SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

Safety Data Sheet
(SDS for Tile and Slab Products Made of Natural Stone)

Product Name	Recommended Use	Seller Name
Tile and slab products made of natural stone	Building material for flooring, countertops, wall cladding, and other architectural applications	Gem International, Inc.
Phone Number	**Address**	**Emergency Contact**
818-503-9848	12922 Raymer St, North Hollywood, ca 90605	818-503-9848

HAZARD IDENTIFICATION

Classification

Natural stone tiles and slabs are not classified as hazardous under OSHA regulations (29 CFR 1910.1200) in their solid forms

Hazardous Components

Carcinogenicity Category 1A (H350)	**Crystalline Silica (Quartz)**, which is commonly found in granite, marble, and other types of natural stone, is **classified** under GHS as **a Category 1 Carcinogen (H350: May cause cancer)** when airborne **dust is inhaled**, especially in occupational settings where **dust exposure occurs due to cutting, grinding, or polishing.**
 **Category 3 (H335)**	**Respiratory Tract Irritation** - May cause **respiratory irritation**
 **Category 1A (H372)**	**Repeated Exposure** - Causes **damage to lungs** through prolonged or repeated **esposure to dust**

Hazard Statements

WARNING!	**Any activity such as cutting, grinding, sanding or removal of natural stone tiles and slabs may produce airborne crystalline silica dust, which may cause respiratory issues or lung diseases if inhaled.**

Precautionary Statements

P260 & P261 **Avoid breathing dust**	**P280** **Wear appropriate personal protective equipment** (PPE) such as	**P271** **Work in well-ventilated areas**
P202 **Do not handle until all safety precautions have been read and understood**	**P270** **Do not eat, drink or smoke when using this product**	**P264** Wash thoroughly after handling

Major Reasons of Exposure to Crystalline Silica (CAS # 4808-60-7 / quartz, 14464-46-1 / cristobalite, 15468-32-3 / tridymite) Regarding Handling Tiles and Slabs

Exposure to silica in tiles and slabs primarily occurs during **activities like cutting, grinding, drilling, fabrication, removal, and installation**. **Dry cutting** and grinding release silica dust into the air, while drilling and fabricating slabs, especially those with high crystalline silica content like quartz, also produce harmful particles. **Demolition and removal of old tiles can create silica dust, and installation work with materials like grout and thin-set may involve silica sand.**

CLICK FOR MORE INFORMATION

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

Prolonged exposure in environments with silica dust can lead to cumulative health risks. The risk is highest without proper dust control measures or personal protective equipment. Wet cutting, grinding, good ventilation, and using respirators can significantly reduce the risk of inhaling silica dust.

Serious Short and Long-Term Effects of Crystalline Silica Exposure

Exposure to silica and other toxic materials in marble, limestone, travertine, granite, and quartzite can lead to serious health conditions, **primarily silicosis**. Symptoms of silicosis include persistent cough, shortness of breath, chest pain, weakness, fatigue, weight loss, loss of appetite, and fever. **Silica is also classified as a human lung carcinogen**, contributing to lung cancer, and **can lead to chronic obstructive pulmonary disease (COPD)**, which causes breathing difficulties, wheezing, and chronic cough. People with silicosis are more susceptible to **tuberculosis**(TB) and may experience **kidney disease or scleroderma**, which affects skin, blood vessels, and joints. **Acute silicosis** can develop quickly after high exposure and can lead to severe breathing problems, weakness, weight loss, and death. Symptoms may not appear until 10-20 years after exposure and can worsen even after exposure has stopped. The severity and onset of symptoms depend on the level and duration of exposure.

