Section 9
Hazard Communication

Action Items

1. Prepare your written HazCom Program -- Use the generic Program and checklist in this Section.
2. Prepare your chemical list.
3. Collect and collate Material Safety Data Sheets (MSDS) for chemicals on your list and put them in notebooks. Obtain container labels.
4. Determine the chemicals each worker is exposed to.
5. Train workers on chemical hazards they are exposed to (Read your written program to them and also read the MSDS sections on the chemicals’ hazards and controls/protective measures).
6. Provide other operators and contractors information on the properties of your hazardous chemicals.
7. Select an MSDS for the product(s) you produce. See sample MSDS for product containing silica and one for limestone in this Section.
8. Label your product (See Crystalline Silica Label in this Section) and all hazardous chemicals on your mine site – see labeling instructions in checklist for Written HazCom Program).
9. Make a hazardous chemical information sheet for any contractors you hire to work on the mine site.
10. Make and place signs throughout the mine property restricting visitors from entering areas where they would be exposed to hazardous chemicals.
11. Modify your training plans to incorporate HazCom. You may simply attach a copy of the appropriate modification included near the end of this section.
Contents of This Section

- Test 3
- Generic HazCom Program 5-7
- Program Checklist 8-9
- Warning Label for Crystalline Silica Product 10
- MSDS for Sand & Gravel Product 11-16
- MSDS for Limestone Product 17-22
- Typical Small-Mine Chemical List 23-24
- Section C – Training Plan Modification for HazCom 25-31
  - Part 46 Surface Plans 26-28
  - Part 48 Surface Plans 29-31
- HazCom Fill-In-The-Blank Test 32
Test Your Knowledge of MSHA’s HazCom Rule (answers on bottom of page)

1. The HazCom standard restricts chemical use, requires controls and sets exposure limits?  T, F.
2. The HazCom standard is an information and training standard to reduce chemically related injuries and illnesses?  T, F.
3. You must keep MSDSs for each hazardous chemical at your mine?  T, F.
4. You need not establish a written HazCom program?  T, F.
5. Your miners need to be trained about your HazCom program and about the hazards and protective measures for any new hazardous chemicals they will be exposed to?  T, F.
6. Training is required annually?  T, F.
7. The HazCom standard requires that you have MSDSs for chemicals that are either a physical or health hazard?  T, F.
8. The HazCom standard doesn’t require that your MSDSs be kept in a location where workers can access them readily?  T, F.
9. No consumer products need to be included in your Hazardous Chemical List?  T, F.
10. No articles need to be included in your Hazardous Chemical List?  T, F.
11. Personal items (food, tobacco, drugs, cosmetics etc.) packaged for retail sale and intended for personal use need not be included in your hazardous chemical list?  T, F.
12. Biological and radiation hazards need not be included in your hazardous chemical list?  T, F.
13. Wood or wood products, typically, need not be included in your hazardous chemical list?  T, F.
14. MSHA has sample written HazCom programs on the Internet at www.msha.gov?  T, F.
15. Missing or defaced labels on hazardous chemicals must be replaced immediately?  T, F.
16. A mine operator is not responsible for an inaccurate label supplied by a manufacturer?  T, F.
17. Most mine products contain respirable crystalline quartz and this requires that the mine prepare an MSDS and warning label?  T, F.
18. The date the standard was enforced is September 23, 2002 for mines with 6 or more miners and March 21, 2003 for mines with 5 or fewer miners?  T, F.
19. An unlabeled temporary, portable container must be empty at the end of the shift?  T, F.
20. The mine operator must make all written HazCom materials available to miners and designated representatives?  T, F.
21. The mine must pay for only the first copy of HazCom materials provided to miners?  T, F.
22. Training must include providing information on location of HazCom materials at the mine, location of hazardous chemicals at the mine, how to tell if a chemical is present, protective measures, and how the operator protects the miner?  T, F.
23. HazCom is currently covered under Part 47 of 30 CFR?  T, F.

Subsection A. GENERIC HAZCOM PROGRAM

Note -- If you want to understand more about the HazCom standard, go to the interactive program at http://www.msha.gov/Hazcom/Buttons/index.htm.

Contents of This Subsection:

1. A generic fill-in-the-blank HazCom Program is presented on pages 5-7. This program was found on MSHA’s web site. Fill in the blanks and you will have a written HazCom Program.

2. A checklist on pages 8 and 9 for you to use to help make sure that you are doing the things the HazCom standard requires.

3. A warning label for a product containing “Crystalline Silica” on page 10. If you have a mine product, you will need such a label.

4. An MSDS for a Sand and Gravel Product on pages 11-16. If you are mining sand and gravel, you may be able to use this one by simply filling in the company information requested.

