



Breathe Safer

REFERENCE GUIDE

This reference guide deals only with the standards for respirable silica for the construction industry.



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What is Respirable Crystalline Silica?

Crystalline silica, is a common mineral found in many naturally occurring and man-made materials used at construction sites. Materials like sand, concrete, brick, block, stone and mortar contain crystalline silica.*

Respirable crystalline silica are very small particles typically at least 100 times smaller than ordinary sand found on beaches or playgrounds. Crystalline silica is generated by high-energy operations like cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick, block and mortar, or when abrasive blasting with sand. Inhaling crystalline silica particles has been shown to create an increased risk of developing serious illnesses or diseases such as lung cancer, silicosis, and chronic obstructive pulmonary disorder.** Each exposure to silica adds to the lung damage.

Out The Risk

What is Silicosis?

Silicosis is a disabling, and sometimes fatal lung disease. When a worker inhales crystalline silica, the lungs react by developing hard nodules and scarring around the trapped silica particles. If the nodules become too large, breathing becomes difficult and death can result. There is no cure for this disease.

* Amorphous silica, such as silica gel, is not crystalline silica.

** For more information please refer to 29 CFR 1926.1153, Appendix B (Medical Surveillance Guidelines) and the Occupational Exposure to Respirable Crystalline Silica Final Rule, 81 Fed. Reg. 16286 (Mar. 25, 2016)



Safety is all we do.

Safety Works® was first founded in 1998.

Since then we've built longstanding and trusted relationships with leading retailers and wholesalers in the retail-focused DIY and contractor market.

Our success has been in providing customers with safety products that are priced-right, performance tested and packaged to enhance the shopping experience and sales.

Today, we are part of Protective Industrial Products, Inc., a U.S.-based leader in General Safety products with more than 15 locations across the world and globally integrated logistics and sourcing operations based in the U.S.A. and Hong Kong.

With over 80 people in Asia overseeing partner factories, we're able to deliver quality, value and compliance in safety products that is above any of our competitors.

Our focus is exclusively on personal safety.

It's all we do, so we're best positioned to assist retail professionals in selecting the best safety products for specific market needs.



ROADMAP FOR MEETING THE REQUIREMENTS OF THE RESPIRABLE CRYSTALLINE SILICA IN CONSTRUCTION REGULATION 29 CFR 1926.1153

1. Determine if the silica standard applies to your employees.

Could employees be exposed to respirable crystalline silica at or above 25 µg/m³ as an 8-hour TWA* under any foreseeable conditions, including the failure of engineering controls, while performing construction activities?

No: No further action is required under the silica standard.

Yes: Choose to comply with the standard using either the:

- Specified exposure control methods in Table 1 (page 6-7), or
- The alternative methods of compliance

2. Determine what additional requirements you must meet under the standard, based on the compliance method you are following.

REQUIREMENT	MUST THE EMPLOYER FOLLOW THIS REQUIREMENT?	
	IF FULLY AND PROPERLY IMPLEMENTING TABLE 1 (page 6)	IF FOLLOWING ALTERNATIVE EXPOSURE CONTROLS
Permissible Exposure Limit (PEL)	No	Yes
Exposure Assessment	No	Yes
Methods of Compliance	No	Yes
Respiratory Protection	Yes, if respirator use is required by Table 1	Yes
Housekeeping	Yes	Yes
Written Exposure Control Plan	Yes	Yes
Medical surveillance	Yes, for employees who must wear a respirator under the silica standard for 30 or more days a year.	
Communication of Hazards	Yes	Yes
Recordkeeping	Yes, for any employees who are getting medical examinations	Yes

Source: OSHA Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction OSHA 3902-07R 2017

* Time Weighted Average

SPECIFIED EXPOSURE CONTROL METHODS – PARAGRAPH (C) OF THE STANDARD

The silica standard for construction provides a flexible approach for construction employers to achieve compliance. The standard includes Table 1 (page 6-7), which lists 18 common tasks using various types of tools or equipment found at construction sites. For each employee engaged in a task in Table 1, employers who choose to follow the Table for that task are required to fully and properly implement the engineering controls, work practices, and respiratory protection specified in Table 1. Employers who comply with the controls of Table 1 are not required to conduct exposure assessments or comply with a Permissible Exposure Limit (PEL) for those employees.

Employees engaged in the Table 1 task means the equipment operator; helpers, laborers and other employees who are assisting with the task; or any other employee responsible for completing the task. For example, an employee operating a walk-behind saw and another employee helping the operator guide the saw are both engaged in the task. An employee operating a jackhammer would be engaged in the task, but another employee directing traffic near the employee jackhammering would not be engaged in the task. **When Table 1 requires respiratory protection, employers must provide respirators to all employees engaged in the task.** Employers must describe procedures for restricting access of employees not engaged in the task as part of its Written Exposure Control Plan.

