

TechniStone®

A WILSONART COMPANY

GOOD PRACTICE GUIDE

relating to occupational health and safety
in a respirable crystalline silica dust
(RCS) environment



everlasting beauty

TechniStone®

EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA

This guide provides information and recommendations on health and safety issues to be considered in the cutting, grinding, polishing and installation of engineered stone material produced by Technistone.

TechniStone products are not hazardous when transported, shipped or used by the end consumer. The final TechniStone product is inert, hygienic and suitable for direct contact with food. There are no risks associated with the final hardened TechniStone product. The material is suitable for contact with food (certified by the American NSF organization), meets the strictest standards for indoor air quality (Indoor Advantage Gold, GreenGuard certification) and hygienic restrictions.



For more information about Technistone components and their associated risks please refer to the Technistone SDS.

This Guide includes current information about safety measures in an RCS environment as well as information that fabricators around the world have found to be relevant to their work.

The purpose of this Good Practice Guide is to assist you, the employer or owner of the fabrication plant, in creating a safe working environment for yourself and your employees.

HEALTH & SAFETY INFORMATION ABOUT RESPIRABLE FRACTION OF CRYSTALLINE SILICA DUST (RCS)

People at work are rarely exposed to pure crystalline silica. The dust they breathe in at the workplace is usually composed of a mixture of crystalline silica and other materials.

Crystalline silica is a common mineral found in the earth's crust. Materials like sand, stone, concrete, and mortar contain crystalline silica. It is also used to make products such as glass, pottery, ceramics, bricks, and engineered stone.

Respirable crystalline silica – very small particles (respirable fraction is under 10 microns) at least 100 times smaller than ordinary sand you might find on beaches and playgrounds – is created when cutting, sawing, grinding, drilling, and crushing stone, rock, concrete, brick, block, and mortar. Activities such as abrasive blasting with sand; sawing brick or concrete; sanding or drilling into concrete walls; grinding mortar; manufacturing brick, concrete blocks, stone countertops, or ceramic products; and cutting or crushing stone result in worker exposures to respirable crystalline silica dust.

Exposure to respirable crystalline silica can result in silicosis, chronic bronchitis, emphysema, lung cancer, kidney damage and scleroderma.

Silicosis is a commonly known health hazard and one of the world's oldest known occupational diseases caused by inhalation of crystalline silica dust. Silicosis can vary greatly in its severity, from "simple silicosis" to "progressive massive fibrosis".

Silicosis can result from exposure to RCS over many years, but very high short-term exposures can cause it to develop rapidly. It has three clinical forms: chronic, accelerated and acute. These forms are largely dependent on intensity of exposure and total cumulative exposure.

Future cases of silicosis can be reduced by implementing appropriate measures to reduce exposure to silica-containing dusts. Such measures include improved work practices, engineering controls, respiratory protective equipment and training programs.

PERMISSIBLE EXPOSURE LIMIT, ACTION LEVEL & THRESHOLD LIMIT VALUES

The European Standards Organization (CEN) and the International Standards Organization (ISO) have agreed standardized conventions for the health-related sampling of dusts or aerosols in workplaces (EN 481, ISO 7708).

The Permissible Exposure Limit (PEL)* is a safety limit set by each state/geographic region above which exposure to RCS is LEGALLY FORBIDDEN.

The Action Level (AL) is typically half the value of the PEL and is the airborne level of RCS that initiates certain required activities such as RCS monitoring and medical surveillance.

Threshold Limit Values (TLVs®) are recommendations made by the American Conference of Governmental Industrial Hygienists (ACGIH®), a scientific organization that advances occupational and environmental health.

According to ACGIH® exposure at or below the level of the TLV® does not create an unreasonable risk of disease or injury, assuming a daily 8-hour time-weighted average working day over a working lifetime. The ACGIH® TLV® for RCS is 0.025 mg/m³.

PELs for RCS are being reviewed and revised worldwide. On March 25, 2016, the USA Occupational Safety and Health Administration (OSHA) changed the PEL for RCS in the USA to 0.05 mg/m³ with an AL of 0.025 mg/m³.

You should consult with occupational health and safety experts regarding minimizing the exposure level in your workplace.

FOLLOWING IS THE CLASSIFICATION OF CRYSTALLINE SILICA:

HAZARD

H372: Causes damage to lungs through prolonged or repeated exposure (inhalation).

