172.204. The shipment must be accompanied by shipping papers that include the proper shipping name (Calcium oxide), the hazard class (8), the identification number (UN 1910), the packing group (III), and the total quantity of material, including the unit of measurement (e.g., 4.5 gm.; 8 lbs.). This information

must be shown in sequence: Calcium oxide, 8, UN 1910, PG III, and the total quantity. If the shipment is a limited quantity (i.e., 66 pounds or less), that must also be indicated. If the quantity of calcium oxide in one package exceeds 25 kg, it must be transported on cargo aircraft only, and the words "Cargo Aircraft Only" added at the end of the description.

The documentation must also include a shipper's certification that the contents are classified, packed, marked and labeled, and in proper condition for carriage by air, as set out in 49 CFR § 172.204(c). Any documentation for air transportation must be prepared in duplicate, as the carrier will retain one copy of the documentation in its files.

A Material Safety Data Sheet may be included for each chemical contained in the package.

TRAINING (49 CFR §§ 172.700-172.704)

Hazardous material training is required for each person involved in packaging, marking, labeling, preparing shipping documents, or handling any function, including loading or unloading, associated with the shipment of a hazardous material by air transportation. In addition, all employees who receive this training must be certified, by the employer or outside training contractor, as having been trained and tested as required by the HMR.

The regulations require three areas of training:

1. General familiarization with applicable regulations. One way to meet this requirement is to use "Hazardous Materials Transportation Training Modules" that DOT has prepared for this purpose (available on-line at <http://hazmat.dot.gov/mod.htm> or as a CD-ROM for \$25).
2. Function-specific aspects of shipping hazardous material, and
3. Safety in handling hazardous material.

The last two areas can be addressed by an in-house training session. There are also organizations available that can provide more formal training (see, for example, the list of organizations on DOT's Research and Special Programs Administration (RSPA) Office of Hazardous Materials Safety website at <http://www.hazmat.dot.gov/training>, or do a search on the Internet for "hazardous materials training courses." Dangerous Goods Information Online at <http://www.iata.org/cargo/dg/index.htm> will provide a list of training schools endorsed by the International Air Transport Association (IATA), as well as a dangerous goods primer and links to other dangerous goods related sites that relate to the international shipment of dangerous goods.

The major freight and package carriers often provide excellent guidance and advice, as well as limited hazardous materials shipping information and materials in conjunction with their shipping seminars. The following toll-free customer service numbers and Internet addresses may also be helpful:

- Federal Express Corporation 1-800-463-3339
Access the FedEx On Line Service Guide at <http://www.fedex.com/us/services/dangerousgoods> for information on FedEx's dangerous goods services as well as information on FedEx's dangerous goods seminars on the preparation of hazardous materials for shipment. FedEx provides seminar information, seminar schedules, and seminar registration forms online.
- United Parcel Service 1-800-742-5877
UPS has many restrictions on shipping of hazardous materials and requires a written contract prior to any hazardous materials acceptance.
- DHL 1-800-225-5345
- Airborne Express 1-800-247-2676

Links to the hazardous materials regulations (49 CFR Parts 100-185), DOT clarification (interpretation) letters of the hazardous materials regulations, and other transportation-related sites can be accessed at <http://www.text-trieve.com/dotrspa>. The Aerosafety website <http://www.avlaw.com> provides a hazardous materials channel that contains a searchable MSDS database with links to additional MSDS databases as well as other hazardous materials information. The FAA provides hazardous materials transportation information at its Civil Aviation Security Dangerous Goods Program site at <http://cas.faa.gov/cas/dgp.htm>, including informational bulletins relative to specific materials.

SUMMARY

It is the shipper's responsibility in preparing hazardous material for air transportation to:

- Classify the material (for purposes of air transport, federal regulations characterize calcium oxide as a "hazardous material");
- Determine if the material is regulated and if weight limits apply (calcium oxide is regulated in air transportation and weight limits apply);
- Determine applicable requirements and package, mark, and label the material accordingly;
- Properly describe the material in shipping documents; and
- Provide training for and certify all employees involved in calcium oxide shipments.