

CONTROL OF SILICA DUST IN CONSTRUCTION

Handheld and Stand-Mounted Drills

The use of handheld and stand-mounted drills, impact and rotary hammer drills, and similar tools used to drill holes in concrete, masonry, or other silica-containing materials can generate *respirable crystalline silica* dust. When inhaled over time, the small particles of silica can irreversibly damage the lungs. This fact sheet describes dust controls that can be used to minimize the amount of airborne dust when using handheld and stand-mounted drills 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)

When using handheld or stand mounted drills to drill into concrete or other materials that contain crystalline silica, reduce exposure to silica dust by enclosing the drill in a commercially available shroud or cowling with a vacuum attached to capture the silica dust as it is generated around the drill bit.

A VDCS is commercially available in a variety of designs that include a dust collection device (shroud or cowling), vacuum, hose, filter, and filter-cleaning mechanism. These systems are typically available integrated into the tools or as add-on systems.

The VDCS must be equipped with a:

- Shroud or cowling sized to fit around the drill bit that is compatible with the manufacturer’s vacuum system;
- Vacuum that is rated to provide the airflow recommended by the tool manufacturer or greater to remove dust at the drilling point; and
- Air filter with a 99 percent or greater efficiency and a filter cleaning mechanism.

The drill and VDCS must be operated and maintained in accordance with the manufacturer’s instructions to minimize dust emissions. Focus on the following areas:

- **Keep** the vacuum hose clear and free of debris, kinks and tight bends.
- **Activate** any non-automatic filter-cleaning mechanism as needed to reduce dust buildup on the filter.
- **Change** vacuum-collection bags as needed.
- **Set** a schedule for filter cleaning and maintenance.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.

When necessary to clean the dust and debris from the drilled holes, a HEPA-filtered vacuum system must be used to capture the dust.



Photo courtesy of OSHA

Worker drilling into concrete with a rotary hammer equipped with a shroud and dust collection system.

Indoors or in Enclosed Areas

Using a VDCS indoors or in enclosed areas may not reliably keep silica exposures 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

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.

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.



Photo courtesy of the University of California, Berkeley (D. Rempel)

Worker drilling horizontal holes in a concrete wall using two stand-mounted drills equipped with two dust collectors. Note that the shrouds around drill bits, black hose, and dust collector are attached conveniently to the stand.

Respiratory Protection

When properly used, a VDCS can reduce airborne dust levels to below the permissible exposure limit (PEL) of $50 \mu\text{g}/\text{m}^3$, calculated as an 8-hour time-weighted average. Therefore, respiratory protection is not required when using drills equipped with a VDCS and a filter cleaning mechanism as specified earlier.

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.

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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