Preparing a Generic Material Safety Data Sheet (MSDS) for Natural Stone

In order to ensure chemical safety in the workplace, information must be available about the identities and hazards of the chemicals. The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (HCS) requires the development and dissemination of such information:

- Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and
- Prepare labels and material safety data sheets (MSDSs) to convey the hazard information to their downstream customers.
- All employers with hazardous chemicals in their workplaces must have labels and MSDSs for their exposed workers, and train them to handle the chemicals appropriately.

This bulletin contains five sections:
2. Completing a generic MSDS for natural stone* — pages 2-3.
4. Frequently asked questions — pages 4-5.
5. MSDS — insert.

(*This text is a revision to that referenced on the technical bulletin published in 2000 using the same title.)

Section 1: Mineral and Chemical Nature of Natural Stone

Dimension stones are grouped into two basic categories based on the mineralogical and chemical nature of the stone to cause harm through dust inhalation, eye irritation and/or skin irritation, and the individual OSHA requirements for that particular stone type.

<table>
<thead>
<tr>
<th>Category A Stones</th>
<th>Category B Stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granite</td>
<td>Limestone</td>
</tr>
<tr>
<td>Granodiorite</td>
<td>Serpentine</td>
</tr>
<tr>
<td>Quartz Based Slate</td>
<td>Marble</td>
</tr>
<tr>
<td>Soapstone</td>
<td>Travertine</td>
</tr>
<tr>
<td>Slate</td>
<td>Onyx</td>
</tr>
</tbody>
</table>

Dust ingestion can be dangerous for some stones, while being merely a nuisance with others, depending on the characteristics of the stone to cause harm to those coming in contact with it. Dust from stones in Category A require adherence to a rigid schedule of fabrication (including field fixing for installation) and personal hygiene criteria, as OSHA considers the exposure to dust from fabricating to be a serious health hazard that may result in a disabling lung disease.

Dust from stone in Category B is considered to be a nuisance particulate, and the requirements for safety are significantly reduced (refer to Category Descriptions that follow).
Category Descriptions

Category A Stones: All stones in this category contain silica in the form of silica dioxide. The terms “crystalline silica” and “quartz” refer to the same thing. Quartz is a natural constituent of the Earth’s crust and is not chemically combined with any other substance. Granite, quartz monzonite, and granodiorite contain 70% to 77% silica, 11% to 13% alumina, 3% to 5% potassium oxide, 3% to 5% soda, 1% lime, 2% to 3% total iron, and less than 1% of magnesia and tilania. These minerals are known, to a lesser or greater degree, to be carcinogenic. Silica is the primary mineral. Exposure to silica-containing dust at any time poses a potential health hazard. The improper control and disposal of silica-containing dust today not only poses a hazard now, but it can continue to contaminate the work atmosphere as long as workers and equipment work or travel in the area. These stones should be worked under water to avoid creating dust. Dust produced from these stones can cause silicosis.

Category B Stones: These stones are composed primarily of calcite in the form of calcium carbonate (CaCO₃) or dolomite (calcium magnesium carbonate CaMg(CO₃)₂). Dolomite differs from calcite in the addition of magnesium ions. The magnesium ions are not the same size as calcium ions, and the two ions seem incompatible in the same layer. In calcite, the structure is composed of alternating layers of carbonate ions (CO₃²⁻) and calcium ions. In dolomite, the magnesium ions occupy one layer by themselves, followed by a carbonate layer which is followed by an exclusively calcite layer, and so on. This is why calcite stones react promptly with acids and vinegar, while dolomite does not. These stones may contain trace quantities of iron oxide, chlorite, epidote, or graphite, which give the stones their color. Some limestones may contain up to 5% silica, feldspar, clays and pyrite, while oolite limestone may contain chalk, coquina and other foraminiferan containing deposits.

Calcite is one of the most common minerals on the face of the Earth, comprising about 4% by weight of the Earth's crust. For our purposes in completing OSHA Material Safety Data Sheets, these elements are combined into Category B. OSHA considers dust from Category B stones to be nuisance particulate that can accumulate in the lungs. As Category B stones contain less than 1% crystalline silica, they are not as heavily cautioned, and it is recommended that these stones be worked in a manner that avoids the production of dust.

Section 2: Completing a Generic Material Safety Data Sheet (MSDS) for Stone

This information follows the format of the Material Safety Data Sheet published by the U.S. Department of Labor, Occupational Safety and Health Administration, OMB No. 1218-0072.

IDENTITY
List the stone variety (e.g. Blue Pearl Granite, Pennsylvania Black Slate, Georgia Cherokee Marble, etc.)

SECTION I
Manufacturer’s Name Y our business name
Address Y our business address
Emergency Telephone A telephone number where a responsible person may be contacted while employees are working. It must be different from your business telephone number. If an emergency number is not available, state NONE.
Telephone Number Y our business telephone number
Date Prepared T he date the form was prepared.
Signature of Preparer T he signature of the person preparing the MSDS.