PREVENTION

P260: Do not breathe dust generated in the cutting, grinding and polishing processes.

P264: Wash face and hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this material.

P284: Wear respiratory protection for particles (P3).

FIRST AID MEASURES

P314: Get medical advice/attention if you feel unwell.

P501: Dispose of scrap material in accordance with local regulation.



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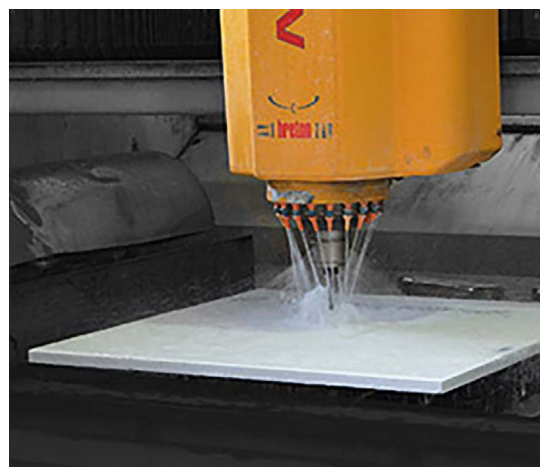
*PEL is sometimes referred to as the Workplace Exposure Standard (WES) or Workplace Exposure Limit (WEL).

TechniStone strongly encourages fabricators and installers to adhere to the recommendations contained in this Good Practice Guide to control exposure to respirable crystalline silica dust (RCS) and reduce health risks.

At minimum, fabricators and installers of TechniStone material are required to comply with all local laws and regulations pertaining to occupational health and safety. In addition to the information in this Guide, it is also recommended that fabricators and installers

of TechniStone become familiar with: the European Network on Silica (NEPSI) and its Good Practice Guide for the handling of silica; than with the Occupational Health and Safety Administration (OSHA) and National Emphasis Program for Crystalline Silica and with HANDLE STONES WITH CARE as well (it is a voluntary initiative promoting guidelines to protect workers from exposure to respiratory crystalline silica).

Visit www.nepsi.eu and www.osha.gov and www.handlestoneswithcare.info for more information.



PREVENTIVE MEASURES

EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA

These instructions provide information and guidance on:

- 1 Access to the workplace
- 2 Reducing respirable crystalline silica / Water-integrated cutting machinery and tools
- 3 Reducing respirable crystalline silica / Ventilation systems
- 4 Periodic maintenance and supervision / Cleaning methods
- 5 Other risks: cuts, projected particles, noise, handling loads
- 6 Installation of countertops
- 7 Personal Protective Equipment (PPE)
- 8 Dust monitoring
- 9 Hygiene standards
- 10 Training and information for workers
- 11 Health Surveillance

1 ACCESS TO THE WORKPLACE

Restrict access to work areas to authorized personnel only. Areas with hazardous dust must be clearly marked with appropriate signage:

DANGER!

RESPIRABLE CRYSTALLINE SILICA MAY CAUSE SEVERE HEALTH DAMAGES

WEAR RESPIRATORY PROTECTION IN THIS AREA AND FOLLOW SAFETY INSTRUCTIONS

AUTHORISED PERSONNEL ONLY

2 REDUCING RESPIRABLE CRYSTALLINE SILICA / WATER-INTEGRATED CUTTING MACHINERY AND TOOLS

All cutting, shaping, polishing and finishing of material should be done using water-integrated CNC machines, manual saw and manual tools. Use of these equipments significantly reduce the level of respirable crystalline silica. Dry cutting, grinding or polishing quartz surfaces generates very high RCS levels. Avoid using dry processing techniques whenever possible.

It is also advisable to use water curtains as a measure to reduce or eliminate the dust. Dust, which is wet, is less able to become or remain airborne. Respiratory Protective Equipment (RPE) are necessary even when using water-integrated tools.

CNC MACHINES

CNC machines such as waterjet cutters and automated sawing machines are faster, safer and more accurate than manual saws. The safety doors that prevent dust dispersal and distance the operator from the dust source must always be used.

MANUAL TOOLS

These tools are used for manual fabrication processes (e.g., drilling, cutting and polishing slabs) after initial cutting. When working with manual tools the fabricator is very close to the dust source. It is extremely important to implement the following safety procedures:

- Use only water-integrated manual tools.
- Control water spray using guards or plastic flaps.
- Set air and water pressure to achieve minimum dust generation.
- Use a half face respirator with P3 filter.

