

CONTROL OF SILICA DUST IN CONSTRUCTION

Crushing Machines

Using crushing machines at construction sites to reduce the size of large rocks, concrete, or construction rubble 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 crushing machines as listed in Table 1 of the Respirable Crystalline Silica Standard for Construction [29 CFR 1926.1153](#).

Engineering Control Method: Wet Methods **AND** Operator Isolation

The use of water sprays or mists for dust suppression at the points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points) can control dust exposures when operating crushers. In addition, operator isolation through the use of a remote control station or ventilated booth that provides fresh, climate-controlled air to the operator must also be used to control exposure when operating crushers at construction sites.



Crushing machine being loaded with construction debris by an excavator.

Photo courtesy of Screen Machine Industries

Wet Methods

Wet spray methods can greatly reduce the silica exposure levels of operators and laborers who work near crushers, tending the equipment, removing jammed material from hoppers, picking debris out of the material stream, and performing other tasks.

The crusher must be operated and maintained in accordance with the manufacturer's instructions to minimize dust emissions. Make sure to:

- **Locate** nozzles upstream of dust generation points.
- **Position** nozzles to thoroughly wet the material.
- **Ensure** the volume and size of droplets is adequate to sufficiently wet the material (optimal droplet size is between 10 and 150 µm).
- **Ensure** nozzles provide complete water coverage but are not so far that the water is carried away by wind.

Operator Isolation

Operator isolation for crushing machines includes using either an enclosed booth or a remote control station. Operators using crushing machines with enclosed cabs can limit their silica exposure by staying inside the cab during crushing operations. The enclosed 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 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 enclosed booth.

An alternative method for operator isolation is to use a remote control station located a sufficient distance upwind to limit exposure to silica containing dust.

Respiratory Protection

When properly used, water sprays with either ventilated booths or remote control stations can in most cases effectively limit exposure to airborne dust. Therefore, Table 1 in the silica standard for construction does not require use of respiratory protection when using crushers at construction sites when the machines are equipped with water sprays along with either control booths or remote controls stations.

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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