Several entries in Table 1 have requirements for the use of respiratory protection with a minimum “assigned protection factor” (APF). Paragraph (d)(3)(i)(A) of the Respiratory Protection standard (29 CFR 1910.134) includes a table that can be used to determine the type or class of respirator that will provide employees with a particular APF, and it can help employers determine the type of respirator that would meet the required minimum APF specified by Table 1. Employers have the flexibility to provide a more protective respirator to those employees who request one or require the employees to use a more protective respirator. See section on Determining Task Duration and Requirements for Respirator Use for information on how to measure task duration to determine respiratory protection requirements for employees doing one or more Table 1 task.

DETERMINING TASK DURATION AND REQUIREMENTS FOR RESPIRATOR USE

Respirator requirements in Table 1 (page 6-7) are divided by task duration:

- "Less than or equal to four hours/shift" and,
- "Greater than four hours/shift".

Each of the following scenarios is considered a "shift" for purposes of determining the maximum amount of time that an employee may spend on Table 1 tasks without respiratory protection:

- A standard 8-hour work period;
- A day with a break between work periods (e.g., four hours on, two hours off, four hours on);
- Work periods longer than eight hours;
- Double shifts within a single day;
- A work period spanning two calendar days (e.g., 8 p.m. until 4 a.m.).

Task duration time starts when the operator begins using the tool, and continues to be counted until he or she completes the task. This time includes intermittent breaks in tool usage and clean-up. However, tasks that are performed multiple times per day, during distinct time periods, should be counted as separate tasks, and times should be combined.

The requirement to provide respirators is based on the anticipated duration of the task. Employers must make a good-faith judgment

EXAMPLES OF DETERMINING TASK DURATIONS

1. Tasks with intermittent breaks. An employee cuts and places bricks, one at a time, for four hours consecutively and then spends 30 minutes cleaning up the saw and emptying slurry or dust collectors. All four hours spent cutting and laying bricks along with the 30 minutes for clean-up count for a total task duration of four and a half hours.
2. Tasks with distinct time periods. An employee cuts multiple bricks for 15 minutes, lays bricks for two hours before returning to cut more bricks for another 30 minutes. The total task duration is 45 minutes of the task's anticipated duration over the work shift, whether performed continuously or intermittently, based on previous experience and all other available information.

EXAMPLES OF RESPIRATORY PROTECTION REQUIREMENTS FOR SINGLE TASKS IN TABLE 1 (page 6)

1. An employer anticipates that it will take an employee 3 hours to cut concrete walls using a handheld power saw (outdoors). No respiratory protection is required.
2. An employer anticipates that it will take an employee 5 hours to demolish an asphalt road using a jackhammer (outdoors). The employer must provide a respirator with an APF of 10 and ensure that the employee wears it for the entire duration of the task.
3. An employer anticipates that it will take an employee 3 hours to grind a concrete floor (indoors) and, therefore, determines that respiratory protection is not required under Table 1. However, at two hours, the employer determines that it will take more than 4 hours to complete the task. The employer must provide a respirator with an APF of 10 at that time and ensure that the employee wears it for the remaining duration of the task.

EXAMPLES OF RESPIRATORY PROTECTION REQUIREMENTS FOR EMPLOYEES WHO DO MORE THAN ONE TABLE 1 TASK

1. An employer anticipates that an employee will use a handheld grinder on a concrete wall outdoors for 3 hours and then use a chipping hammer outdoors for 2 hours (total Table 1 task duration of 5 hours per shift). The employer looks in the "> 4 hour/shift" column for each task to determine that no respiratory protection is required during use of the handheld grinder outdoors, but a respirator with an APF of 10 is required during use of the chipping hammer outdoors.
2. An employer anticipates that an employee will use a stationary masonry saw to cut bricks for 1 hour and use a handheld power saw to cut concrete indoors for 1 hour over the course of a shift (total Table 1 task duration of two hours per shift). The employer looks in the "≤ 4 hour/shift" column for each task to determine that no respiratory protection is required during use of the stationary masonry saw, but a respirator with an APF of 10 is required during use of the handheld power saw indoors.
3. An employer anticipates that an employee will drive a half-lane milling machine for 4 hours and then operate a walk-behind milling machine equipped with an integrated water delivery system for 4 hours (total Table 1 task duration of 8 hours). The employer looks in the "> 4 hour/shift" column for each task to determine that no respiratory protection is required for either task.