MANUAL SAWS

Even when equipped with water integration, manual saws used for automatic initial cutting of slabs (e.g., bridge saws) are less recommended because:

- the operator is close to the dust source.
- there are no safety doors.
- they are less accurate and slower than CNCs.
- worker exposure to respirable crystalline silica is generally higher than with CNCs.

When working with manual saws always use a half face respirator with P3 filter.

3 REDUCING RESPIRABLE CRYSTALLINE SILICA/ VENTILATION SYSTEMS

Proper ventilation is key to providing a safe and healthy workspace for yourself and your employees. Use a reputable exhaust ventilation supplier. Only use qualified engineers to carry out the design and the installation.

The design should include the following items: a hood, an enclosure or other inlet to collect and contain contaminants, ducts to remove contaminants away from the source, a filter or any other air cleaning device, normally placed between the hood and fan, a fan or other device to move air to provide the air flow, and finally other ducts to discharge the clean air outside the workplace.

Apply local exhaust ventilation at the generation source to capture the dust.

Tightly close the dust source to help prevent it spreading.

Local exhaust ventilation should be connected to a suitable dust extraction unit (e.g. a bag filter or cyclone).

Workers should not to stand between the source of exposure and the local exhaust ventilation; otherwise, they will be directly in the path of the contaminated air flow.

Please observe periodically the position of workers and train them.

Where possible, ensure that **the work area is not close to doors, windows or walkways** so as not to interfere with the local exhaust ventilation and to prevent dust from spreading.

Ensure that there is a clean air supply to replace the extracted air.

The ducts should be short and simple, avoid long sections of flexible ducts.

Discharge extracted air to a safe place away from doors, windows and air inlets.

GENERAL VENTILATION IN FACTORIES

Because the hazardous dust is very fine and may stay in the air for days it is important to have adequate general ventilation.

Ensure that the building is properly ventilated, if necessary using forced ventilation. Ensure the ventilation system does not move settled dust and that contaminated air does not spread to clean areas.

Dust suppression sprays (fine mist of air and water) may be used to prevent the generation of airborne dust throughout indoor and outdoor traffic routes or conveyors.

Emissions from dust extraction systems in buildings must comply with local environmental legislation.

4 PERIODIC MAINTENANCE AND SUPERVISION / CLEANING METHODS

Correct cleaning methods reduce the spread of RCS and contribute to a safer working environment.

Ensure equipment is maintained in good working condition as advised by the supplier's recommendations manual.

Clean the equipment on a regular basis, at least one time at the end of the shift.

Do not clean with a dry brush or using compressed air!

Do not allow dust/waste deposits to dry out before they are cleaned up. **Dry sludge should be cleaned by HEPA vacuum cleaning systems only.**

Ensure the local exhaust ventilation is maintained in good working condition in accordance with the supplier's or the installer's recommendations. Noisy or vibrating fans can indicate a problem.

Replace consumables (filters, etc) in accordance with the manufacturer's recommendations.

Do not modify any part of the system. If you do so, check with the supplier to ensure that the system retains the CE mark or make inspection and risk assessment by and licensed expert.



You should receive instructions for use and a diagram of the installed systems. You must receive a commissioning report showing the airflows at all inlets, the air speed in the ducts and the pressure index in the cleaner or filter.

Please contact the supplier for information on the expected performance of the local exhaust ventilation. Keep this information to compare with future test results.

At least once a week, visually inspect the equipment for signs of damage. If they are constantly used, check them more frequently. If used rarely, check before each use.

Keep records of inspections for the period of time required by the country's laws (recommended minimum five years).

Water pumps, hoses and nozzles should be kept in excellent operating condition and cleaned regularly. When working with water it is essential to avoid electrical risks by using ground fault circuit interrupters (GFCIs) and watertight, sealable electrical connectors for electric tools and equipment. Employees operating in wet areas should also be required to wear rubber boots.



CLEANING METHODS

Recommended methods of cleaning floors, walls and other surfaces with RCS are: low pressure wet hosing, wet sweeping and HEPA vacuum systems.

Because the hazardous dust is very fine and can go easily to the air and so may stay there for days it is important to have a comprehensive housekeeping program.

Clean the equipment every day, at least one time. Clean the workplace daily. Use walls and flooring surfaces that can easily be kept clean and that do not absorb or accumulate dust.

