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INTERNATIONAL SURFACE FABRICATORS ASSOCIATION
Giving Fabricators an Edge

Air Purifying Respirator Selection Criteria for Respirable Crystalline Silica in General Industry

Assembled by the Yale Occupational & Environmental Medicine Program

This document is a product of a collaborative alliance between the Natural Stone Institute and the International Surface Fabricators Association, developed in partnership with the Yale Occupational & Environmental Medicine Program.

These organizations are working to support regulatory compliance and advance worker health and safety. Our goal is to provide all countertop, surface and natural stone fabrication shops—regardless of size or location— with clear, practical guidance to understand and meet regulatory responsibilities and mimimize workplace hazards.

Respirable Crystalline Silica exposures should be reduced using the hierarchy of controls, a long-standing framework that prioritizes hazard control methods. The use of engineering and work practice controls to reduce exposures as low as possible is preferable to the use of respirators, which can provide workers additional protection.

The use of respirators requires compliance with an **OSHA-mandated Respiratory Protection Program**, including a written program with documentation of RCS exposures, proper respirator selection, fit testing, training and medical evaluation.

Respirators are the least effective measure to control exposures for several reasons:

- The proper respirator must be selected for each worker, fit tested, and regularly maintained (including replacing filters and other parts as necessary).
- Employees have to correctly use their fitted respirators and may resist wearing them as they can be uncomfortable, especially in hot weather.
- Respirators may put a physical strain on employees' bodies, as they can increase the work of breathing.
- Respirators can create safety concerns because they interfere with workers' ability to hear, see, smell, and communicate.
- Respirators only protect the employees wearing them, and not co-workers and bystanders.

Air Purifying Respirator Selection Criteria for Respirable Crystalline Silica in General Industry[1]

All U.S. States
(Except High Exposure Trigger Tasks in California)

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Respirable Crystalline Silica Exposure Levels (micrograms per m^3)	Acceptable Types of Respirators
< 25 µg/m3	• None required • "Voluntary use" rules apply if worn *Note: Additional monitoring is not required when two consecutive results within 6 months are below action level as long as no changes in the workplace occur.*
≥ 25 µg/m3 to ≤ 50 µg/m3	• None required • "Voluntary use" rules apply if worn *Note: Employer must repeat monitoring within six months. Medical Surveillance is required for employees at this level for 30 or more days per year.*
> 50 to ≤ 500 µg/m3	• Half-face elastomeric air purifying respirator with N-, R-, or P-95, 99, or 100 (HEPA) cartridges, or • Disposable half-face filtering facepiece respirator N-, R-, or P-95, 99, or 100 (HEPA) *Note: Employer must repeat monitoring within three months, Medical Surveillance is required, and employer shall describe corrective action being taken to reduce exposure to below PEL.*
> 500 to ≤ 1,250 µg/m3	• Powered air purifying respirator with HEPA cartridge(s) and a loose-fitting facepiece such as a hood, shroud, or helmet *Note: Exposure levels into the hundreds of µg/m3 are unlikely except from dry work, and should prompt urgent review of operations and changes in engineering controls and work practices.*

"High-exposure trigger tasks" is defined as any dust-generating work with artificial stone that contains more than 0.1% crystalline silica by weight or with natural stone that contains more than 10% crystalline silica by weight.

A useful introduction to the types of air purifying respirators is available from NIOSH at: **https://www.cdc.gov/niosh/docs/2018-176/pdfs/2018-176.pdf**

All respirators and filters/cartridges must be NIOSH certified and so labeled. A searchable link to the NIOSH *Certified Equipment List* can be found at: **https://wwwn.cdc.gov/niosh-cel/**.

Companies requiring employees to use respirators must develop a written respiratory protection program and provide users with initial and annual refresher training, medical clearance, fit testing, and maintain the respirators, all free-of-charge to employees.

The types of air purifying respirators described above are strictly for protection against airborne silica in an environment with normal oxygen levels. Exposures involving chemical gases or vapors may require additional or alternative respirators, as does any work in an oxygen-deficient atmosphere.

[1] Based upon OSHA and Cal OSHA standards for respirable crystalline silica in general industry (29 CFR Part 1910.1053 and CCR Title 8 Section 5204, respectively) and respiratory protection (29 CFR Part 1910.134 and CCR Title 8 Section 5144, respectively).

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California Only – High Exposure Trigger Tasks (Respirators Required Regardless of Exposure Levels)

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Respirable Crystalline Silica Exposure Levels (micrograms per m^3)	Acceptable Types of Respirators
< 25 µg/m3 (reverified at least semi-annually)	• Half-face elastomeric air purifying respirator with N100, R100, or P100 (HEPA) cartridge(s) or • Disposable half-face filtering facepiece respirator N100, R100, or P100 (HEPA) *But only permitted if:* • All employees participate in medical surveillance • No current or previous employees diagnosed with silicosis • No current employee diagnosed with suspected silicosis
< 25 µg/m3 (reverified at least semi-annually)	• Powered air purifying respirator with HEPA cartridge(s) and a loose- or tight-fitting facepiece, or • Full-face elastomeric air purifying respirator with N100, R100, or P100 (HEPA) cartridges

≥ 25 µg/m3	• Powered air purifying respirator with HEPA cartridge(s) and a:
	  • Tight-fitting full facepiece, or
	  • Helmet or hood with manufacturer data demonstrating an assigned protection factor (APF) of 1,000 or greater

Regardless of Exposure Levels	• Positive pressure supplied air respirators required for any employees diagnosed with silicosis, suspected silicosis, or recommended by physician or other licensed healthcare professional

"High-exposure trigger tasks" is defined as any dust-generating work with artificial stone that contains more than 0.1% crystalline silica by weight or with natural stone that contains more than 10% crystalline silica by weight. **When conducting these tasks, exposure monitoring, regulated areas, respirator usage, hazard control plans, and stringent housekeeping are required.**

A useful introduction to the types of air purifying respirators is available from NIOSH at: **https://www.cdc.gov/niosh/docs/2018-176/pdfs/2018-176.pdf**

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All companies requiring employees to use respirators must first develop a written respiratory protection program and provide users with initial and annual refresher training, medical clearance, fit testing, and their respirators, all free-of-charge to employees.

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