

## **OSHA Standards for Silica**

Effective June 23, 2016

### **Content Package Contents**

To help better understand the new OSHA Standards for Silica, download the helpful documents in this content package. The two new standards – General Industry 29 CFR 1910.1953 & Construction Industry 29 CFR 1926.1153 – became active on June 23, 2016.

### **Content Package Contents**

Click links below to access the following materials:

- OSHA Silica Standard Regulatory Information
- Honeywell Respirator Selection for Silica in the Construction Industry
- Honeywell Respirator Selection for Silica in the General Industry
- Frequently Asked Questions



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## REGULATORY INFORMATION

### OSHA Standards for Protection from Silica Exposure

#### Overview of OSHA 29 CFR1910.1053 & 29 CFR1926.1153

The Occupational Safety and Health Administration (OSHA) has promulgated the Final Rule for occupational exposures to respirable crystalline silica. There are two separate Standards, the first covers General Industry and Maritime, and the second covers Construction. While there are similarities between the two, there are some significant differences with some of the requirements. This is a brief overview of these two Standards to be used as a guide. This overview does not replace a thorough understanding of all requirements, including the Respiratory Protection Standard 29 CFR 1910.134. Copies of the complete Standards and Amendments can be found on the Honeywell web site [honeywellsafety.com](http://honeywellsafety.com). Agricultural operations are covered by 29 CFR Part 1928.



Key definitions are included at the end of this document.

STANDARD REQUIREMENTS	GENERAL INDUSTRY AND MARITIME	CONSTRUCTION
<b>STANDARD</b>	29 CFR 1910.1053	29 CFR 1926.1153
<b>KEY DATES</b>		
Effective	June 23, 2016	June 23, 2016
Full Compliance, except for 1) Medical Surveillance, and 2) Engineering Controls for Hydraulic Fracturing	June 23, 2018	June 23, 2017
Sample Analysis	June 23, 2018	June 23, 2018
Medical Surveillance for employees exposed $\geq$ the PEL for 30 or more days per year	June 23, 2018	June 23, 2017
Medical Surveillance for employees exposed $\geq$ the Action Level for 30 or more days per year	June 23, 2020	June 23, 2017
Engineering Controls for Hydraulic Fracturing	June 23, 2021	Not Applicable
<b>EXPOSURE LEVELS</b>		
Action Level	25 $\mu\text{g}/\text{m}^3$	25 $\mu\text{g}/\text{m}^3$
PEL	50 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
<b>MONITORING AND AIR SAMPLING</b>		
Initial monitoring to assess the exposure of each Employee who may be exposed to respirable crystalline silica. If initial monitoring determines exposure is:	<ul style="list-style-type: none"> <li>Performance Option: Use air monitoring data or objective data</li> <li>Scheduled Monitoring Option: use personal breathing zone air samples that reflect the exposure of each shift and job classification</li> </ul>	
< the Action Level (25 $\mu\text{g}/\text{m}^3$ )	<ul style="list-style-type: none"> <li>Discontinue monitoring</li> </ul>	
$\geq$ the Action Level (25 $\mu\text{g}/\text{m}^3$ ), and < the PEL (50 $\mu\text{g}/\text{m}^3$ )	<ul style="list-style-type: none"> <li>Repeat monitoring within 6 months of last monitoring</li> </ul>	
$\geq$ the PEL (50 $\mu\text{g}/\text{m}^3$ )	<ul style="list-style-type: none"> <li>Repeat monitoring within 3 months of last monitoring</li> </ul>	