For further information

CDC - Health Effects of Occupational Exposure to Respirable Crystalline Silica	https://www.dir.ca.gov/OSHSB/Respirable-Crystalline-Silica-Non-Emergency.html
Cal/OSHA - Occupational Exposures to Respirable Crystalline Silica	https://www.dir.ca.gov/OSHSB/Respirable-Crystalline-Silica-Non-Emergency.html
California Department of Public Health (CDPH) -	https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/Pages/silicosis.aspx
OSHA - Silica, Crystalline Overview	https://www.osha.gov/silica-crystalline
California Department of Industrial Relations	https://www.dir.ca.gov/dosh/respiratory-silica-FAQ.html

COMPOSITION/INFORMATION ON INGREDIENTS

Marble: Marble is primarily composed of calcium carbonate (CaCO3), which typically makes up more than 90% of the rock. This compound is the main component of the shells of marine organisms such as mollusks and corals. The calcium carbonate in marble is derived from limestone or dolomite that has undergone metamorphism due to heat and pressure. Marble typically has **less than 5% silica content.**

Travertine: Travertine is a sedimentary rock primarily composed of calcium carbonate (CaCO3), which typically makes up more than 90% of its composition. The main minerals found in travertine are: Calcite and Aragonite. Travertine typically contains a very low percentage of **silica, generally less than 1% of its composition.**

Granite: Granite is an intrusive igneous rock primarily composed of three main minerals: Quartz: 20-60%, Feldspar: 65-90% , Mica: 5-15%. The chemical composition of granite typically includes: 70-77% Silica (SiO_2), 11-13% Alumina (Al_2O_3), 3-5% Potassium Oxide (K_2O), 3-5% Soda (Na_2O), 1% Lime (CaO), 2-3% Total Iron (FeO + Fe_2O_3), Less than 1% Magnesia (MgO) and Titania (TiO_2). The silica content in granite typically ranges from **5% to 50%,** with most granite containing between **70% and 77% silica** (SiO_2). The breakdown of the silica ratios reported in different sources: some reports indicate 5% to 50%. Some others indicate that the average silica content in granite is **approximately 72%.** Some sources report a narrower range, stating that granite contains around **40-50% silica**. A more specific breakdown indicates that lighter-colored granites tend to have higher silica content (25-45%), while darker granites typically contain less (0-15%). In the context of countertop materials, granite is reported to have about **45% crystalline silica content**.

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

Quartzite: Quartzite is a metamorphic rock primarily composed of quartz (SiO2). Its composition typically includes: **Quartz: 90-99%** of the rock's composition, Silica (SiO2): The primary chemical component, making up the majority of the rock In addition to quartz, quartzite may contain small amounts of other minerals and impurities: Feldspar, Mica, Chlorite, Amphibole, Iron oxide (Fe2O3), Magnetite, Rutile, Zircon, Rock fragments. The silica (SiO_2) content of quartzite is typically very high, **ranging from 90% to 99%** in most cases. Here are the key details: Quartzite is primarily composed of crystalline silica (quartz), with typical concentrations between 70% and 95%, depending on the specific sample or deposit. Some pure quartzite varieties, such as Crystallo White, Mont Blanc, or Taj Mahal quartzite, may contain up to 100% silica. The silica content makes quartzite one of the purest natural sources of silica, distinguishing it from other stones like granite (5-50% silica) or marble (less than 5% silica).

Composition Table

Stone Typ	Main Ingredients	Main Ingredient Ratio	Minor Ingredients	Minor Ingredient Ratio	Silica (SiO_2) Ratio	Crystalline Silica Ratio
Marble	Calcium carbonate ($CaCO_3$)	>90%	Quartz, Feldspar, Mica, Iron oxides	<10%	<5%	<1%
Limestone	Calcium carbonate ($CaCO_3$)	>90%	Dolomite, Quartz, Clay minerals, Organic matter	<10%	1-5%	<1%
Travertine	Calcium carbonate ($CaCO_3$)	>90%	Iron oxides, Quartz, Clay minerals	<10%	<1%	<1%
Granite	Quartz, Feldspar, Mica	Quartz: 20- 60%, Feldspar: 65-90%, Mica: 5-15%	Amphibole, Pyroxene, Garnet	<5%	70-77%	20-60%
Quartzite	Quartz	90-99%	Feldspar, Mica, Iron oxides	1-10%	90-99%	90-99%

Numbers are based on information available online.

