

## CONTROL OF SILICA DUST IN CONSTRUCTION

# Heavy Equipment and Utility Vehicles Used for Grading and Excavating Tasks

Using heavy equipment and utility vehicles for earthmoving tasks such as grading and excavating does not in most cases generate hazardous levels of *respirable crystalline silica* dust. However, in dry conditions hazardous exposures can occur. This fact sheet describes methods to minimize the amount of airborne dust when using heavy equipment or utility vehicles for earthmoving tasks such as grading and excavating soil, as listed in Table 1 of the Respirable Crystalline Silica Standard for Construction, [29 CFR 1926.1153](#). A separate fact sheet covers dust controls for heavy equipment used for abrading, or fracturing silica-containing materials during demolition activities.

**Engineering Control Methods:** Enclosed cab (when only the operator is exposed) *OR* water sprays and/or dust surfactants (a dust suppressant)

The application of water and/or dust suppressants can help to reduce exposure to dust when operating heavy equipment or utility vehicles for tasks such as grading and excavating. If the equipment operator is the only worker engaged in the task, the employer can choose to apply water and/or dust suppressants to minimize dust emissions or can require the operator to stay within an enclosed cab. However, if there are other workers engaged in the task, then water and/or dust suppressants must be applied as needed to minimize their exposure to airborne dust.

### Wet Methods

Wet methods for heavy equipment and utility vehicle operators include the use of any method that will suppress dust emissions and be compatible to the job task. These include using:

- Tank trucks equipped with hoses and nozzles that spray water or other dust suppressants over large areas to wet the materials disturbed during earthmoving tasks, including haul roads and job sites in general.
- A worker who assists the operator by applying water or other types of dust suppressants to materials being moved.

- Large atomized misting devices.
- Spray equipment attached directly to the vehicle.
- Nozzles adjusted so that water spray is directed at the work areas where dust suppression is required.
- Timing the application of the water or other dust suppressants to ensure that the materials are still damp when they are disturbed.



Backhoe with enclosed cab.

Photo courtesy of International Union of Operating Engineers

Water must be applied at flow rates sufficient to minimize the release of visible dust. Too much water can create mud slurry that can cause hazards. Too little water will not effectively control dust emissions.

### Operator Isolation

When operators rely on enclosed cabs for protection against silica dust, the cab must:

- Be well-sealed and well-ventilated using positive pressure.
- Have door jambs, window grooves, power line entries and other joints that work properly and are tightly sealed.
- Have heating and air conditioning, so that operators can keep windows and doors closed.
- Use an intake air filter with a minimum MERV-16 rating (at least 95 percent efficient in the 0.3-10.0 µm range).
- Be kept free from settled dust by regular cleaning and maintenance to prevent dust from become airborne inside the enclosure.

Modern heavy equipment often comes equipped with enclosed, filtered cabs that meet the requirements of the silica standard in Table 1. Retrofit equipment is available for older equipment.

### Respiratory Protection

When properly used, an enclosed cab or wet methods can effectively control airborne silica dust. Therefore, Table 1 in the silica standard for construction does not require the use of respirators when wet methods are used for dust

suppression, or for the operator when operating heavy equipment or utility vehicles from within an enclosed cab.

### 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).

### 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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