## REGULATORY INFORMATION

# OSHA Standards for Protection from Silica Exposure

Overview of OSHA 29 CFR1910.1053 & 29 CFR1926.1153

STANDARD REQUIREMENTS	GENERAL INDUSTRY AND MARITIME	CONSTRUCTION
<b>ENGINEERING CONTROLS</b>		
<p>Whenever feasible, use Engineering and work practice controls to reduce and maintain employee exposure to respirable crystalline silica</p>		<p>Table 1 of the Construction Standard outlines specific Engineering Controls that can eliminate or minimize exposure so respiratory protection may not be needed</p> <p>Refer to “Silica Standard” at <a href="http://honeywellsafety.com">honeywellsafety.com</a> for the complete Table.</p> <p>The following tasks may require respirators providing an APF of 10 depending on type of Engineering Controls and whether used indoors or outside</p> <ul style="list-style-type: none"> <li>• Handheld power saws</li> <li>• Walk behind saws used indoors or enclosed space</li> <li>• Dowel drilling rigs for concrete</li> <li>• Jackhammers and handheld power chipping tools</li> <li>• Handheld grinders for mortar removal</li> <li>• Walk behind milling machines and floor grinders</li> </ul>
<b>WRITTEN EXPOSURE CONTROL PLAN</b>		
<p>The Written Exposure Control Plan must contain the descriptions of each of the elements listed on the right</p>	<ul style="list-style-type: none"> <li>• The tasks in the workplace that involve exposure to respirable crystalline silica</li> <li>• Engineering Controls, work practices and respiratory protection used to limit employee exposure</li> <li>• Housekeeping measures</li> <li>• Procedures used to restrict access to work areas to minimize the number of employees exposed</li> </ul>	
<p>Written Exposure Control Plan must be reviewed and updated</p>	<ul style="list-style-type: none"> <li>• Annually at a minimum</li> </ul>	
<p>Managed by a competent person who must perform the tasks listed on the right</p>	<ul style="list-style-type: none"> <li>• Implement the Plan</li> <li>• Make frequent and regular inspections of the work site, materials and equipment</li> </ul>	

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STANDARD REQUIREMENTS	GENERAL INDUSTRY AND MARITIME	CONSTRUCTION
<b>HOUSEKEEPING</b>		
Proper implementation of housekeeping practices will reduce Employees' exposure to respirable crystalline silica. It must include procedures listed on the right	<ul style="list-style-type: none"> <li>Do not allow dry sweeping or dry brushing where it could contribute to exposure unless wet sweeping with high efficiency particulate air-purifying (HEPA) filtered vacuuming or other methods are not feasible.</li> <li>Do not allow compressed air to be used to clean surfaces where it could contribute to exposure unless compressed air is used in conjunction with a ventilation system or no alternative is feasible</li> </ul>	
<b>MEDICAL SURVEILLANCE REQUIREMENTS</b>		
Who is required to have Medical Surveillance?	All employees where exposure is at or above the Action Level (25 µg/m <sup>3</sup> ) for 30 or more days per year	All employees required to wear a respirator for 30 or more days per year
<b>Frequency</b>		
Baseline Medical Examination	Within 30 Days after initial assignment Exemption: Any employee who has received a Medical Examination within the last 3 years which meet all requirements below	
Periodic Examinations	At least every 3 years, or more frequently if recommended by the PLHCP	
<b>Medical Evaluation and History - Required</b>		
Medical Evaluation: PLHCP obligation	Review each employee's medical and work history, with a focus on past and present exposure to respirable silica, and any history or signs of respiratory disease <ul style="list-style-type: none"> <li>Shortness of breath</li> <li>Coughing or wheezing</li> <li>Tuberculosis</li> <li>Smoking status and history</li> </ul>	
Medical Evaluation: Employer's obligation	Provide the PLHCP with <ul style="list-style-type: none"> <li>Description of employee's past, present and anticipated duties that involve exposure to silica</li> <li>The employee's past, present and anticipated levels of occupational exposure to silica</li> <li>Description of personal protective equipment used including when and for how long</li> <li>Information from records of employment related Medical Exams that are within the control of the Employer</li> </ul>	

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Overview of OSHA 29 CFR1910.1053 & 29 CFR1926.1153

