

CONTROL OF SILICA DUST IN CONSTRUCTION

Handheld Grinders for Mortar Removal (Tuckpointing)

The use of a handheld grinder to remove mortar when tuckpointing can generate *respirable crystalline silica* dust. When inhaled, the small particles of silica can irreversibly damage the lungs. This fact sheet describes control measures to minimize the amount of airborne dust when using handheld grinders to remove mortar between brick, stone, and concrete blocks as listed in Table 1 of the Respirable Crystalline Silica Standard for Construction, **29 CFR 1926.1153**.

Engineering Control Method: Vacuum Dust Collection System

Vacuum Dust Collection System (VDCS)

A VDCS can be used to capture the dust generated when removing mortar with a handheld grinder. Employers can comply with Table 1 in the silica standard by using a:

- Commercially available shroud on the grinding wheel designed to fit the grinder and wheel size.
- Vacuum that provides at least 25 cubic feet per minute (cfm) of airflow per inch of blade to capture dust at the point of grinding and removing mortar. For example, a 5" grinding wheel would require a rating of 125 cfm of air flow or more for effective capture.
- Vacuum equipped with a cyclonic pre-separator or filter- cleaning mechanism with a filter that has 99 percent or greater collection efficiency for respirable-sized particles.
- Vacuum exhaust hose capable of providing the airflow recommended by the tool manufacturer. A 1.5" to 2" diameter vacuum exhaust hose is typically adequate.

The grinder and dust collector must be operated and maintained in accordance with the manufacturer's instructions to minimize dust emissions. VDCSs are most effective when workers are properly trained and use good work practices, including:

- **Make sure to keep** the vacuum hose clear and free of debris, kinks, and tight bends.

- **Follow** the equipment manufacturer's directions on how to reduce dust buildup on the filter.
- **Change** vacuum-collection bags as needed. Do not overfill the bag.
- **Set** a regular schedule for maintenance and filter cleaning of the grinder and VDCS.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.



Photo courtesy of OSHA

Worker grinding mortar from between bricks (tuckpointing) with a handheld grinder equipped with a shroud and dust collection system using respiratory protection.

Proper handling of the handheld grinder is very important. Ensure the following occurs:

- **Place** one side of the shroud against the working surface before inserting the blade into the mortar joint. This directs the dust into the shroud as the blade cuts into the mortar joint.
- **Keep** the shroud tight against the working surface. This cuts down on dust that would otherwise escape from the collection system.
- **Move** the grinder counter to the direction of blade rotation to minimize escaping dust.
- **Back off** the cutting pressure of the blade a short distance before removing it from the slot so the vacuum can have enough time to clear any dust buildup.
- **Do not** move the grinder back and forth along the slot, as this will create a gap that increases dust escape. For better results, move the grinder in one direction, making a second pass only if necessary.
- **Use** only enough cutting force to operate the tool effectively and keep the leading tool edge flush against the working surface. Do not leave a large gap between the shroud and uncut mortar.

Use of Compressed Air. Unless there is a ventilation system that effectively captures the dust cloud, do not use compressed air or blowers to clean surfaces, clothing, or filters because it can increase exposure to silica. Instead, clean with a HEPA filter-equipped vacuum or by wet methods.

Indoors or in Enclosed Areas

Using a VDCS indoors or in an enclosed area may not reliably keep exposure low, so extra ventilation may be needed to reduce visible airborne dust. Extra ventilation can be supplied by using:

- Exhaust trunks
- Portable exhaust fans
- Air ducts
- Other means of mechanical ventilation



Worker is showing a handheld grinder equipped with shroud.

Ensure air flow is not impeded by the movements of employees during work, or by the opening or closing of doors and windows. Position the ventilation to move contaminated air away from the workers' breathing zones.

Respiratory Protection

In addition to using a VDCS, respiratory protection with a minimum Assigned Protection Factor (**APF**) of **10** is also required whenever a handheld grinder for mortar removal is **used for 4 hours or less** per shift. Respiratory protection with a minimum **APF of 25** is required whenever a handheld grinder for mortar removal is used for **more than 4 hours** per shift.

When respirators are required, employers must put in place a written respiratory protection program in accordance with OSHA's Respiratory Protection standard [29 CFR 1910.134](#).

Additional Information

For more information, visit www.osha.gov/silica and see the OSHA Fact Sheet on the [Crystalline Silica Rule for Construction](#), and the [Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction](#).

OSHA can provide compliance assistance through a variety of programs, including technical assistance about effective safety and health programs, workplace consultations, and training and education. OSHA's On-Site Consultation Program offers free, confidential occupational safety and health services to small and medium-sized businesses in all states and several territories across the country, with priority given to high-hazard worksites. On-Site consultation services are separate from enforcement and do not result in penalties or citations. To locate the OSHA On-Site Consultation Program nearest you, visit www.osha.gov/consultation.

Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards,

methods to prevent them, and the OSHA standards that apply to their workplace.

- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see [OSHA's Workers page](#).

How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.



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