

CONTROL OF SILICA DUST IN CONSTRUCTION

Dowel Drilling Rigs for Concrete

The use of dowel drilling rigs, also known as gang drills, to drill holes in concrete can generate *respirable crystalline silica* dust. When inhaled, 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 dowel drills outdoors to drill concrete 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 drilling concrete outdoors, dowel drills need to be equipped with a VDCS. A HEPA-filtered vacuum must be used when cleaning dust from holes. Use of dowel drills indoors or in an enclosed space, or drilling materials other than concrete, is not covered by Table 1.

A VDCS can reduce silica exposures when using dowel drilling rigs. VDCSs include a dust collector (hood or shroud), vacuum, hose, and filter(s). The VDCS must include a:

- Filter with a 99% or greater efficiency in the vacuum exhaust with a filter cleaning mechanism; and
- Vacuum with a 1.5" to 2" diameter hose will typically provide enough air flow to capture dust at the bit and work surface.



Photo courtesy of NIOSH

Worker drilling horizontal holes in concrete slab with a dowel drilling rig. The shroud surrounds the drill steel where it enters the concrete and the dust collector is the canister on the right. Worker is wearing respiratory protection.

VDCSs are most effective when workers are properly trained on the processes and equipment, and use good work practices. Focus on the following:

- **Keep** the vacuum hose clear and free of debris, kinks and tight bends.
- **Change** vacuum-collection bags as needed. Do not overfill the bags.
- **Set up** a regular schedule for maintenance.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.

Compressed air should not be used to clean drilled holes unless it is used in conjunction with a HEPA filter-equipped vacuum.

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.

Respiratory Protection

In addition to using a VDCS, respiratory protection with a minimum Assigned Protection Factor (APF) of 10 is also required whenever dowel drilling rigs for concrete are used. When dowel drilling is conducted indoors or

in an enclosed space, Table 1 does not apply and employers must conduct an exposure assessment and may need to take additional action, including the use of respiratory protection with a higher APF.

Because respirators are required when doing drilling outdoors, 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.



U.S. Department of Labor



DSG FS-3930 12/2017