Clean floors and other surfaces on a regular basis. Clean also the entire warehouse structures and inlet roof.

Use wet or vacuum cleaning methods. Do not clean with a dry brush or using compressed air, it will boost the exposure to very high levels.

Clean up any spill immediately. **Do not allow dust / debris deposits to dry out before they are cleaned up.**

If vacuum cleaning systems are required for spill of large volumes of dust, they should be specially designed to avoid overloading and blocking.

When it is not possible to use wet or vacuum cleaning methods, and only dry cleaning with brushes can be carried out, ensure that workers wear appropriate personal protective equipment and that measures are taken to prevent crystalline silica dust from spreading outside the work area.

When necessary, to prevent dust from spreading between building levels, use solid floors and cover them with a wear-resistant material, colored to highlight dust contamination.

Control panels can be protected from dust by using a plastic barrier or similar membrane.

When using wet cleaning methods, provide an adequate number of correctly positioned water connection points.

Provide an adequate number of vacuum connection points when using a central vacuum cleaning system.

5 OTHER RISKS: CUTS, PROJECTED PARTICLES, NOISE, HANDLING LOADS

The fabrication of TechniStone material may involve some risk such as; blows and cuts with objects and tools, projected particles, noise exposure, vibrations and handling loads. Review the risk assessment results carried out by Health and Safety experts. Use the appropriate tools for each task and keep them in good working order.

Use the personal protective equipment recommended at all times: **dust mask, gloves, eye and ear protection and high visibility jacket in the area of tuck or forklift traffic.**

For slabs handlings use also the helmet. Insure that all A-frame are feet wit safety bars to avoid the falling of slabs at the moment of taking off or leaving down the slab. The safety bars must feet in all A-frame, in the warehouse and also in the trucks. Worker using crane, truck crane or forklift must be properly training.

Check formally on a daily basis crane, truck crane and forklift. Check periodically and according to manufacturer manual and regulations, with and expert inspector, crane, truck crane and forklift. Check periodically and according to manufacturer manual and regulations, with and expert inspector, electrical installations.

Use mechanical means to transport heavy parts or materials. As far as possible avoid handling or transporting weights over 20 kg or in awkward positions, also try to avoid repetitive movements.

6 INSTALLATION OF COUNTERTOPS

If no cutting, grinding, sanding or polishing of the countertops is performed during installation, no respirable crystalline silica should be released. **The worktop should be finished when it leaves the workshop so that no further work will be carried out on site.** Please take accurate dimensions of the kitchen. If significant dust-producing modifications are required upon installation, it is recommended to return the slabs to the plant to perform these processes.

BEFORE INSTALLATION

To prevent excessive dispersion of RCS at the installation site, before performing any dust-producing work the local heating/air-conditioning system should be shut down and sealed off; and surfaces should be covered with protective plastic sheets.

DURING INSTALLATION

If dust-producing modifications at the installation site are unavoidable, use water-integrated cutting or grinding tools and an integrated dust collector with a HEPA filter. Wherever possible, perform such work outdoors. As in every place where professional, technical work is carried out, no person other than the professional installer should be present near the working area during the performance of this work.

AFTER INSTALLATION

After completing an installation, thoroughly clean the work surface and remove all dust using wet methods and a HEPA filtered vacuum cleaner. Remove dust in sealed sacks according to local regulations.



7 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE should be used to protect workers in all parts of the fabrication plant, installation sites and related work areas. PPE includes general Personal Protective Equipment and Respiratory Protective Equipment (RPE).

Personal protective equipment (PPE) must comply with relevant local laws and regulations on the design and manufacture in relation to health and safety. All the personal protective equipment that the company provides must meet regulatory standards.

Employers must provide their workers with PPE in workplaces where health and safety hazards exist and ensure that they use it as required. Access to hazardous work areas should be restricted to authorized workers who are equipped with the necessary PPE. These areas should be clearly marked with appropriate signage to ensure that workers are aware of the hazards.

Respiratory protection for silica must meet regulatory standards. Note that facial hair reduces the effectiveness of a mask. When using PPE, provide employees with training on selection, use and maintenance of the equipment. If employees have to wear more than one PPE item, ensure that they are compatible with each other.

Check the effectiveness of respiratory protective equipment before use. Consult the supplier about the appropriate adaptation methods. Keep records of PPE provided. Provide clean storage facilities for PPE when not in use.