SECTION II - Hazardous Ingredients/Identity Information

Hazardous Components
- Category A Stones
- Category B Stones
- Specific Chemical Identity SiO₂
- Common Name Silica
- Calcite/Dolomite
SECTION II (continued) Category A Stones Category B Stones
- OSHA PEL NA NA
- ACGIH TLV NA NA
- Other Limits NA NA
- % (Optional) 28 - 77 NA

Permissible Exposure Limit
- Granite, quartz-based stones 0.1 mg/m³
- Slate 0.1 mg/m³
- Soapstone 0.3 mg/m³
- Marble, Limestone, Onyx, Serpentine, Travertine 1.0 mg/m³

Note: Dimension stone is an inert material in its undisturbed or finished state. Only when natural stone is worked is there a potential for release of dust. (Include this statement here in both Category A and B). OSHA provides a sample calculation for crystalline silica exposure— consult with your local OSHA office for a copy.

SECTION III - Physical/Chemical Characteristics
Boiling Point NA NA
Vapor Pressure (mm Hg) NA NA
Vapor Density (Air=1) NA NA
Specific Gravity 2.0 to 4.0 2.0 to 4.0
Melting Point NA NA
Solubility in Water Not soluble Not soluble
Appearance Basic stone color Basic stone color
(red, black, green, etc.) (red, black, green, etc.)
Odor None None

SECTION IV - Fire and Explosion Hazard Data
Flash Point (method used) NA NA
Extinguishing Media NA NA
Special Fire Fighting Procedures NA NA
Unusual Fire & Explosion Hazards NA NA

SECTION V - Reactivity Data
Stability Stable Stable
Incompatibility (Materials to Avoid) Hydrofluoric acid All Acids
Hazardous Decomposition NA NA
Hazardous Polymerization Will Not Occur Will Not Occur

SECTION VI - Health Hazard Data
Dust creation during machining Dust creation during machining
Route of entry Inhalation Inhalation
- Skin None None
- Ingestion Yes None known
- Carcinogenicity Silicosis None known
Signs of exposure Chronic Silicosis signs and symptoms may include shortness of breath following physical exertion, severe cough, fatigue, loss of appetite, chest pain and fever.
Medical Conditions Generally
- Aggravated by Exposure None Known None Known
Emergency & First Aid Procedures
- Leave area until dust settles Leave area until dust settles
- Clean up Clean up
SECTION VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

<table>
<thead>
<tr>
<th>Category A Stones</th>
<th>Category B Stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Considered Hazardous Waste</td>
<td>Not Considered Hazardous Waste</td>
</tr>
</tbody>
</table>

Precautions to Be Taken in Handling and Storing

<table>
<thead>
<tr>
<th>Category A Stones</th>
<th>Category B Stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Toe Shoes where toes/feet are exposed to rolling falling objects</td>
<td>Safety Toe Shoes where toes/feet are exposed to rolling falling objects</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Other Precautions

<table>
<thead>
<tr>
<th>Category A Stones</th>
<th>Category B Stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

SECTION VIII - Control Measures

<table>
<thead>
<tr>
<th>Category A Stones</th>
<th>Category B Stones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust Control Equipment</td>
<td>Dust Control Equipment</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Local exhaust ventilation</td>
<td>Yes Recommended</td>
</tr>
<tr>
<td>Protective gloves</td>
<td>Not required for dust</td>
</tr>
<tr>
<td>Not required for dust</td>
<td>Not required for dust</td>
</tr>
<tr>
<td>Other protection, clothing or equipment</td>
<td>Safety Toe Shoes where toes/feet are exposed to rolling falling objects</td>
</tr>
<tr>
<td>Eye Protection</td>
<td>Eye Protection</td>
</tr>
<tr>
<td>Work/Hygienic Practices</td>
<td>See next section</td>
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<tr>
<td>See next section</td>
<td>See next section</td>
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</tbody>
</table>

Section 3: Work Practices

Recognize where silica dust may be generated and plan ahead to eliminate or control the dust at the source. The best industrial ventilation system or any other type of well-engineered system designed to improve the working environment and reduce the amount of dust generated can easily be defeated by bad work practices of the employees. Each person’s work practice is different by nature, experience, attitude, etc. The results of personal dust sample analysis carried out on two employees working side by side can be very different. It is very important when a dust control program is initiated in a fabricating plant or at a job site that the work practices of each employee be examined. The key to making employees “dust conscious” is information and training. Use a respirator approved for protection against crystalline silica-containing dust. Do not alter the respirator in any way. Note that beards or mustaches can interfere with the respirator’s seal to the face. A respiratory protection program should be in place and work areas should be regulated with warning signs to avoid accidental contamination.

**Housekeeping** is the most important of all dust-control methods. Simply cleaning up all possible emission sources as quickly as possible is the most effective dust-suppression technique. Practices such as vacuuming with HEPA filter and wet floor cleaning prevent high dust levels and improve already clean environments. These two methods will reduce dust by 50% to 75%. Because these cleaning methods are labor-intensive rather than capital-intensive, they can easily be used at both the stone shop and the construction site.