5. An MSDS for a Limestone Product on pages 17-22. If you are mining limestone, you may be able to use this one by simply filling in the company information requested.

Note that you should be able to do the initial training yourself. This might consist of: 1) reading your written program to all employees and 2) for each hazardous chemical they may possibly be exposed to, reading the information on the label and (or) MSDS about it’s hazards and about how employees can protect themselves from these hazards. Keep a written record of this training (such as a Part 46 Task Training Certificate) on site including, for each subject: 1) the time spent (i.e. 15 minutes), 2) the training method (i.e. lecture, discussion), 3) coarse materials (i.e. written program, MSDSs, labels), and 4) the evaluation method (i.e. oral feedback).
HAZARD COMMUNICATION PROGRAM

Mine Name: __________________
ID No.: __________________

47.32(a)(1) HAZARD DETERMINATION

Each chemical brought on mine property and each chemical produced on mine property will be evaluated to determine if it is hazardous.

47.32 (a)(2) LABELS AND OTHER FORMS OF WARNING

The labeling system at this time is:

☐ Manufacturers’ Labels
☐ Other [Describe any in-house system, such as use of special numbers or graphics].

47.32 (a)(3) MATERIAL SAFETY DATA SHEETS (MSDS)

This program includes a current, legible, and accessible Material Safety Data Sheet (MSDS) for each hazardous chemical at this mine site.

☐ Manufacturers’ MSDS
☐ Other

MSDS’s will be accessible to miners during each work shift for each hazardous chemical to which they may be exposed either:

☐ At each work area where the hazardous chemical is produced or used
☐ At an alternative location (__________________________________________), provided that the MSDS is readily available to miners in an emergency.

47.32(a)(4) MINER TRAINING

All miners will receive instruction about the physical and health hazards of chemicals in their work areas, the protective measures they can take against these hazards (personal protective equipment, ventilation, warning signs, etc.), and the contents of the mine’s HazCom Program (47.2).

NOTE: 30 CFR, Parts 46 & 48, have been amended to include HazCom Training Requirements

47.32(c)(1)(2) TRAINING FOR OTHER OPERATORS

Other operators at this mine will be provided with access to MSDS’s and informed about hazardous chemicals to which their miners can be exposed, the labeling system on the
containers of these chemicals, and appropriate protective measures.

**47.32(b)(1,2) LIST OF HAZARDOUS CHEMICALS**

This is a current list of all hazardous chemicals known to be at this mine, including hazardous chemical waste.

Each hazardous chemical on this property will be clearly identified in exactly the same way on the list, its container label, and its corresponding MSDS.

<table>
<thead>
<tr>
<th>No.</th>
<th>Chemical/Common/Trade Name</th>
<th>Mine or Work Area</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>No.</td>
<td>Chemical/Common/Trade Name</td>
<td>Mine or Work Area</td>
</tr>
<tr>
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</tbody>
</table>
HAZCOM PROGRAM CHECKLIST

**Note** – It is recommended that you attach this checklist to your Written HazCom Program!

1. [ ] Is chemical list current? Is a copy available with this Program and with each MSDS file?
2. [ ] Are copies of the MSDS available for every hazardous chemical brought onto the mine site?
3. [ ] Are MSDSs immediately available to workers (for chemicals they may be exposed to)?
4. [ ] Are all potentially exposed miners on all workshifts aware of where and how to immediately access MSDSs?
5. [ ] Are the same chemical names used on labels, on MSDSs and on your chemical list?
6. [ ] Do all hazardous chemical containers have a clearly readable label?
7. [ ] Are all temporary portable containers labeled if they are not emptied by the end of the shift?
8. [ ] Are all bulk storage containers of hazardous chemicals labeled (for example -- diesel fuel or gasoline)?
9. [ ] Are all stationary process containers identified by a label or alternative means which: a) clearly identifies the container to which it applies, b) contains the required hazard warning information, and c) is immediately available to miners in the work area.
10. [ ] Does each container of hazardous chemical produced at the mine have an up-to-date container label? (Crystalline Silica Warning Label on back of weight ticket is OK)
11. [ ] Is a single system (such as HMIS System sold by Label Master) available for making labels you are required to make? Are all affected persons trained on the system?
12. [ ] Are all employees trained on the following: a) the physical and health hazards of chemicals in each miner's work area; b) Protective measures a miner can take against these hazards; and c) the contents of the company’s HazCom program and where miners can gain access to it.
13. [ ] Is HazCom training for specific chemical hazards associated with new or non-routine tasks given before beginning the task?
14. [ ] Are all contractors and (or) other operators informed verbally and (or) in writing about 1) hazardous chemicals to which their employees may be exposed while on the mine site, 2) [ ]
the labeling system used for the chemicals of concern, and 3) appropriate protective measures?