Cartridges & Filters

PRODUCT NUMBER	CATEGORY	NIOSH Particulate Rating	NIOSH Particulate Rating	Ammonia	Chlorine	Chlorine Dioxide	Formaldehyde	Hydrogen Chloride	Hydrogen Fluoride	Hydrogen Sulfide	Methylamine	Organic Vapors	Sulfur Dioxide	EACH/PACK	PACKAGED
		P100	P95	AM	CL	CD	FM	HC	HF	H5	MA	OV	SD		
SWX00324	Replacement Cartridges	•												1 Pair	Retail
SWX00325	Replacement Cartridges	•			•			•				•	•	1 Pair	Retail
SWX00326	Replacement Cartridges	•	•	•	•	•	•	•	•	•	•	•	•	1 Pair	Retail
SWX00389	Replacement Cartridges											•		1 Pair	Industrial
SWX00390	Replacement Cartridges	•			•			•				•	•	1 Pair	Industrial
SWX00391	Replacement Cartridges	•		•	•	•	•	•	•	•	•	•	•	1 Pair	Industrial
SWX00322	Replacement Cartridge & Pre-Filter		•									•		1 Pair	Retail
SWX00392	Replacement Filter	•												1 Pair	Industrial
SWX00323	Pre-Filter		•											6 Pair	Industrial
SWX00394	Pre-Filter Cap													10	Industrial
SWX00395	Replacement Pancake	•												1 Pair	Industrial
SWX00396	Replacement Pancake	•										•		1 Pair	Industrial

Fit Testing & Trainer Kit

PRODUCT NUMBER	CATEGORY	EACH/PACK	PACKAGED
SWX00405	Trainer Kit	1 Kit	Industrial
SWX00406	Bitrex™ Fit Test Kit* QLT	1 Kit	Industrial



Disposable



- Designed for easy breathing
- Adjustable nose-clip improves fit and seal
- Dual point elastics for extra secure fit
- Moldable metal noseband helps reduce fogging of glasses

PRODUCT NUMBER	NIOSH 42 CFR 84			FEATURE										APF	EACH/PACK	PACKAGED
	N95	N100	P100	Odor Filter	Exhalation Valve	Moldable Metal Noseband	Nose Pad	Full Pad	Adjustable Straps							
817633	●					●	●							10	2	Retail
10102481	●					●	●							10	20	Retail
10103821	●				●	●	●							10	1	Retail
10102483	●				●	●	●							10	10	Retail
10102485	●			●		●	●							10	1	Retail
SWX00397		●				●	●							10	3	Retail
SWX00398		●				●	●							10	10	Retail
SWX00399			●		●	●	●		●	●		●	●	10	1	Retail
SWX00404			●		●	●	●		●	●		●	●	10	5	Retail

Half-Mask

- Soft facepiece for enhanced comfort
- Unique hygiene guard keeps mask clean during storage
- Easy-to-adjust, comfortable head strap
- Complete kit includes cartridges



Full Facepiece

- Higher Applied Protection Factor
- Covers eye and face
- Helps protect against liquid splashes and irritating vapors
- Wrap around lens for excellent field of vision
- Integral nose cup for reducing fogging



PRODUCT NUMBER	CATEGORY	SIZE	NIOSH 42 CFR 84													APF*	EACH/PACK	PACKAGED		
			P100	P95	AM	CL	CD	FM	HC	HF	HS	MA	OV	SD						
SWX00319	Half-Mask w/Cartridge	M	●															10	1	Retail
SWX00321	Half-Mask w/Cartridge	M	●		●	●	●	●	●	●	●	●	●	●	●	●	●	10	1	Retail
SWX00320	Half-Mask w/Cartridge	M	●			●				●					●	●		10	1	Retail
SWX00318	Half-Mask w/Cartridge	M		●											●			10	1	Retail
SWX00386	Half-Mask Only	M																10	1	Industrial
SWX00387	Half-Mask Only	L																10	1	Industrial
SWX00328	Full Facepiece w/Cartridge	M/L	●		●	●	●	●	●	●	●	●	●	●	●	●	●	**10/50	1	Retail
SWX00327	Full Facepiece w/Cartridge	M/L		●											●			**10/50	1	Retail
SWX00388	Full Facepiece Only	M/L																**10/50	1	Industrial

* The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by section 29 CFR 1910.134, including training, fit testing, maintenance and use requirements.

** 10 - APF 10 with Qualitative Fit Testing / 50 - APF 50 with Quantitative Fit Testing

TABLE 1: Specified Exposure Control Methods When

REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)

EQUIPMENT/TASK	ENGINEERING AND WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)	
		≤ 4 HOURS/SHIFT	> 4 HOURS/SHIFT
(i) Stationary masonry saws	<ul style="list-style-type: none"> - Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 	None	None
(ii) Handheld power saws (any blade diameter)	<ul style="list-style-type: none"> - Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <ul style="list-style-type: none"> - When used outdoors. - When used indoors or in an enclosed area. 	None APF 10	APF 10 APF 10
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)	<p><i>For tasks performed outdoors only:</i></p> <ul style="list-style-type: none"> - Use saw equipped with commercially available dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency. 	None	None
(iv) Walk-behind saws	<ul style="list-style-type: none"> - Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <ul style="list-style-type: none"> - When used outdoors. - When used indoors or in an enclosed area. 	None APF 10	None APF 10
(v) Drivable saws	<p><i>For tasks performed outdoors only:</i></p> <ul style="list-style-type: none"> - Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 	None	None
(vi) Rig-mounted core saws or drills	<ul style="list-style-type: none"> - Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. 	None	None

REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)

EQUIPMENT/TASK	ENGINEERING AND WORK PRACTICE CONTROL METHODS	REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)	
		≤ 4 HOURS/SHIFT	> 4 HOURS/SHIFT
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	<ul style="list-style-type: none"> - Use drill equipped with commercially available shroud or cowling with dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes. 	None	None
(viii) Dowel drilling rigs for concrete	<p><i>For tasks performed outdoors only:</i></p> <ul style="list-style-type: none"> - Use shroud around drill bit with a dust collection system. - Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes. 	APF 10	APF 10
(ix) Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> - Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector. OR - Operate from within an enclosed cab and use water for dust suppression on drill bit. 	None	None
(x) Jackhammers and handheld powered chipping tools	<ul style="list-style-type: none"> - Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact. <ul style="list-style-type: none"> - When used outdoors. - When used indoors or in an enclosed area. OR - Use tool equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. <ul style="list-style-type: none"> - When used outdoors. - When used indoors or in an enclosed area. 	None APF 10	APF 10 APF 10

**IF YOUR TASK IS NOT LISTED IN TABLE 1 PLEASE REFER TO:
RESPIRABLE CRYSTALLINE SILICA IN CONSTRUCTION REGULATION 29 CFR 1926.1153 FOR GUIDANCE**

Working with Materials Containing Crystalline Silica

REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)

EQUIPMENT/TASK	ENGINEERING AND WORK PRACTICE CONTROL METHODS	≤ 4 HOURS/SHIFT	> 4 HOURS/SHIFT
(xi) Handheld grinders for mortar removal (i.e., tuckpointing)	<ul style="list-style-type: none"> - Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism. 	APF 10	APF 25
(xii) Handheld grinders for uses other than mortar removal	<p><i>For tasks performed outdoors only:</i></p> <ul style="list-style-type: none"> - Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <p>OR</p> <ul style="list-style-type: none"> - Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism. - When used outdoors. - When used indoors or in an enclosed area. 	None	None
(xiii) Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> - Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. <p>OR</p> <ul style="list-style-type: none"> - Use machine equipped with dust collection system recommended by the manufacturer. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes. 	None	None

REQUIRED RESPIRATORY PROTECTION AND MINIMUM ASSIGNED PROTECTION FACTOR (APF)

EQUIPMENT/TASK	ENGINEERING AND WORK PRACTICE CONTROL METHODS	≤ 4 HOURS/SHIFT	> 4 HOURS/SHIFT
(xiv) Small drivable milling machines (less than half-lane)	<ul style="list-style-type: none"> - Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant. - Operate and maintain machine to minimize dust emissions. 	None	None
(xv) Large drivable milling machines (half-lane and larger)	<p><i>For cuts of any depth on asphalt only:</i></p> <ul style="list-style-type: none"> - Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. - Operate and maintain machine to minimize dust emissions. <p><i>For cuts of four inches in depth or less on any substrate:</i></p> <ul style="list-style-type: none"> - Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. - Operate and maintain machine to minimize dust emissions. <p>OR</p> <ul style="list-style-type: none"> - Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant. - Operate and maintain machine to minimize dust emissions. 	None	None
(xvi) Crushing machines	<ul style="list-style-type: none"> - Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). - Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions. - Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station. 	None	None
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	<ul style="list-style-type: none"> - Operate equipment from within an enclosed cab. - When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions. 	None	None
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials	<ul style="list-style-type: none"> - Apply water and/or dust suppressants as necessary to minimize dust emissions. <p>OR</p> <ul style="list-style-type: none"> - When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab. 	None	None



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IMPORTANT: Respirator and cartridge type must be chosen based on the contaminant plus airborne concentration and the necessary Assigned Protection Factor (APF). Refer to WARNING below.
WARNING: These respirators help protect against certain airborne contaminants. Misuse may result in sickness or death. For proper use, the wearer must read and understand User Instructions provided as a part of product packaging, see your supervisor. Time use limitations may apply.

Important — Before using these respirators, you must determine the following:

1. The type of contaminant(s) for which the respirator is being selected.
2. The concentration level of contaminant(s).
3. Whether the respirator can be properly fitted on the wearer's face. All respirator instructions, warnings and use and time limitations must also be read and understood by the wearer before use. Before use of these respirators, a written respiratory protection program must be implemented, meeting all the requirements of OSHA 29 CFR 1910.134, including training and fit testing.

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