STANDARD REQUIREMENTS	GENERAL INDUSTRY AND MARITIME	CONSTRUCTION
<b>MEDICAL SURVEILLANCE REQUIREMENTS, Cont.</b>		
<p><b>Physical Examination – Required</b> The Standard has specific instructions that must be followed by the PLHCP when conducting the Chest X-Ray and PFT</p>	<p>Each Employee must have a Physical Exam that includes:</p> <ul style="list-style-type: none"> <li>• Chest X-Ray</li> <li>• Pulmonary Function Test (PFT)</li> <li>• Test for Tuberculosis</li> </ul> <p>The Employer <u>must</u> provide each Employee with a copy of the written Medical Opinion of the PLHCP within 30 days of the Medical Exam</p>	
<b>HAZARD COMMUNICATION</b>		
<p>Must comply with the Hazard Communication Standard 29 CFR 1910.1200. The General Industry and Maritime Standard must also include signage information noted on the right</p>	<p>Post signs at all regulated areas. Signs must include:</p> <ul style="list-style-type: none"> <li>• DANGER</li> <li>• RESPIRABLE CRYSTALLINE SILICA</li> <li>• MAY CAUSE CANCER</li> <li>• WEAR RESPIRATORY PROTECTION IN THIS AREA</li> <li>• AUTHORIZED PERSONNEL ONLY</li> </ul>	
<b>TRAINING</b>		
<p>In addition to training required as part of a Respiratory Protection Program, employees must demonstrate a knowledge and understanding of items listed on the right</p>	<ul style="list-style-type: none"> <li>• Health hazards associated with exposure to respirable silica</li> <li>• Specific tasks at that worksite that could result in silica exposure</li> <li>• What measures the Employer has implemented to control silica exposure</li> <li>• The purpose and description of the Medical Surveillance program</li> </ul>	<ul style="list-style-type: none"> <li>• Everything required for General Industry &amp; Maritime Standard listed on the left, plus;</li> <li>• The identity of the competent person designated by the employer to implement the written Exposure Control Plan, including job site inspections.</li> </ul>

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## REGULATORY INFORMATION

# OSHA Standards for Protection from Silica Exposure

Overview of OSHA 29 CFR1910.1053 & 29 CFR1926.1153

STANDARD REQUIREMENTS	GENERAL INDUSTRY AND MARITIME	CONSTRUCTION
<b>RESPIRATORY PROTECTION</b>		
When Engineering and Administrative controls are insufficient in reducing employees' exposure to respirable crystalline silica, respiratory protection is required. The General Industry and Maritime Standard, 29 CFR 1910.1053 and Construction Standard 29 CFR 1926.1153 require a Respiratory Protection Program per OSHA Standard 29 CFR 1910.134.	Refer to Honeywell Guide to Respiratory Protection for Silica or visit the Honeywell web site at Honeywellsafety.com	

### KEY DEFINITIONS

Action Level	The level which triggers requirements for exposure monitoring and medical surveillance.
Employee Exposure	The exposure to airborne respirable crystalline silica that would occur if the employee were not using a respirator.
<i>High-efficiency particulate air [HEPA] filter</i>	A filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter.
Objective Data	Information, such as air monitoring data from industry-wide surveys or calculations based on the composition of a substance, demonstrating employee exposure to respirable crystalline silica associated with a particular product or material, or a specific process, task or activity.
PEL	Permissible Exposure Level. The maximum allowable concentration of a contaminant in the air to which an individual may be exposed for a time weighted average for an <u>8 hour day, 40 hour work week</u> . Set by <u>OSHA</u> .
<i>Physician or Other Licensed Health Care Professional [PLHCP]</i>	An individual whose legally permitted scope of practice ( <i>i.e.</i> , license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the particular health care services.
<i>Regulated Area</i>	An area, demarcated by the employer, where an employee's exposure to airborne concentrations of respirable crystalline silica exceeds, or can reasonably be expected to exceed, the PEL.
<i>Respirable Crystalline Silica</i>	Quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers specified in the International Organization for Standardization (ISO).
µg/m <sup>3</sup>	Micrograms per Cubic Meter

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## TECHNICAL DATA

### Guide to Respiratory Protection from Silica

OSHA 29 CFR1926.1153 for Construction Industry

When Engineering and Administrative controls are insufficient in reducing employees' exposure to respirable crystalline silica, respiratory protection is required. The Construction Standard for Silica includes a table with appropriate engineering controls for several tasks, plus the appropriate respiratory protection when it is considered that engineering controls would not be sufficient. A Respiratory Protection Program per the Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.134 must also be followed.