15. □ Is HazCom training recorded properly on your new miner, new experienced miner, task and annual refresher training certificates (for Part 48 training check “other” box and write-in “Initial HazCom Training”, for Part 46 add subject “Initial HazCom Training”).

16. □ Does your training plan contain the HazCom Addendum?

17. □ Do potentially exposed miners and their representatives have information on mine hazardous wastes that (1) identifies the hazardous chemical components, (2) describes physical or health hazards, and (c) specifies appropriate protective measures?

18. □ Are alternative labeling methods being used for hazardous chemicals not in containers (signs, etc. for piles, holding ponds etc.)?

19. □ Have arrangements been made for providing, upon request, one free copy of labeling information, MSDSs, the mines HazCom program, list of hazardous chemicals and any other HazCom program documents to miners, miner’s representatives or contractor? Has a fair (per page) charge been set to be paid by all who request additional copies?

20. □ Have arrangements been made to provide customers, who request them, with one free copy of the MSDS and the chemical’s label (as well as any updates) for any hazardous chemical supplied by the mine? Has a fair, per-page charge been set for all who request additional copies? Note -- see attached warning label and MSDSs for sand and gravel and limestone products containing crystalline silica.

21. □ Are visitors informed of hazardous chemicals and how to protect themselves or are signs posted which restrict visitors from areas containing hazardous chemicals?

Note -- For more details on various exemptions and procedures, see the HazCom Standard (30CFR Part 47) or obtain a copy of the June 21, 2002 Federal Register (standard is near the end).
Crystalline Silica Warning Label

Note – Almost all mined products contain crystalline silica. For this reason, you will need some sort of warning label on your product. The generic form below is one possible alternative. You will need to fill in the information requested.

For bulk sales, this or other label may be printed on the back side of the batch ticket or given to the customer as a separate sheet attached to the batch ticket.

<table>
<thead>
<tr>
<th>Product Name:</th>
<th>CRYSTALLINE SILICA WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTENTS:</td>
<td>This product contains crystalline silica. As sold, this product does NOT contain respirable crystalline silica. Some handling methods, however, may abrade the material and produce respirable dust.</td>
</tr>
<tr>
<td>CONTROLS:</td>
<td>Use exhaust ventilation and a high efficiency particulate (HEPA) filter dust respirator when handing this material in a way that abrades the product and produces respirable dust. Take precautions to prevent the production of respirable dust.</td>
</tr>
<tr>
<td>EFFECTS:</td>
<td>Breathing excessive amounts of respirable crystalline silica over a period of time can cause a disabling lung disease. The International Agency for Research on Cancer (IARC) has determined that respirable crystalline silica is a human carcinogen.</td>
</tr>
<tr>
<td>CONTACT(S) FOR ANSWERS TO SAFETY/HEALTH QUESTIONS:</td>
<td>Company Name __________________________</td>
</tr>
<tr>
<td></td>
<td>Company Address __________________________</td>
</tr>
<tr>
<td></td>
<td>Company Phone No. __________________________</td>
</tr>
<tr>
<td></td>
<td>Contact Person __________ Phone No. __________</td>
</tr>
</tbody>
</table>
MSDS FOR SAND & GRAVEL PRODUCT
Material Safety Data Sheet
(Natural Sand or Gravel)

1. IDENTIFICATION
   Chemical Name: Natural Sand or Gravel
   Trade Name: Sand or Gravel
   Synonyms: Construction Aggregate
   Chemical Formula: N/A
   Molecular Weight: N/A
   DOT Identification No: None

2. PRODUCT AND COMPONENT DATA
<table>
<thead>
<tr>
<th>Component(s) Chemical Name</th>
<th>CAS Registry No.</th>
<th>% (Approx)</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Sand* or Gravel*</td>
<td>None</td>
<td>100</td>
<td>See section 6</td>
</tr>
<tr>
<td></td>
<td>14808-60-7</td>
<td>&gt;1</td>
<td></td>
</tr>
</tbody>
</table>
   *Composition varies naturally – typically contains quartz (crystalline silica).

3. PHYSICAL DATA
   Appearance and odor: Angular or round multicolored particles. No odor.
   Specific Gravity: 2.55 – 2.80
   Boiling point (At 1 Atm.): N/A
   Vapor Density in Air (Air = 1): N/A
   Vapor Pressure (mmHg @ 20°C): 0
   % Volatile, By Volume: 0%
   Evaporation Rate (at 1Atm, and 25°C; n-butyl acetate = 1): 0
   Solubility in Water: Negligible

4. REACTIVITY DATA
   Stability: Stable
   Conditions to Avoid: Avoid contact with incompatible materials (see below).
   Incompatibility (materials to avoid): Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosion. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.
   Hazardous Decomposition Products: Silica-containing respirable dust particles may be generated by handling.
   Hazardous Polymerization: Not known to polymerize

5. FIRE AND EXPLOSION HAZARD DATA
   Flashpoint (Method used): Not flammable
   Flammable Limits in Air: Not Flammable
   ExtinguishingAgents: None required
   Unusual Fire and Explosion Hazards: Contact with powerful oxidizing agents may cause fire and/or explosions (see section 4 of this MSDS).
6. TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.) Unless specified otherwise, limits are expressed as eight-hour time-weighted averages (TWA).