The following equipment (PPE) should be worn in the fabrication plant and at installation sites:

- Hair covering to contain long hair
- Safety helmet when handling and transporting
- Non-slip, steel-capped safety shoes
- Dust mask
- Safety glasses or other approved eye protection
- Earplugs when working in noisy areas
- Gloves for protection against chemicals or rough material
- In wet areas, aprons and steel-capped rubber boots in addition to the above

Choose the appropriate respiratory protective equipment (RPE) according to the respirable crystalline silica level, in consultation with an occupational health and safety professional:



WHEN TO USE A HALF FACE RESPIRATOR:

- When fabricating with wet manual tools in the fabrication plant
- When standing close to locations where RCS is created
- At the installation site if performing dust-producing modifications

WHEN TO USE POWERED AIR PURIFYING RESPIRATORS (PAPR):

- If the fabricator has facial hair
- If the protection achieved with any other respiratory protective equipment is not sufficient
- If exposure levels are thought to be very high

In these cases, use a PAPR type TH3 equipped with a P3 filter. Always consult your personal protective equipment supplier in order to make sure that the protection factor is adequate.

WHEN TO USE A DISPOSABLE MASK:

- Only in the case of short or occasional exposures to respirable crystalline silica (workers and visitors), e.g.:
 - when washing the floor and machinery with running water
 - near CNC machines that are water-connected to exhaust ventilation systems
- Masks marked with the letters NR (not reusable) are intended for single shift use. Masks marked with the letter R (reusable) are intended for more than single shift use, according to the supplier's instructions.
- Ensure that your disposable dust mask contains documentation that it conforms to standard EN 149:2001.

FILTER SPECIFICATIONS

RPE filters are classified as P1, P2 and P3; or N95, N99 and N100 in order of increasing filtration efficiency:

FILTER	PROTECTION FROM AIRBORNE PARTICLES
P1	80%
P2	94%
P3	99,95%
N95	95%
N99	99%
N100	99,97%

When using disposable masks use P3 or N95 filters; when using half face respirators use P3 or N95 filters or higher (N99, N100).

Using respiratory protective equipment does not exempt the employer from controlling the level of respirable crystalline silica or from bringing it to below the required Occupational Exposure Limit.

8 DUST MONITORING

The only way to quantify the amount of respirable crystalline silica present in the workplace atmosphere is to perform sampling of the air and analysis of the dust collected. Occupational exposure assessment is the process of measuring or estimating the intensity, frequency and duration of human contact with such contaminants.

There are two types of measurements commonly used:

- Personal
- Static

Both types of measurement can be used jointly as they are complementary. It is up to the experts designated by the employers and the employees' representatives to opt for the most adequate solutions, while respecting the national and European provisions.

General requirements for dust monitoring (taken from the European Standards EN 689 and EN 1232) are provided in the "Dust Monitoring Protocol", Annex 2 of the Agreement on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it. Producers and end users of products and raw materials containing crystalline silica are encouraged to adopt this protocol. Advice on organizing a dust-monitoring program can be sought from a competent occupational hygienist.



Main provisions of the NEPSI Agreement

OCCUPATIONAL EXPOSURE LIMITS

An occupational exposure limit value represents the maximum time-weighted average concentration of an airborne contaminant to which a worker can be exposed, measured in relation to a specified reference period, normally eight hours.

Currently there are many different types of occupational exposure limit value, defined by individual Member States of the European Union. These limits are all different and, in addition, cannot be compared directly.

In 2018, works involving exposure to respirable crystalline silica dust generated by a work process were included in Annex I of the European Carcinogens and Mutagens at Work Directive (Directive 2017/2398).

A European Binding Occupational Exposure Limit Value of 0.1 mg/m³ is set in Annex III for respirable crystalline silica dust.

9 HYGIENE STANDARDS

Personnel hygiene is another important factor in health protection as it reduces the worker's contact with RCS.

Provide storage facilities for workers' clothes. Clean clothes should be separated from work clothes. This area should have toilets, wash basins and showers as well as personal lockers. Workers should wash their hands and faces and take overalls off before eating. Define a specific and clean area where workers can prepare meals, eat and drink away from their workstation. Provide workers with an adequate supply of clean work clothes, including additional outfits. Workers who handle silica dust should wear overalls made of a fabric that prevents the absorption of dust. **Do not use compressed air to clean overalls.**

Smoking is hazardous to health and may increase health damage from RCS. Encourage your employees to stop smoking. Workers should not smoke inside the facility.

