Material Data Sheet for Natural Stone

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.

Category A Stones

Granite, Granodiorite, Quartz Monzonite, Soapstone, Quartz based Slate

Category B

Limestone, Serpentine, Marble, Travertine, Onyx

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 ($CaCO_3$) or dolomite (calcium magnesium carbonate $CaMg[CO_3]_2$). 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 (CO_3) 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 colour. 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.

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 moustaches 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 labour-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

This Information has been collected from The Marble Institute of America and Finestone Granite and Marble have published this on their Behalf.

Natural stone products do not present a health hazard themselves however the process of fabrication and installation (including cutting, grinding, chipping, sanding, drilling and polishing) can release silica dust particles which if inhaled can be very hazardous to your health and cause silicosis.

Finestone Granite and Marble strongly recommends the implementation of all safe work practices prescribed by Workplace Health and safety Queensland in relation to the fabrication and installation process including respiratory protection, engineering and administration controls

Please log in to: www.worksafe.qld.gov.au for more information