

Hierarchy of Controls for Silica Exposure

Use the hierarchy of controls as your primary guide for reducing silica exposure. Start with the most effective measures and only rely on PPE when higher-level controls are not sufficient. Controls should be selected based on the specific tasks and risks on your site and implemented in a practical, planned way.

Employers have a legal responsibility to identify high-risk tasks and provide controls that protect workers from silica exposure.

Below are examples of some common controls that may be used to reduce silica exposure.

1. Elimination

Eliminating exposure can be simple and effective.

- Sufficient and continued wetting during long cuts can eliminate airborne dust in many scenarios.
- Automation can allow for the task to be completed without exposing the worker to any hazards.
- Remote operating technology can also keep workers in a safe location while high risk, high exposure work takes place.

2. Substitution

Silica-containing materials are often difficult to substitute; tools and equipment are not. Substitution reduces exposure levels but may not eliminate dust entirely.

- Saws equipped with water tanks and hoses
- Coring companies with proper equipment vs. chipping and cutting
- Upgrading to heavy equipment with pressurized cabs

3. Engineering Controls

Reducing dust at the source through physical design changes.

- Localized ventilation systems
- Facility design improvements for fixed locations
- Water curtains
- Dust suppression systems

4. Administrative Controls:

Company policies and work practices that help limit exposure:

- Silica awareness training
- Training on specialized PPE and respirator use
- Policies like keeping cab windows closed in exposure areas
- Work rotation or scheduling changes (e.g., moving floor grinding to night shift)

5. Personal Protective Equipment (PPE)

PPE only protects the worker wearing it and should not be the first or only control. At this stage, the hazard has already reached the worker—PPE helps reduce the amount of exposure, but does not remove the risk. PPE relies on proper selection and correct use, and some protection levels require quantitative fit testing.

- PAPRs and tight-fitting respirators (fit testing required)
- Respirator selection based on level of required protection