**Eating Facilities** Do not eat, drink or use tobacco in areas where there is dust containing crystalline silica. Wash hands thoroughly prior to eating.

**Clothing Change Area** Consider changing into disposable or washable work clothes at the job site. Shower (where available) and change into clean clothing before leaving the job site to prevent contamination of cars, homes and other areas.
Section 4: Frequently Asked Questions

The following questions are among those most often asked of the MIA Technical Department on the subject of MSDS.

Q: We provide over 100 varieties of natural stone. Must we have a specific MSDS for each stone?
A: No. If similar health hazards exist for a class or family of products, one MSDS can be used for all in that class. You would, for example, require separate MSDSs for granites and marbles, because the dust from a granite (silicate) carries a different health risk than that from marble.

Q: We don’t wish to disclose the source of our supply to our customer. Can we change the company name and address on their MSDS before we pass it on to our customer?
A: Yes, technically you can, as the document is not normally copyrighted, but you first must understand that you are assuming liability in doing this. The company listed on the MSDS is the responsible party for the accuracy of the information, and if errors or omissions are discovered, it would then be your problem and not your supplier’s problem. Also, you need to ascertain if you can provide the availability of emergency contact information and assistance. Our recommendation is to leave your supplier’s information on the document.

Q: Who can write an MSDS?
A: Anyone can write an MSDS. To determine whether you have the expertise to do so must be evaluated by you. If you are in doubt, we recommend seeking professional consultation services.

Q: Where can I send my MSDS sheet for approval?
A: Unfortunately, there is no service available for review and/or approval of MSDSs. OSHA will only audit them after a problem has developed.

Q: When I import a product from overseas, who is responsible for creating the MSDS?
A: As the importer, you are responsible. OSHA regulations only govern shipments within the United States, so you, as the importer, are the first party responsible for compliance.

Q: Some of my employees do not speak or read English. Must I have translated MSDSs available for them?
A: They must be adequately trained in the hazards of all products that they work with, and this training must be conducted in a language that they comprehend. The specific MSDS does not need to be translated for this to be done.

Q: Must I leave a copy of the MSDS for granite with the homeowner after I install their countertops?
A: No. MSDSs are for occupational hazards. As an example, if you purchase a bottle of window cleaner from your local hardware store for your own personal use, they are not required to provide you with an MSDS. But if you run a professional janitorial service and your employees use the window cleaner as a part of their job, your supplier is required to provide the MSDS and you are required to make it available to your employees.

Q: How long has this program been in place?
A: OSHA began requiring MSDSs in 1986.
**Q:** Which language must the MSDSs be in?

**A:** Each MSDS must be in English, although copies in other languages may also be maintained.

**Q:** Where should I keep MSDSs on file?

**A:** A central filing system at your business is recommended. It is also advisable to have a separate MSDS “Pack” on your company vehicles in the event of an accident. If there is a spill of any kind, you’ll have the MSDS “pack” on the scene for the HazMat at cleanup team.

**Q:** Do I include an MSDS with every shipment of material?

**A:** You are not required to do so, but administratively, it may be easier to verify compliance by simply sending it with each shipment. You are only required to send it with the first shipment of a particular material to a specific customer.

**Q:** My customer’s customer called me and demanded a copy of the MSDS, which I had previously provided when I originally shipped the product. Is this my responsibility?

**A:** No, it is your customer’s responsibility. MSDSs flow down the contractual chain. You are required to provide it to your customer. Your customer is required to provide it to their customer, and so on down the line. However, there’s also no harm in providing it to them, if you are certain that it is your product that has been resold to them.

**Q:** I have MSDS’ for products that we no longer use. Can I discard these?

**A:** No. You are required to retain these as records of chemicals that your employees were exposed to in your business.

**Q:** What is crystalline silica?

**A:** Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. All three forms may become respirable particles when workers chip, cut, drill, or grind objects that contain crystalline silica.

**Q:** Where can I learn more?

Section V — Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>Unstable</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stable</td>
<td></td>
</tr>
</tbody>
</table>

Incompatibility (Materials to Avoid)

Hazardous Decomposition or Byproducts

<table>
<thead>
<tr>
<th>Hazardous Polymerization</th>
<th>May Occur</th>
<th>Conditions to Avoid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Will Not Occur</td>
<td></td>
</tr>
</tbody>
</table>

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?

Health Hazards (Acute and Chronic)

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure

Medical Conditions Generally Aggravated by Exposure

Emergency and First Aid Procedures

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Waste Disposal Method

Precautions to Be Taken in Handling and Storing

Other Precautions

Section VIII — Control Measures

Respiratory Protection (Specify Type)

<table>
<thead>
<tr>
<th>Ventilation</th>
<th>Local Exhaust</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical (General)</td>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>

Protective Gloves

Eye Protection

Other Protective Clothing or Equipment

Work/Hygienic Practices