For further information

The Science Behind Marble: Exploring Its Physical and Chemical Properties	The Science Behind Marble: Exploring Its Physical and Chemical Properties-Marble Polishing in London
Limestone - PUB2902	https://dnr.mo.gov/document-search/limestone-pub2902/pub2902
What is Travertine: Types and Colors	What is Travertine: Types and Colors | Dedalo Stone
Granite Composition and Colors	Granite Composition and Colors - Geology In
Quartzite	Quartzite: Metamorphic Rock - Pictures, Definition & More

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

FIRST AID

Inhalation: If someone is exposed to hazardous dust contains respirable crystalline silica through inhalation, the primary first aid measure is to **move them to fresh air immediately** and **remove any tight clothing**. If symptoms persist, **seek medical attention**. The key steps are to remove the person from exposure by moving them away from the hazard source to fresh air, loosen any tight clothing to help with breathing, and monitor their breathing. If they are not breathing normally, **begin CPR if necessary**. **Call emergency services or poison control** and, if available, **consult the Safety Data Sheet (SDS)** for the hazardous material for additional first aid instructions.

Eyes: If someone's eyes are exposed to a hazardous material, immediately **flush their eyes with water at an eyewash station for at least 15 minutes**, keeping the eyelids open to ensure thorough rinsing. Remove any contact lenses if present. Time is critical, so start flushing immediately. Use a designated eyewash station if available, gently pull the eyelids apart to rinse the entire surface, and maintain a steady stream of water. After flushing, **seek immediate medical attention** to evaluate the injury and receive appropriate treatment.

Skin: If someone's skin is exposed to a hazardous material, immediately **flush the affected area with cool running water for at least 15 minutes**, **removing any contaminated clothing if possible**. Use a gentle stream of water to rinse thoroughly and carefully remove clothing if the chemical has soaked through. **Seek medical attention after the exposure, especially if irritation persists or the exposure** is severe.

FIRE-FIGHTING MEASURES

Natural stone products are **not flammable or combustible.**

ACCIDENTAL RELEASE MEASURES

Not applicable for intact products.

For the dust generated during handling such as cutting or grinding, **use a dust mask or respirator to avoid inhalation of silica dust, avoid creating excessive dust, use wet methods or HEPA vacuum systems to prevent airborne dust. Do not sweep, do not use air to clean up the dust.**

SAFE HANDLING

To safely handle marble, limestone, travertine, granite, and quartzite tiles and slabs, **ensure workers are welltrained in proper handling techniques, tool use, and emergency procedures.** Always use suitable lifting equipment like cranes or hoists and inspect them regularly. Store slabs securely in racks to prevent tipping, maintaining adequate space between them. **Implement dust control measures** by using **wet cutting** methods, **local exhaust ventilation** (LEV) systems, and tools with **dust shrouds** and **HEPA-filtered vacuums**. Workers should wear proper PPE, including **safety goggles, gloves, N95 or N100 dust masks**, and steel-toed boots. Maintain a clean work environment by using **wet sweeping or HEPA-filtered vacuuming** and **regular housekeeping procedures**. **For cutting**, prefer **wet-edge milling machines** or stone routers over dry grinders. When handling slabs, stay clear of the fall shadow, lift slabs only as needed, and use forklifts within their rated capacity. Protect surfaces by using trivets, mats, and coasters. Perform regular maintenance by applying sealant every 1-2 years and cleaning with stone-safe cleaners.