10 TRAINING AND INFORMATION FOR EMPLOYEES

Staff should receive training on risks associated with the fabrication of TechniStone material. Training should be conducted in the worker's mother tongue if possible.

New employees should attend a training session that addresses all health and safety aspects, including the company's safe working procedures for dealing with hazardous substances such as respirable crystalline silica.

Use a variety of training methods incorporating visual aids, videos, group discussions and handouts. Workers' knowledge should be assessed at the end of each session to verify that they have understood the training material. Refresher training sessions should be provided to keep workers up to date on health and safety policies and procedures.

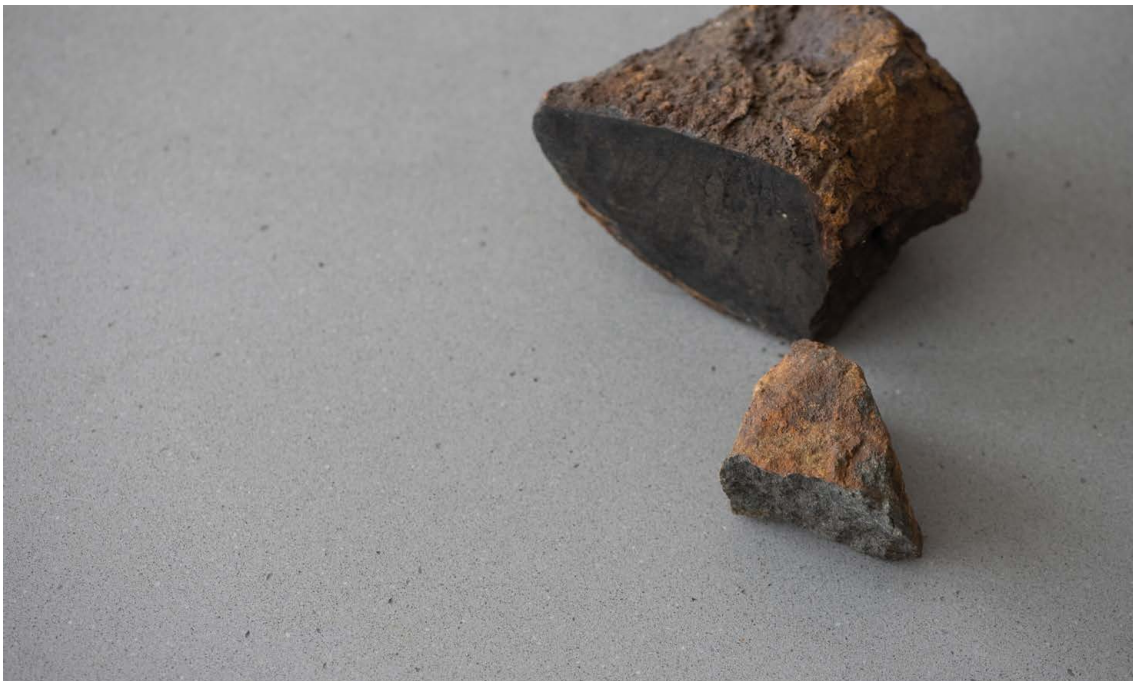
Give your workers information on the health and safety effects associated with respirable crystalline silica dust, noise or any other risk associated with their activity.

Give them information on:

- Good practices to use in the workplace and safe working procedures.
- When and how to use respiratory protective equipment (RPE) or other personal protective equipment (PPE).
- Dust monitoring programs and other planned corrective measures.
- Safety data sheets for the used products.
- Work equipment, machinery and tools affecting their work.
- In the event that an employee's measured personal exposure to respirable crystalline silica exceeds the relevant occupational exposure limit value, that employee must be provided with details of his/her personal exposure monitoring result if required by law.

Attendance at training sessions should be compulsory. Participation should be well documented and records should be kept.

Workers should be asked to provide feedback on each training session, which might help in the organization of future training sessions.



11 HEALTH SURVEILLANCE

The Company should keep a record of which positions are exposed to respirable crystalline silica. Specific health surveillance protocols should be implemented for those employees at risk.

This may include:

- Spirometry
- X ray
- High-resolution tomography

In some countries the health check has to be conducted before the hiring. Please be sure of the situation in your country.