The respiratory recommendations listed below are for exposure to respirable crystalline silica only. If there are other contaminants present additional respiratory protection may be required. If there are oil-based aerosols present an R or P type filter must be used.



The following is Table 1 from the Silica Construction Standard, listing the required engineering and work practice control methods, and the OSHA Assigned protection factor (APF) based on the expected exposure for those tasks when engineering controls are in place. Recommendations of product that have these APF is in the chart below this one.

**OSHA 29 CFR1926.1153 TABLE 1**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(i) Stationary masonry saws	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
(ii) Handheld power saws (any blade diameter)	<ul style="list-style-type: none"> <li>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.                             <ul style="list-style-type: none"> <li>– When used outdoors.</li> <li>– When used indoors or in an enclosed area.</li> </ul> </li> </ul>	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>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> <li>Use saw equipped with commercially available dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.</li> </ul>	None	None

## TECHNICAL DATA

**OSHA 29 CFR1926.1153 TABLE 1, cont.**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(iv) Walk Behind Saws	<ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.                             <ul style="list-style-type: none"> <li>- When used outdoors.</li> <li>- When used indoors or in an enclosed area.</li> </ul> </li> </ul>	None APF 10	None APF 10
(v) Drivable saws	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> <li>• Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
(vi) Rig-mounted core saws or drills	<ul style="list-style-type: none"> <li>• Use tool equipped with integrated water delivery system that supplies water to cutting surface.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul>	None	None
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	<ul style="list-style-type: none"> <li>• Use drill equipped with commercially available shroud or cowling with dust collection system.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• 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.</li> <li>• Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>	None	None
(viii) Dowel drilling rigs for concrete	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Use a HEPA-filtered vacuum when cleaning holes.</li> </ul>	APF 10	APF 10

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## TECHNICAL DATA

**OSHA 29 CFR1926.1153 TABLE 1, cont.**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(ix) Vehicle-mounted drilling rigs for rock and concrete	<ul style="list-style-type: none"> <li>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.</li> </ul>	None	None
	<p>OR</p> <ul style="list-style-type: none"> <li>Operate from within an enclosed cab and use water for dust suppression on drill bit.</li> </ul>	None	None
(x) Jackhammers and handheld powered chipping tools	<ul style="list-style-type: none"> <li>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"> <li>When used outdoors.</li> <li>When used indoors or in an enclosed area.</li> </ul> </li> </ul>	None APF 10	APF 10 APF 10
	<p>OR</p> <ul style="list-style-type: none"> <li>Use tool equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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"> <li>When used outdoors.</li> <li>When used indoors or in an enclosed area.</li> </ul> </li> </ul>	None APF 10	APR 10 APF 10
(xi) Handheld grinders for mortar removal (i.e., tuckpointing)	<ul style="list-style-type: none"> <li>Use grinder equipped with commercially available shroud and dust collection system.</li> <li>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>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.</li> </ul>	APF 10	APF 25

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## TECHNICAL DATA

**OSHA 29 CFR1926.1153 TABLE 1, cont.**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(xii) Handheld grinders for uses other than mortar removal	<p>For tasks performed outdoors only:</p> <ul style="list-style-type: none"> <li>• Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Use grinder equipped with commercially available shroud and dust collection system.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• 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. <ul style="list-style-type: none"> <li>- When used outdoors.</li> <li>- When used indoors or in an enclosed area.</li> </ul> </li> </ul>	None	None
(xiii) Walk-behind milling machines and floor grinders	<ul style="list-style-type: none"> <li>• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• Use machine equipped with dust collection system recommended by the manufacturer.</li> <li>• Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>• 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.</li> <li>• When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.</li> </ul>	None	None