CLICK FOR MORE INFORMATION

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

For further information	
Department of Industrial Relations (DIR) - Respirable Crystalline Silica Standards and Resources	https://www.dir.ca.gov/dosh/respiratory-silica-FAQ.html
OSHA – Hazard Analysis	https://www.osha.gov/sites/default/files/publications/silica-hazsrd-alert.pdf
OSHA-NIOSH - Worker Exposure to Silica during Countertop Manufacturing, Finishing and Installation	https://rb.gy/gra94g
Occupational Safety and Health Administration - Silica, Crystalline	https://www.osha.gov/silica-crystalline
Occupational Safety and Health Administration - 1910.1053 - Respirable crystalline silica.	https://www.osha.gov/laws-regs/regulations/standardumber/1910/1910.1053

EXPOSURE CONTROLS - PERSONAL PROTECTION

Personal protection equipment **(PPE)** is **crucial** for employees managing marble, limestone, travertine, granite, and quartzite tiles and slabs. **Respiratory protection**, including dust masks or respirators, is **essential** to **avert silica dust absorption**, particularly when engineering controls are inadequate. Eye protection, such **safety goggles or face shields**, defends against airborne debris, and **hearing protection**, such as **earplugs** or **earmuffs**, shields against noise from cutting machinery. Robust **gloves** are advised to avert lacerations, abrasions, and chemical exposure, while thermal waterproof gloves are advantageous in damp or frigid environments. Steel-toed, slip-resistant boots safeguard against falling items and slick surfaces, and waterproof aprons and rubber arm guards provide protection from liquids and lacerations. Proper attire safeguards employees from damp slurry and low temperatures, while hard caps must be utilized in areas with potential falling items. Knee pads are essential for activities necessitating extended kneeling. **Employers are required to do PPE danger assessments, choose suitable equipment, and deliver ongoing training on its usage and upkeep to guarantee worker safety.**

Respiratory Protection:	**N95 respirator**s or half-face respirators with a NIOSH rating (minimum N95) to protect against silica dust inhalation or or better with **APF 1000, HEPA, N100, R100, P100** filter
Eye Protection	**Safety goggles or face shields** to protect against flying debris and dust during cutting, grinding, or polishing
Hearing Protection:	**Earplugs or earmuffs** to prevent hearing damage from noisy cutting and grinding equipment
Hand Protection:	Durable **glove**s to protect hands from cuts, abrasions, and heavy lifting
Important Note for Employers:	**Employers should ensure that workers are trained in the proper use, maintenance, and limitations of PPE.** Respiratory protection **must comply** with OSHA's respiratory protection program requirements, including fit testing and medical evaluations.

CLICK FOR MORE INFORMATION

California Department of Industrial Relations
Division of Occupational Safety & Health
Publications Unit
SAFETY & HEALTH | FACT SHEET

CAL OSHA

For further information	
OSHA Regulations for Silica Exposure in Construction	https://www.dir.ca.gov/dosh/respiratory-silica-FAQ.html
Crystalline Silica in Stone - Granite Works	https://www.graniteworks.com.au/articles/crystalline-silica-in-stone/
NIOSH Engineering Controls for Silica Dust	https://pmc.ncbi.nlm.nih.gov/articles/PMC2708661/
OSHA's Respirable Crystalline Silica Standard for Construction:	https://www.osha.gov/sites/default/files/publications/OSHA3681.pdf
CDC Safe Work Practices for Silica	https://www.cdc.gov/niosh/silica/work/index.html

PHYSICAL AND CHEMICAL PROPERTIES AND STABILITY AND REACTIVITY

Occupational Exposure Limits Table (Based on OSHA Annotated Tables)

Substance	NIOSH REL (TWA)*** mg/m³	ACGIH TLV (TWA)**** mg/m³	OSHA PEL (TWA)* mg/m³	Cal/OSHA PEL** (TWA)***** mg/m³
Crystalline Silica (Quartz) (Respirable fraction)	0.05	0.025 mg/m³	0.05 (AL 0.025)	0.05 (AL 0.025)
Iron Oxide (Respirable)	5	10 (Respirable)	10	5
Limestone (Respirable)	N/A	3	5	5
Biotite	3	0.1	20 mppcf******	3
Feldspar	N/A	0.2	5	N/A

* OSHA PEL (Permissible Exposure Limit): The legal limit for exposure in the workplace under OSHA standards.

