

## CONTROL OF SILICA DUST IN CONSTRUCTION

# Walk-Behind Milling Machines and Floor Grinders

Using walk-behind milling machines and floor grinders on concrete or other silica-containing materials 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 walk-behind milling machines and floor grinders as listed in Table 1 of the Respirable Crystalline Silica Standard for Construction, [29 CFR 1926.1153](#).

**Engineering Control Method:** Wet methods *OR* Vacuum Dust Collection Systems

Two methods for controlling dust when using walk-behind milling machines and floor grinders are: (1) an integrated water delivery system that continuously delivers water to the cutting surface, or (2) a commercially available vacuum dust collection system. In each case the milling machine or grinder must be operated and maintained in accordance with manufacturer's instructions to minimize dust emissions.

### Wet Methods

Use of wet methods effectively reduces the amount of silica dust that becomes airborne when milling or grinding silica containing materials because it controls the exposure at its source. The silica standard specifies the use of walk-behind milling machines and floor grinders that are equipped with an integrated water delivery system that continuously delivers water to the cutting surface.

Employers are responsible for keeping equipment in good condition to minimize dust and for training workers on how to use the equipment. Make sure to:

- **Check** that hoses are securely connected and are not cracked or broken.
- **Adjust** nozzles so that water goes to the grinding surface or cut point. Water flow rates must be sufficient to minimize the release of visible dust.

- **Ensure** an adequate supply of water is available.

Clean up any slurry produced to prevent the slurry from drying and releasing silica dust into the air. Wet slurry can be cleaned up using, for example, shovels or a wet vacuum equipped with a HEPA filter.



Photo courtesy of NIOSH

*Worker using water to suppress dust while operating floor grinder.*

**Electrical Safety.** Where water is used to control dust, electrical safety is a particular concern. Use ground-fault circuit interrupters (GFCIs) and watertight, sealable electrical connectors for electric tools and equipment on construction sites.

## Vacuum Dust Collection System (VDCS)

Commercially available VDCSs have been shown to reduce silica exposures. The VDCS must include a:

- Hood or shroud that is recommended by the tool manufacturer.
- Vacuum that is recommended by the tool manufacturer with enough suction to capture dust at the cutting point.
- Filter with a 99 percent or greater efficiency in the vacuum exhaust and a filter cleaning mechanism.
- 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.



Worker milling granite floor indoors with milling machine and vacuum dust collection system (background). Photo courtesy of OSHA

Proper operation should:

- **Keep** the vacuum hose clear and free of debris, kinks and tight bends.
- **Turn** the vacuum off and on regularly to reduce dust buildup on the filter, if it is not self-cleaning.
- **Change** vacuum-collection bags as needed or at least as often as recommended by the manufacturer.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.
- **Set** a regular schedule for maintenance as recommended by the manufacturer.

**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

When properly used, wet methods and a VDCS can effectively control exposure to silica dust. Therefore, Table 1 in the construction standard does not require the use of respiratory protection when operating walk behind milling machines and floor grinders using wet methods or a VDCS.

## Indoors or in Enclosed Spaces

When using walk-behind milling machines or floor grinders equipped with a VDCS indoors, or in an enclosed area where dust can build up, a HEPA-filtered vacuum must be used between passes to remove loose dust.

Using wet methods or 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

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.

## Additional Information

For more information, visit [www.osha.gov/silica](http://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](http://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](http://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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