OSHA® FactSheet

Controlling Silica Exposures in Construction While Operating Rotary Hammers

Silica is a mineral that is found in stone, soil and sand. It is also found in concrete, brick, mortar and other construction materials. Breathing in silica dust can cause silicosis, a serious lung disease. Using rotary hammers or similar tools to drill small holes in concrete, masonry blocks, or tiles creates dust that can expose workers to hazardous levels of airborne silica. This fact sheet describes ways to reduce workers' exposures to silica when using rotary hammers to drill concrete and other silica-containing materials.

Silica Dust Control Methods

Vacuum dust collection systems are the primary way to control dust when using rotary hammers.

Wet methods reduce exposure to silica dust with pneumatic rock drills but are not meant to be used with most electric rotary hammers.

Rotary hammers can produce high levels of silica dust, especially when used directly overhead. (Photo courtesy of New Jersey Department of Health and Senior Services, Silica Surveillance Project).

Vacuum Dust Collection Systems

Vacuum dust collection systems (VDCSs) are available for many types of handheld drills, usually as add-on systems. The drill bit is surrounded by a shroud that is attached to a vacuum to collect dust and bits of concrete. VDCSs are available in a variety of designs and should include a dust collection device (shroud), vacuum, hose and filter(s).

Rotary hammer with built-in VDCS including HEPA filter. Note the shroud, hose and vacuum. (Photo courtesy of DeWalt. The equipment shown in this picture is for illustrative purposes only and is not intended as an endorsement by OSHA of this company, its products or services).

Remember to:

- Use a shroud sized to fit the hammer's drill bit and compatible with the manufacturer's vacuum system.

- Use a vacuum with enough suction to remove dust at the drilling point.
- Use a high-efficiency particulate air (HEPA) filter in the vacuum exhaust.
- Use a 1½- to 2-inch diameter vacuum exhaust hose or a hose size that is recommended by the tool manufacturer.

VDCSs work best when workers are properly trained and use good work practices. For best results:

- **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.
- **Set up** a regular schedule for filter cleaning and maintenance.
- **Avoid** exposure to dust when changing vacuum bags and cleaning or replacing air filters.

Compressed Air
Do not use compressed air to clean surfaces, clothing, or filters because it can increase your exposure to silica. Clean only with a HEPA-filtered vacuum or by wet methods.

Wet Methods

Wet methods are generally not appropriate for use with electric rotary hammers; however, pneumatic drills can be used for wet drilling and some come equipped with water-feed capability. Wet drilling is commonly used in the tunneling and mining industries to limit dust getting in the air.

To stop dust, keep the water-supply equipment, including pumps, hoses and nozzles, in working order. Make sure that enough water is available for the job.

Electrical Safety
Use ground-fault circuit interrupters (GFCIs) and watertight, sealable electrical connectors for electric tools and equipment on construction sites. These features are particularly important in wet or damp areas, such as where water is used to control dust.

Respiratory Protection

When dust controls are used, most rotary hammer drilling should not require respirators. When VDCSs and wet methods are not feasible or do not reduce silica exposures to OSHA's permissible exposure limit, workers need respiratory protection. Where respirators are required, employers have to put in place a written respiratory protection program in accord with OSHA's Respiratory Protection standard. It must include the following:

- How to select a respirator;
- Fit testing;
- Directions on proper use, maintenance, cleaning and disinfecting;
- Medical evaluations of workers; and
- Training.

For more information on how to determine proper respiratory protection, visit OSHA's web site at www.osha.gov.

For more detailed information on controlling silica exposures when using rotary hammers, refer to OSHA Publication 3362, *Controlling Silica Exposures in Construction*.

DSG FS-3630 02/2013