** CAL OSHA PEL: California's Occupational Safety and Health regulations for workplace exposure limits.

*** ACGIH TLV (Threshold Limit Value): Guidelines set by the American Conference of Governmental and Industrial Hygienists, which are not enforceable by law but are widely accepted as best practices for occupational exposure.

*** NIOSH REL (Recommended Exposure Limit): Recommended exposure limits provided by the National Institute for Occupational Safety and Health, which serve as guidelines for reducing occupational health risks.

***** TWA - 8-Hour Time Weighted Average

****** MPPCF - Million particles per cubic foot

For further information	
Toxicological Profile for Silica (ATSDR)	https://www.atsdr.cdc.gov/toxprofiles/tp211-c4.pdf
Crystalline Silica - Santos Report	https://www.santos.com/wp-content/uploads/2021/12/Crystalline-silica_November-2021.pdf
Material Safety Data Sheet (MSDS) for Crystalline Silica	https://louisville.edu/micronano/files/documents/safety-data-sheets-sds/silica/
Texas Commission on Environmental Quality (TCEQ) - Silica Crystalline 24-h ReV:	https://rb.gy/rd51bz
OSHA - Crystalline Silica Overview	http://www.osha.gov/silica-crystalline
OEHHA - Crystalline Silica (Respirable)	https://oehha.ca.gov/media/downloads/air/document/silicacrelfinal.pdf
Geology Science - Marble Properties and Uses	https://geologyscience.com/rocks/metamorphic-rocks/marble/

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

Impact of Physical Properties and Chemical Composition of Limestone on Decomposition Activation Energy	https://asianpubs.org/index.php/ajchem/article/download/25_15_105/8086/8130
Travertine	https://en.wikipedia.org/wiki/Travertine
Uses Of Granite: Definition, Physical & Chemical Properties	Uses Of Granite: Definition, Physical & Chemical Properties
Geology Science - Quartzite Rock Formation, Uses, Properties and Occurrence:	https://geologyscience.com/rocks/metamorphic-rocks/quartzite/
Silica Emergency Temporary Standard: Information for Employers	https://www.gramarstone.com/wp-

TOXICOLOGICAL INFORMATION

Primary Routes of Exposure	The primary route of hazardous exposure to marble, limestone, travertine, granite, and quartzite is **through inhalation of respirable crystalline silica dust**. This fine dust is produced during activities such as **cutting, drilling, grinding, carving, polishing** and **removing processes** of these stone materials.
Acute Health Effects	**Eye and respiratory irritation** from **dust exposure**. Acute silica exposure from high levels of respirable crystalline silica **(RCS) can cause severe health issues**. These include **acute silicosis** with symptoms like difficulty **breathing, chest pain, and weight loss**, which can lead to respiratory failure. It also causes **lung inflammation, pulmonary edema, and weakens the immune system**, increasing **infection risks**. While rare, acute silicosis is life-threatening and requires immediate medical attention, with proper engineering controls and PPE needed for prevention.
Mid-Long-Term Effects	**Silicosis is a progressive lung disease** that can develop after 10-30 years of exposure, causing **symptoms** like **shortness of breath and coughing**. It is **incurable** and potentially **fatal**. Silica exposure also increases the **risk** of **Chronic Obstructive Pulmonary Disease (COPD), lung cancer**, and **cardiovascular issues**, including pulmonary **heart disease**. Other health effects include a higher susceptibility to **tuberculosis, autoimmune disorders**, and kidney disease. The severity of these effects depends on the level and duration of exposure, with symptoms often appearing years later, even at safe exposure levels.
Carcinogen Status (Respirable crystalline silica)	Respirable crystalline silica is classified as a known **human carcinogen** by several organizations, including the International Agency for Research on Cancer **(IARC)**, the U.S. National Toxicology Program **(NTP)**, and the U.S. National Institute for Occupational Safety and Health **(NIOSH)**.