ABBREVIATIONS: TLV = threshold limit value of the American Conference of Governmental Industrial Hygienists (ACGIH); MSHA PEL = permissible exposure limit of the Mine Safety and Health Administration (MSHA); OSHA PEL = permissible exposure limit of the Occupational Safety and Health Administration (OSHA); mg/m³ = milligrams of substance per cubic meter of air.

Respirable Crystalline Silica:

2001 TWA TLV = 0.05 mg/m³ for quartz, tridymite or cristobalite, 0.1 mg/m³ for tripoli

MSHA and OSHA TWA PEL* (based on 1973 TWA TLV) for respirable particulate containing crystalline silica = 10 mg/m³ / (%SiO₂ + 2); This limits the TWA of the crystalline silica content to approximately 0.1 mg/m³.

* Divide calculated MSHA and OSHA PEL limits for quartz by 2 to obtain limits for crystalline silica in the form of tridymite or cristobalite.

Other Particulates:

Respirable particulate not otherwise classified (no asbestos & < 1% crystalline silica):

2001 TWA TLV = 3 mg/m³,

OSHA (& MSHA) PEL = 5 mg/m³ – this is also equal to the value obtained using the 1973 TLVs formula above for respirable dust containing crystalline quartz -- 10/(%SiO₂+2), which, when the % SiO₂ is equal to 0.00, 10/(0.00 + 2), equals 5 mg/m³.

Total particulate not otherwise classified (no asbestos & < 1% crystalline silica) --

2001 TWA TLV = 10 mg/m³

MSHA PEL = 30 mg/m³ / (% quartz + 3);
OSHA PEL = 30 mg/m³ / (% quartz + 2)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate TLVs/PELs. However, because of the wide variation in individual susceptibility, lower exposure limits may be
MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

Medical Conditions Aggravated By Exposure
Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions.

Primary Route(s) of Exposure: XInhalation ___Skin ___Ingestion

Acute Toxicity
EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.

SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion.

SKIN ABSORPTION: Not expected to be a significant exposure route.

INGESTION: Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of appropriate exposure limits.

Use of natural sand and gravel for construction purposes is not believed to cause additional acute toxic effects. However, repeated overexposures to very high levels of respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as six months have caused acute silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain.

First Aid
EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or later develops.

SKIN: Wash with soap and water. Contact a physician if irritation persists or later develops.

INGESTION: If person is conscious, give large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get immediate medical attention.

INHALATION: Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops.
MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

For emergencies, contact __________________________________

**Chronic Toxicity**

Prolonged and repeated inhalation of respirable crystalline silica-containing dust in excess of appropriate exposure limits has caused silicosis, a lung disease. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased. Symptoms of silicosis may include, but are not limited to, the following: shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Smoking may increase the risk of developing lung disorders, including emphysema and lung cancer. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Sand or gravel is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA). In October 1996, an IARC Working Group re-assessing crystalline silica, a component of this product, designated respirable crystalline silica as carcinogenic (Group 1). The NTP’S Report on Carcinogens, 9th edition, lists respirable crystalline silica as a “known human carcinogen.” In year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica.

**7. PERSONAL PROTECTION AND CONTROLS**

**Respiratory Protection** For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.1 mg/m$^3$, a NIOSH approved dust respirator must be worn. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.5 mg/m$^3$, a NIOSH approved HEPA filter respirator must be
MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

worn. If respirable quartz levels exceed or are likely to exceed an 8-hr TWA of 5 mg/m³, a NIOSH approved positive pressure, full-face respirator or equivalent is required. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

**Ventilation**
Local exhaust or general ventilation adequate to maintain exposures below appropriate exposure limits.

**Skin Protection**
See “Hygiene” section below.

**Eye Protection**
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated.

**Hygiene**
Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

**Other Control Measures**
Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations that are well-ventilated with clean air.

8. STORAGE AND HANDLING PRECAUTIONS

This product is not intended or designed for use as an abrasive blasting medium or for foundry applications, and should not be used for these purposes.

Follow the personal protection and controls set forth in Section 7 of this MSDS when handling this product. Respirable crystalline silica-containing dust may be generated during processing, handling, and storage.

