SILICA SAFETY TRAINING

Protecting Workers from Respirable Crystalline Silica

OSHA 29 CFR 1926.1153 Compliance Training

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What is Crystalline Silica?

Crystalline silica is a common mineral found in the earth's crust and in many construction materials.

- One of the most common minerals on earth
- Found in sand, stone, rock, concrete, brick, block, and mortar
- Also in manufactured products: countertops, tiles, glass
- Becomes hazardous when cut, ground, drilled, or crushed
- Creates tiny particles that can be inhaled deep into the lungs

Respirable crystalline silica particles are very small — about 100 times smaller than ordinary beach sand. You cannot see them with the naked eye.

Health Hazards of Silica Exposure

Breathing in silica dust can cause serious, permanent, and even fatal lung disease.

Silicosis Incurable lung disease caused by silica particles scarring lung tissue. Makes breathing difficult. Can be fatal.	**Lung Cancer** Silica exposure significantly increases the risk of developing lung cancer, even in non-smokers.
COPD Chronic Obstructive Pulmonary Disease. Progressive breathing problems that worsen over time.	**Kidney Disease** Silica can damage the kidneys and has been linked to chronic kidney disease and kidney failure.

■ These diseases may not appear until years after exposure. ■
Damage to your lungs is permanent and cannot be reversed.

Silica Exposure: By the Numbers

2.3	2,300+	50
MILLION workers exposed to silica in the U.S.	DEATHS per year from silicosis in the U.S.	µg/m³ OSHA Permissible Exposure Limit

Construction workers have the highest rates of silicosis — 60% higher than other industries.

Where is Silica Found on the Jobsite?

High Silica Content	Moderate Silica Content
• Sandstone (70-90%) • Granite (25-40%) • Slate (20-40%) • Sand and gravel • Concrete and mortar • Fiber cement board	• Brick (up to 30%) • Concrete block • Asphalt (with rock) • Tile and terrazzo • Some drywall compounds • Manufactured stone

If you're cutting, grinding, drilling, or demolishing — assume there's silica!

Tasks That Generate Silica Dust

- Cutting concrete, stone, or masonry with power saws
- Grinding or polishing concrete surfaces
- Drilling into concrete, brick, or block
- Jackhammering or chipping concrete
- Tuck pointing or mortar removal
- Mixing dry concrete, mortar, or grout
- Demolition of concrete or masonry structures
- Abrasive blasting with sand

OSHA Silica Requirements

OSHA's Silica Standard (29 CFR 1926.1153) requires employers to protect workers from silica exposure.

Exposure Limit	Requirement
PEL: 50 µg/m³	Permissible Exposure Limit — Must not exceed this level (8-hr average)
Action Level: 25 µg/m³	Triggers medical surveillance for workers exposed at or above this level

Your Employer Must:

- Use engineering controls to reduce dust exposure
- Provide respiratory protection when needed
- Offer medical exams for workers who wear respirators 30+ days/year
- Train all workers on silica hazards and protections

Control Method #1: Water Suppression

Water is one of the most effective ways to control silica dust. It keeps dust from becoming airborne.

- Saws, drills, and grinders should have integrated water delivery
- Water must flow continuously to the cutting/drilling surface
- Keeps the material wet so dust particles can't float in the air
- Check water systems before each use
- Make sure you have adequate water supply for the task

TIP: If you see visible dust while cutting or grinding, the water isn't working properly. Stop and check the water delivery system.

Control Method #2: Vacuum Dust Collection

HEPA-filtered vacuums capture silica dust at the source before you can breathe it in.

- Vacuum systems attach to grinders, drills, and other tools
- Shroud or hood captures dust right where it's created
- Must use HEPA filter (High-Efficiency Particulate Air)
- Check that vacuum is working before starting the task
- Empty containers carefully to avoid releasing dust

Vacuum systems must maintain proper airflow — check manufacturer specs!

NEVER Do These Things!

■ NEVER dry sweep silica dust
Sweeping kicks dust back into the air where you breathe it

■ NEVER use compressed air for cleaning
Blowing creates a huge dust cloud that spreads everywhere

■ NEVER operate tools without required controls
Water or vacuum systems must be working before you start

■ NEVER eat, drink, or smoke in dusty areas
You can swallow silica dust on your hands and food

Respiratory Protection

When engineering controls aren't enough, you may need to wear a respirator.

Respirator Type	Protection Level	When Used
N95 Filtering Facepiece	APF 10	Low to moderate exposure tasks
Half-Mask with P100	APF 10	Reusable option for routine tasks
Full Facepiece with P100	APF 50	Higher exposure tasks
PAPR (Powered Air)	APF 25-1000	Extended work, high exposure

- You must be medically cleared before wearing a respirator
- You must be fit-tested annually for tight-fitting respirators
- Inspect your respirator before each use

Proper Housekeeping

Good housekeeping prevents silica dust from building up and getting into the air.

DO:

- ✓ Use wet methods or HEPA vacuum for cleanup
- ✓ Clean work areas at least daily
- ✓ Dispose of dust in sealed containers
- ✓ Wash hands and face before eating or drinking
- ✓ Change out of dusty clothes before going home

DON'T: Dry sweep, use compressed air, or let dust accumulate!

Medical Surveillance

If you wear a respirator for silica protection 30 or more days per year, you are entitled to medical exams.

Medical Exams Include:

- Medical and work history review
- Physical examination
- Chest X-ray
- Lung function test (spirometry)
- TB testing (if recommended)

Your Rights: Medical exams are provided at no cost to you, during work hours. Results are confidential between you and the doctor.

Your Responsibilities

You play a critical role in protecting yourself and your coworkers from silica exposure.

- Use engineering controls (water, vacuum) as required
- Wear respiratory protection when assigned
- Follow work practices and housekeeping rules
- Report any problems with controls or equipment
- Participate in medical surveillance if eligible
- Never remove or bypass dust controls
- Attend all required training

Key Takeaways

1	**Silica is Dangerous** Causes permanent lung damage, cancer, and death
2	**Controls Work** Water and vacuum systems keep you safe when used properly
3	**Never Dry Sweep** Always use wet methods or HEPA vacuum for cleanup
4	**Wear Protection** Use respirators when required and ensure proper fit
5	**Speak Up** Report any problems with equipment or controls immediately

Knowledge Check

1. What is the OSHA Permissible Exposure Limit for silica?

[ ] A. 100 µg/m³

[ ] B. 50 µg/m³

[ ] C. 25 µg/m³

2. Which cleaning method is PROHIBITED for silica dust?

[ ] A. Wet mopping

[ ] B. HEPA vacuuming

[ ] C. Dry sweeping

3. What type of filter must vacuums have for silica dust?

[ ] A. Standard paper filter

[ ] B. HEPA filter

[ ] C. Foam filter

Knowledge Check (Continued)

4. Name two health effects of silica exposure:

_____

_____

5. What should you do if dust controls aren't working?

[ ] A. Keep working anyway

[ ] B. Stop and report it to your supervisor

[ ] C. Try to fix it yourself

Answers: 1-B, 2-C, 3-B, 4-Silicosis/Lung cancer/COPD/Kidney disease (any two), 5-B

Questions?

Talk to your supervisor or the designated Competent Person if you have any questions about silica hazards or controls on your jobsite.

Competent Person: _____

Phone: _____

Remember: Protecting yourself from silica protects your health for life!