ECOLOGICAL INFORMATION

Natural stone products are generally considered non-toxic to the environment. Natural stone is a durable material that does not degrade easily in the environment.

DISPOSAL CONSIDERATIONS

When **extracting or discarding** tiles or slabs that contain silica, it is essential to implement measures to **reduce dust exposure**. Employ **wet cutting** techniques, such **water spraying systems** or **wet-edge milling machines**, to **minimize dust production**. Employ **dust mitigation strategies**, such as utilizing vacuums equipped with HEPA filters and enclosing workspaces with plastic sheeting. Utilize appropriate **personal protective equipment (PPE)**, comprising **respirators, safety goggles, gloves**, and **protective apparel**. For appropriate disposal, utilize multi-ply fabric fleece bags, refrain from overfilling, and meticulously place sealed bags in dumpsters. Utilize wet cleaning techniques or HEPA vacuums to sanitize the area. Engage specialists equipped with appropriate tools to minimize exposure, and consistently adhere to local restrictions for the disposal of silica-containing objects.

SAFETY DATA SHEET FOR NATURAL STONE TILE AND SLAB PRODUCT - GEM INTERNATIONAL INC.

For further information	
Cal/OSHA Permanent Silica Standard:	https://www.aiha.org/news/250109-california-standards-board-adopts-permanent-silica-standard
Cal/OSHA Emergency Temporary Standard (ETS)	https://www.californiaworkplacelawblog.com/2023/12/articles/calosha-2/cal-osha-standards-board-adopts-temporary-standardfor-silica/
California Department of Industrial Relations (DIR) News Release	https://www.dir.ca.gov/DIRNews/2024/2024-111.html
Silicosis Reporting and Compliance Requirements	https://erc.ucla.edu/latest-news/silicosis-emergency-temporary-standard/

REGULATORY INFORMATION

WARNING!

While the presence of silica in these materials doesn't ban their sale, it does require appropriate warnings to inform California consumers about potential exposures above certain threshold levels. Products made of marble, limestone, travertine, granite and quartzite **contain crystalline silica**, which is classified as a **carcinogen**. Also, crystalline silica content **in these products** have been previously introduced into U.S. commerce and is **listed in the Toxic Substances Control Act** (TSCA) Inventory of Chemicals in Commerce. Hence, it is subject to all applicable provisions and restrictions under **TSCA 40 CFR Section 721 and 723.250**

When these stone materials are **cut, ground, processed, or removed** they can release respirable crystalline silica particles, triggering **Proposition 65 warnings** which is listed as cause of cancer.

Based on **29 CFR Section 1910.1200** (Hazard Communication Standard), marble, limestone, travertine, granite, and quartzite **are not inherently dangerous in their finished forms**, but **they can pose health hazards when processed or worked on, particularly due to respirable crystalline silica exposure**. **Crystalline silica is classified as a health hazard** under the Hazard Communication Standard, specifically as a **carcinogen** and for **specific target organ toxicity with repeated exposure**. Hence, the standard requires chemical manufacturers and importers to classify the hazards of chemicals they produce or import, and all employers to provide information about these hazards to their employees.

For further information	
1910.1200 Hazard communication	https://www.govinfo.gov/content/pkg/CFR-2014-title29-vol6/pdf/CFR-2014-title29-vol6-sec1910-
OEHHA - Silica (crystalline, respirable)	https://oehha.ca.gov/chemicals/silica-crystalline-respirable
OEHHA - Proposition 65	https://oehha.ca.gov/proposition-65

IMPORTANT NOTE

This SDS is derived from publicly available sources, including federal and state organizations and other parties. It is presumed to be accurate and is provided in good faith. Nevertheless, no warranty, whether express or implied, is provided. Please consult the links provided for additional information.