9. SPILL, LEAK AND DISPOSAL PRACTICES

**Steps to be Taken in Case Material is Released or Spilled**
The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Spilled material, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry-sweep spilled material.

Prevent spilled materials from inadvertently entering streams, drains, or sewers.

For emergencies, contact _____________________________
MSDS FOR SAND & GRAVEL PRODUCT CONTINUED

Waste Disposal Method
Pick up and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

10. TRANSPORTATION

DOT Hazard Classification: None      Placard Required: None      Label Required: Label as required by the OSHA Hazard Communication Standard [29 CFR 1910.1200 (f) and applicable state and local laws and regulations. See label in Appendix C

For Further Information Contact: Name _______________________, Phone No. ____________________
Address ____________________________

Date of Preparation:
______________________________________________________________

Emergency Information: Name _______________________, Phone No. ____________________ , Email ____________________________

Notice: ______________________ believes the information contained herein is accurate; however, ______________________ makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein is not intended to be and should not be construed as legal advice or as ensuring compliance with any federal, state or local laws and regulations. Any party using this product should review all such laws, rules or regulations prior to use.

NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.
MSDS FOR LIMESTONE PRODUCT
Material Safety Data Sheet
(Limestone)

1. IDENTIFICATION
Chemical Name: Limestone  Chemical Formula: N/A
Molecular Weight: N/A  Trade Name: Crushed Stone
DOT Identification No: None

Synonyms: Aggregate, Aglime, Barn Lime, Coverstone, Flexible Base, Fluxing Agent, Manufactured Sand, Mineral Filler, Screenings

2. PRODUCT AND COMPONENT DATA

<table>
<thead>
<tr>
<th>Component(s) Chemical Name</th>
<th>CAS Registry No.</th>
<th>% (Approx)</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limestone*</td>
<td>1317-65-3</td>
<td>100</td>
<td>See section 6</td>
</tr>
<tr>
<td>*Composition varies naturally – typically contains quartz (crystalline silica).</td>
<td>14808-60-7</td>
<td>&gt;1</td>
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</tbody>
</table>

3. PHYSICAL DATA
Appearance and odor: Angular gray, white and tan particles ranging in size from powder to boulders. No odor.

Specific Gravity: 2.6 – 2.75
Boiling point (At 1 Atm.): N/A
Vapor Density in Air (Air = 1): N/A
Vapor Pressure (mmHg @ 20 °C): N/A
% Volatile, By Volume (@ 100 °F): 0%
Evaporation Rate (at 1 Atm. and 25EC; n-butyl acetate = 1): 0
Solubility in Water: 0

4. REACTIVITY DATA

Stability: Stable
Conditions to Avoid: Avoid contact with incompatible materials (see below).

Incompatibility (materials to avoid): Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.

Hazardous Decomposition Products: Limestone ignites on contact with fluorine and is incompatible with acids, alum, ammonium salts, and magnesium. Silica reacts violently with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride yielding possible fire and/or explosions. Silica dissolves readily in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.

Hazardous Polymerization: Not known to polymerize
5. FIRE AND EXPLOSION HAZARD DATA

Flashpoint (Method used): Not Flammable
Flammable Limits in Air: Not Flammable
Extinguishing Agents: None Required
Unusual Fire and Explosion Hazards: Contact with powerful oxidizing agents may cause fire and/or explosions (see section 4 of this MSDS).

6. TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.) Unless specified otherwise, limits are expressed as eight-hour time-weighted averages (TWA).

ABBREVIATIONS: TLV = threshold limit value of the American Conference of Governmental Industrial Hygienists (ACGIH); MSHA PEL = permissible exposure limit of the Mine Safety and Health Administration

Respirable Crystalline Silica:

\[
2001 \text{ TWA TLV} = 0.05 \text{ mg/m}^3 \text{ for quartz, tridymite or cristobalite, 0.1 mg/m}^3 \text{ for tripoli}
\]

\[
\text{MSHA and OSHA TWA PEL}^* \text{ (based on 1973 TWA TLV) for respirable particulate containing crystalline silica} = 10 \text{ mg/m}^3 / (\%\text{SiO}_2 + 2) \text{; This limits the TWA of the crystalline silica content to approximately 0.1 mg/m}^3.
\]

* Divide calculated MSHA and OSHA PEL limits for quartz by 2 to obtain limits for crystalline silica in the form of tridymite or cristobalite.

