FACT SHEET

HEALTH, SAFETY, AND RISK MANAGEMENT
UNIVERSITY OF MINNESOTA
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Respirable Crystalline Silica

Crystalline silica is a basic component of soil, sand, granite, and many other minerals. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two other forms of crystalline silica. All three forms may become respirable particles when workers chip, cut, drill, or grind materials that contain crystalline silica.

How Workers are Exposed to Crystalline Silica

Exposure to respirable crystalline silica can occur during common construction tasks such as using masonry saws, grinders, jackhammers, drills, and powered chipping tools; operating crushing machines; using heavy equipment for demolition; and during abrasive blasting. Other potential exposures may occur during research tasks such as grinding, sawing, cutting, drilling, and crushing stone, rock, soil, concrete, brick, ceramics, etc.

Health Hazards Associated with Inhalation of Respirable Crystalline Silica

Chronic long term health effects from silica exposure include:

- Lung cancer
- Silicosis—a disabling, non-reversible and sometimes fatal lung disease
- Non-malignant respiratory diseases such as chronic bronchitis
- Kidney disease including nephritis and end-stage renal disease

Occupational Exposure Limits

OSHA established the Respirable Crystalline Silica standard (29 CFR 1910.1053, 1926.1153) for employees who are potentially exposed to respirable crystalline silica. The OSHA 8-hour permissible exposure limit (PEL) is 50 $\mu g/m^3$ and the action limit is 25 $\mu g/m^3$. Employees in work areas where there is potential for exposure to crystalline silica must be evaluated by Health, Safety, and Risk Management (HSRM) to determine whether adequate controls and procedures are in place to limit exposure. Construction related operations that may generate respirable crystalline silica must adhere to the requirements in Table 1 of the Respirable Crystalline Silica Exposure Plan.

Training

Employees who may be exposed to respirable crystalline silica must receive Hazard Communication training annually which contains information on respirable crystalline silica including the following:

- The health hazards associated with exposure to respirable crystalline silica
- Specific tasks in the workplace that could result in exposure to respirable crystalline silica
- Specific measures the University has implemented to protect employees from exposure to respirable crystalline silica including engineering controls, work practices, and respiratory protection
- The purpose and description of the medical surveillance program
- The contents of the Respirable Crystalline Silica Program

Revised: February 2023

What can Employees do to Protect Against Exposure to Crystalline Silica

HSRM has established a Respirable Crystalline Silica Exposure Control Plan which provides guidance on how to protect employees conducting respirable crystalline silica generating operations. Listed below are important measures to take while working with crystalline silica containing materials.

- Utilize engineering and work practice controls, where feasible, such as local exhaust ventilation (LEV), shrouds, enclosures, HEPA vacuums, and water sprays.
- Where necessary to further reduce exposures below the PEL, use personal protective equipment (PPE)
- Wear a NIOSH certified respirator if respiratory protection is required. If you are unsure if a respirator is required, contact Health, Safety, and Risk Management. Do not wear a tight-fitting respirator with facial hair that prevents a good seal between the respirator and face.
- Wear disposable or washable work clothes and shower if facilities are available. Vacuum dust from your clothes or change into clean clothing before leaving the work site.
- Never dry sweep or use compressed air to clean work area. Use dust down if sweeping is necessary or a HEPA filtered vacuum.
- Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- Be aware of the health hazards related to exposures to crystalline silica. Smoking enhances lung damage caused by silica exposures.
- Do not eat, drink, smoke, or apply cosmetics in areas where crystalline silica dust is present. Wash your hands and face outside of dusty areas before performing any of these activities.

Available Services

To request exposure monitoring for employees working with or disturbing crystalline silica containing materials, please contact HSRM at (612) 626-6002 or hsrm@umn.edu for scheduling prior to performing the work.

Additional Resources

OSHA Safety and Health Topics Crystalline Silica
NIOSH Workplace Safety and Health Topics Crystalline Silica
OSHA Construction Silica Standard 29 CFR 1926.1153
OSHA General Industry Silica Standard 29 CFR 1910.1053