As always, companies are required to comply with all applicable laws and regulations.

WARNING

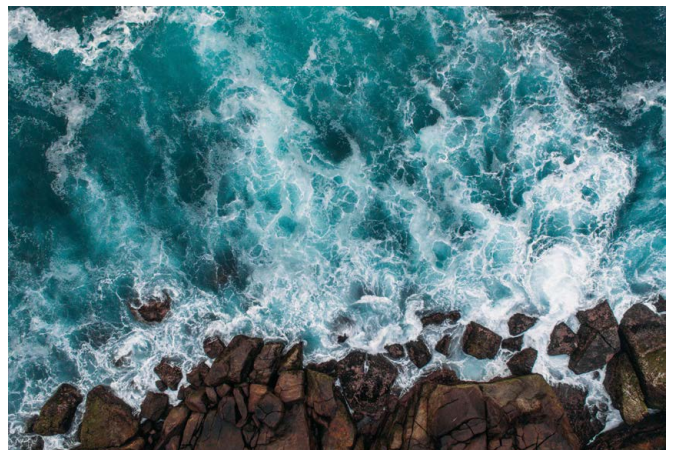
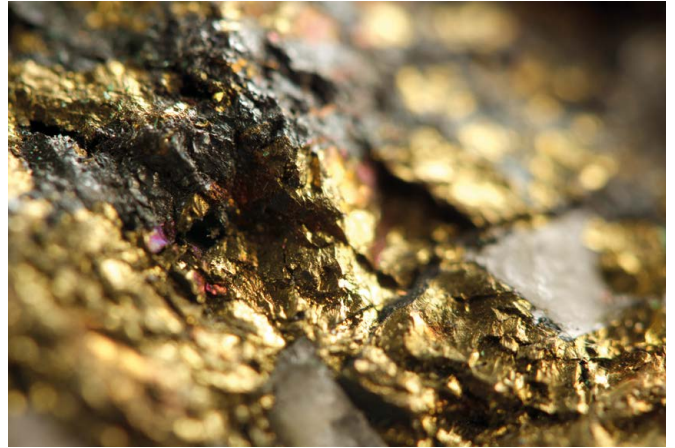
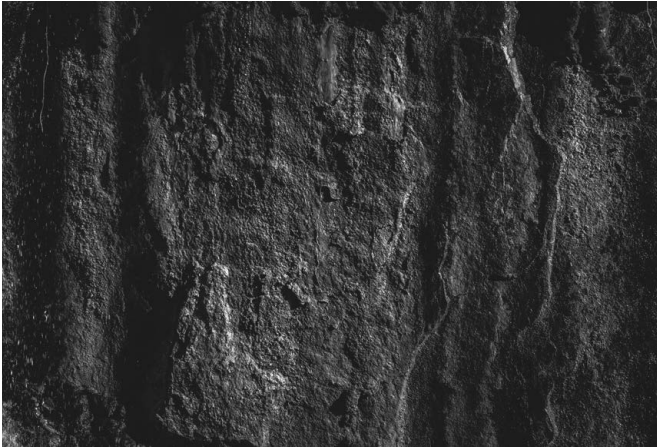
LEGAL COMPLIANCE AND SAFETY REQUERIMENTS

Fabricators and installers agree that it will, at all times, comply with all local and other applicable rules, regulations, ordinances and laws regarding the application, handling, storage, fabrication and disposal of all Technistone products. In particular Fabricators must perform periodic risk assessment of all jobs and take the appropriate measures to control the risk.

Fabricator acknowledges and understands that: fabrication of the materials, especially through dry cutting, emits air-borne particles, including respirable crystalline silica, that may cause silicosis or other respiratory diseases; and Technistone strongly recommends that fabricators and installers take all appropriate precautions, including wet cutting, wet grinding, wet milling and wet polishing, as it may reduce the risk of inhalation of air-borne particles and silicosis.

TECHNICAL ADVISORY SERVICES REPORT

The recommendations and advice given in this document are for information and guidance purposes only, intended for the implementing of organizational, technical and personnel measures as appropriate. In no case can they be construed to replace or substitute the legal obligations in health and safety matters as provided for in the legislation of each country; nor do they replace any other measures for risk evaluation, corrective action planning, specific technical advice or reports, training and information activities, preventive medicine, etc., which all correspond to the worker health and safety departments of companies or their outside consultants on these matters.





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