Other Particulates Including Limestone:

Respirable particulate not otherwise classified (no asbestos & < 1% crystalline silica);

\[
2001 \text{ TWA TLV} = 3 \text{ mg/m}^3,
\]

\[
\text{OSHA (MSHA) PEL} = 5 \text{ mg/m}^3 \text{ -- this is also equal to the value obtained using the 1973 TLVs formula above for respirable dust containing crystalline quartz} -- 10/(\%\text{SiO}_2 + 2), \text{ which, when the } \%\text{ SiO}_2 \text{ is equal to 0.00, } 10/(0.00 + 2), \text{ equals 5 mg/m}^3.
\]

Total particulate not otherwise classified (no asbestos & < 1% crystalline silica) --

\[
2001 \text{ TWA TLV} = 10 \text{ mg/m}^3
\]
MSDS FOR LIMESTONE PRODUCT CONTINUED

MSHA PEL = 30 mg/m³ / (% quartz + 3);
OSHA PEL = 30 mg/m³ / (% quartz + 2)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate TLVs/PELs. However, because of the wide variation in individual susceptibility, lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

Medical Conditions Aggravated by Exposure

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions.

Primary Route(s) of Exposure:  X Inhalation  ___Skin  ___Ingestion

Acute Toxicity

EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.
SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion. SKIN ABSORPTION: Not expected to be a significant exposure route. INGESTION: Expected to be practically non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage. INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of appropriate exposure limits.

First Aid

EYES: Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or later develops.
SKIN: Wash with soap and water. Contact a physician if irritation persists or later develops.
INGESTION: If person is conscious, give large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get immediate medical attention.
INHALATION: Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or later develops.

For emergencies, contact __________________________

Chronic Toxicity

Prolonged and repeated inhalation of respirable crystalline silica-containing dust in excess of appropriate exposure limits has caused silicosis, a lung disease. Not all individuals with silicosis will
exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms can appear at any time, even years after exposure has ceased. Symptoms of silicosis may include, but are not limited to, the following: shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; right heart enlargement and/or failure. Smoking may increase the risk of developing lung disorders, including emphysema and lung cancer. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size.

Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Limestone is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA). In October 1996, an IARC Working Group re-assessing crystalline silica, a component of this product, designated respirable crystalline silica as carcinogenic (Group 1). The NTP’s Report on Carcinogens, 9th edition, lists respirable crystalline silica as a “known human carcinogen.” In year 2000, the American Conference of Governmental Industrial Hygienists (ACGIH) listed respirable crystalline silica (quartz) as a suspected human carcinogen (A-2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica.

**California Proposition 65:** WARNING: This product contains chemical(s) known to the state of California to cause cancer.

7. PERSONAL PROTECTION AND CONTROLS

**Respiratory Protection**
For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.1 mg/m$^3$, a NIOSH approved dust respirator must be worn. For respirable quartz levels that exceed or are likely to exceed an 8-hr TWA of 0.5 mg/m$^3$, a NIOSH approved HEPA filter respirator must be worn. If respirable quartz levels exceed or are likely to exceed an 8-hr TWA of 5 mg/m$^3$, a NIOSH approved positive pressure, full-face respirator or equivalent is required. Respirator use must comply with
applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

**Ventilation:** Local exhaust or general ventilation adequate to maintain exposures below appropriate exposure limits.

**Skin Protection**
See “Hygiene” section below.

**Eye Protection**
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated.

**Hygiene**
Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

**Other Control Measures**
Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations.

### 8. STORAGE AND HANDLING PRECAUTIONS

Respirable crystalline silica-containing dust may be generated during processing, handling, and storage. The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Do not store near food and beverages or smoking material.

### 9. SPILL, LEAK AND DISPOSAL PRACTICES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**
The personal protection and controls identified in Section 7 of the MSDS should be used as appropriate. Spilled material, where dust can be generated, may overexpose cleanup personnel to respirable crystalline silica-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry-sweep spilled material. Prevent spilled materials from inadvertently entering streams, drains, or sewers.

For emergencies, contact ______________________________

**WASTE DISPOSAL METHOD**
Pick up and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

### 10. TRANSPORTATION

**DOT Hazard Classification:** None
MSDS FOR LIMESTONE PRODUCT CONTINUED

Placard Required: None

Label Required: Label as required by the OSHA Hazard Communication Standard [29 CFR 1910.1200 (f) and applicable state and local laws and regulations. See label in Appendix C.

For Further Information Contact: Name _____________________, Phone No. ________________
Address ____________________________________________________________________________.

Date of Preparation: _____________________

Emergency Information: Name____________________, Phone No. ____________________, email ____________________.

Notice: _____________________ believes the information contained herein is accurate; however, _____________________ makes no guarantees with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein is not intended to be and should not be construed as legal advice or as ensuring compliance with any federal, state or local laws and regulations. Any party using this product should review all such laws, rules or regulations prior to use.
NO WARRANTY IS MADE, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.
“Typical Small Mine Chemical List”

<table>
<thead>
<tr>
<th>Mine HazCom Number</th>
<th>Chemical/Common Trade Name</th>
<th>Use Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diesel fuel off-highway</td>
<td>Fueling area</td>
</tr>
<tr>
<td>2</td>
<td>Diesel fuel on-highway</td>
<td>Fueling area</td>
</tr>
<tr>
<td>3</td>
<td>Gasoline</td>
<td>Fueling area</td>
</tr>
<tr>
<td>4</td>
<td>10W30 motor oil</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>5</td>
<td>10W40 motor oil</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>6</td>
<td>Exolube 9 (Heavy Gear Lube)</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>7</td>
<td>Exolube 3 (Light Gear Lube)</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>8</td>
<td>Sulfuric Acid; SafeteeSolv (Parts Cleaner Solvent)</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>9</td>
<td>Mineral Spirits</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>10</td>
<td>Acrylic enamel paint; Permacoat</td>
<td>Maintenance shop</td>
</tr>
<tr>
<td>11</td>
<td>Propylene glycol antifreeze</td>
<td>Maintenance shop</td>
</tr>
</tbody>
</table>
Subsection C

TRAINING PLAN MODIFICATIONS TO COMPLY WITH PART 47 HAZCOM STANDARD
PART 46 PLANS

HazCom training must be covered in your Parts 46 and 48 new miner, newly-employed experienced miner, and task training (as well as in your annual refresher training if you desire). All part 46 and 48 training plans will have to be updated to incorporate the new HazCom training requirements. MSHA has prepared the required modifications for these three types of training. Simply print out the three attached addendums, attach them to your written plan, and make sure HazCom is included in all three types of training.

Part 46 Addendum to Existing Training Plan

Part 46.5 New Miner Training

Part 46.5(b)(4) Instruction on the health and safety aspects of the tasks to be assigned

<table>
<thead>
<tr>
<th>Subject: 46.5(b)(4)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about the physical and health hazards of chemicals in the work area</td>
<td>Lecture, discussion, audio/video or other</td>
<td>MSHA training modules, company safety rules, MSDSs used at the mine or other</td>
<td>Oral and/or written questions or other</td>
</tr>
<tr>
<td>Protective measures a miner can take against these hazards</td>
<td>Lecture, discussion, demonstration, audio/video or other</td>
<td>Protective equipment, copies of MSDSs used at the mine or other</td>
<td>Oral and/or written questions, demonstration or other</td>
</tr>
<tr>
<td>Contents of the mine’s HazCom program</td>
<td>Lecture, demonstration, discussion, audio/video or other</td>
<td>Company policy, information on where to find HazCom information or other</td>
<td>Oral and/or written questions, demonstration or other</td>
</tr>
</tbody>
</table>

Part 46 Addendum to Existing Training Plan
PART 46 PLANS Continued

Part 46.6 Newly hired experienced miner training

**Part 46.6(b)(4)** Instruction on the health and safety aspects of the tasks to be assigned

<table>
<thead>
<tr>
<th>Subject: 46.6(b)(4)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about the physical and health hazards of chemicals in the miner’s work area</td>
<td>Lecture, discussion, demonstration, audio/video or other</td>
<td>MSHA training modules, company safety rules, MSDSs used at the mine, or other</td>
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<td>Oral and/or written questions, demonstration or other</td>
</tr>
</tbody>
</table>

Part 46 Addendum to Existing Training Plan

**Part 46.7** New task training

**Part 46.7(a)** Miner who is reassigned to a new task in which he or she has no previous work experience.

Also, HazCom will be provided when a new hazardous chemical is introduced into a miners work area and when an existing chemical is found to possess a new hazard.
## PART 46 PLANS Continued

<table>
<thead>
<tr>
<th>Subject: 46.7(a)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about the physical and health hazards of chemicals in the miner’s work area</td>
<td>Lecture, discussion, audio/video or other</td>
<td>MSHA training modules, company safety rules, MSDSs used at the mine or other</td>
<td>Oral and/or written questions or other</td>
</tr>
<tr>
<td>Protective measures a miner can take against these hazards</td>
<td>Lecture, discussion, demonstration, audio/video or other</td>
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<td>Oral and/or written questions, demonstration or other</td>
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<td>Company policy, information on where to find HazCom information or other</td>
<td>Oral and/or written questions, demonstration or other</td>
</tr>
</tbody>
</table>
Part 48 Surface Plans

HazCom training must be covered in your Parts 46 and 48 new miner, newly-employed experienced miner, and task training (as well as in your annual refresher training if you desire). All part 46 and Part 48 training plans will have to be updated to incorporate the new HazCom training requirements. MSHA has prepared the required modifications for these three types of training. Simply print out the three attached addendums, attach them to your written plan, and make sure HazCom is included in all three types of training.

Part 48 (Surface) Addendum to Existing Training Plan

Part 48.25 **Training of new miners; minimum courses of instruction; hours of instruction**

**Part 48.25(12)** Health and safety aspects of the tasks to which the new miner will be assigned

<table>
<thead>
<tr>
<th>Subject: 46.25(12)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about the physical and health hazards of chemicals in the work area</td>
<td>Lecture, discussion, audio/video or other</td>
<td>MSHA raining modules, company safety rules, MSDSs used at the mine or other</td>
<td>Oral and/or written questions or other</td>
</tr>
<tr>
<td>Protective measures a miner can take against these hazards</td>
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<td>Oral and/or written questions, demonstration or other</td>
</tr>
<tr>
<td>Contents of the mine’s HazCom program</td>
<td>Lecture, demonstration, discussion, audio/video or other</td>
<td>Company policy, information on where to find HazCom information or other</td>
<td>Oral and/or written questions, demonstration or other</td>
</tr>
</tbody>
</table>
Part 48 Surface Plans Continued

Part 48 (Surface) Addendum to Existing Training Plan

**Part 48.26 Experienced miner training**

*Part 48.26(11)* Health and safety aspects of the tasks to which the new miner will be assigned

<table>
<thead>
<tr>
<th>Subject: 48.26(11)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about the physical and health hazards of chemicals in the miner’s work area</td>
<td>Lecture, discussion, demonstration, audio/video or other</td>
<td>MSHA training modules, company safety rules, MSDSs used at the mine, or other</td>
<td>Oral and/or written questions or other</td>
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<td>Protective measures a miner can take against these hazards</td>
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<td>Lecture, demonstration, discussion, audio/video or other</td>
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</tr>
</tbody>
</table>
Part 48 (Surface) Addendum to Existing Training Plan

Part 48.27 **Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction.**

**Part 48.27(a)(1)** Miners assigned to new work tasks as mobile equipment operators, drilling machine operators, haulage and conveyor system operators, ground control machine operators, and those in blasting operations shall not perform new works tasks in these categories until training prescribed in this paragraph and paragraph (b) of this section has been completed.

**Part 48.27(c)** Miners assigned a new task not covered in paragraph (a) of this section shall be instructed in the safety and health aspects and safe work procedures of the task.

Also, HazCom will be provided when a new hazardous chemical is introduced into a miner’s work area and when an existing chemical is found to possess a new hazard.

<table>
<thead>
<tr>
<th>Subject: 46.27(a)(1)/(c)</th>
<th>Training Methods</th>
<th>Course Materials</th>
<th>Evaluation Method(s)</th>
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<tr>
<td>Information about the physical and health hazards of chemicals in the miner’s work area</td>
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</tr>
</tbody>
</table>
1. HazCom training must include training for each hazardous chemical miners are exposed to in the following areas: _______________ and __________________. Training on the mine’s written __________________ must be included.

2. The identity used for each hazardous chemical workers are exposed to must be such that it can be cross referenced between the MSDS, the label, and the __________________.

3. When must a miner receive HazCom training? ____________________________________________

4. You can find out about your company’s HazCom program by reading it’s _______________ ________________.

5. All except temporary containers containing hazardous chemicals brought on the mine site must be ____________.

6. MSDS stands for ________________________________.

7. Almost all mine products contain enough crystalline silica to require that the mine prepare an ______ and ______________ for its product.

8. The date the HazCom standard goes into effect is ________________ for mines with 6 or more employees and __________ for mines with 5 or less employees.

9. An unlabeled temporary portable container must be ____________ at the end of the shift.

10. The first step in developing a HazCom program is preparing a list of _______________ at the mine and securing copies of the ____ for each.

11. Containers of raw materials produced at the mine are exempt from the ______________ requirement.

12. A label must include the identity of a hazardous chemical and a brief summary of the chemical’s most serious ____________.

13. Consumer products need not be included on the company’s hazardous chemical list if they are used for the purpose the manufacturer intended and the use does not expose the miner more often and for longer periods of time than __________ use would.

14. Hazardous chemicals in temporary portable containers must either be labeled or ________________

15. The maximum size for a temporary portable container is ____________________.

16. The maximum number of miners who can use a temporary portable container is ________________.

17. MSDSs on the hazardous chemicals a miner is exposed to must be ____________________ to exposed miners.

18. How long must miners be notified before disposing of an MSDS? ________________.

19. What types of training must include HazCom training? ________________, ________________, ________________, and possibly ________________.

20. Initial HazCom training can be incorporated into what type of training? ________________.

21. You must provide independent contractors information about your ____________________.