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## TECHNICAL DATA

**OSHA 29 CFR1926.1153 TABLE 1, cont.**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(xiv) Small drivable milling machines (less than half lane)	<ul style="list-style-type: none"> <li>Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
(xv) Large drivable milling machines (half lane or larger)	<p>For cuts of any depth on asphalt only:</p> <ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
	<p>For cuts of four inches in depth or less on any substrate:</p> <ul style="list-style-type: none"> <li>Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust.</li> <li>Operate and maintain machine to minimize dust emissions.</li> </ul>	None	None
	<p>OR</p> <ul style="list-style-type: none"> <li>Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant.</li> <li>Operate and maintain machine to minimize dust emissions</li> </ul>	None	None
(xvi) Crushing machines	<ul style="list-style-type: none"> <li>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).</li> <li>Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.</li> <li>Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.</li> </ul>	None	None

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**OSHA 29 CFR1926.1153 TABLE 1, cont.**

Equipment or Task	Engineering and Work Practice Control Methods	Respiratory Protection	
		≤ 4 hour shift	> 4 hour shift
(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"> <li>Operate equipment from within an enclosed cab.</li> <li>When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul>	None None	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"> <li>Apply water and/or dust suppressants as necessary to minimize dust emissions.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.</li> </ul>	None  None	None  None

OSHA's APFs (Assigned Protection Factors) correlate to specific types of facepieces and hoods. Reference the chart below and apply the correct PEL

RESPIRATOR	MAX CONC.	ASSIGNED PROTECTION FACTOR (APF)
APR Half Masks – includes disposables APR Full Face if qualitatively fit tested	<10 X PEL	10
APR Full Face if quantitatively fit tested	<50 X PEL	<b>50</b>
PAPR or SAR Half Mask	<50 X PEL	50
PAPR or SAR Full Face	<1,000 X PEL	1,000
PAPR or SAR Loose Fitting Facepiece (hood)	<25 X PEL	25
PAPR or SAR Helmet / Hood	< 50 PEL <1,000 x PEL	50 or; 1,000 if Manufacturer can provide data.
SAR Half Mask PD-SAR w/out escape	<50 X PEL	50
SAR Full Facepiece PD-SAR w/out escape	<1,000 x PEL	1,000
PD-SAR with escape	<1,000 X PEL	PD-SAR w/Escape – 1,000 (OSHA Approved for IDLH Escape)
Self-Contained Breathing Apparatus	<10,000 X PEL	10,000 & IDLH Atmospheres

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## TECHNICAL DATA

# Guide to Respiratory Protection from Silica

OSHA 29 CFR1910.1053 for General Industry

WORKSITE CONCENTRATION		HONEYWELL RESPIRATOR		
<25 µg/m <sup>3</sup> (0.025 mg/m <sup>3</sup> )	Below Action Level	No respiratory protection is required		
<50 µg/m <sup>3</sup> (0.05 mg/m <sup>3</sup> )	Below Action Level	No respiratory protection is required		
<500 µg/m <sup>3</sup> (0.5 mg/m <sup>3</sup> )	10 X PEL	N95 Filtering Facepieces		
		Style	No Valve	With Valve
		ONE-Fit	14110444	14110445
		Saf-T-Fit 1105	14110387 (small) 14110388 (med) 14110389 (large)	
		Saf-T-Fit 1115 Saf-T-Fit 1125	14110390 (small) 14110391 (med) 14110392 (large)	14110393 (small) 14110394 (med) 14110395 (large)
		Limited Use Air-Purifying Half Mask		
		4200S, M, L	Half Mask with N95 Filter	
		7190N99	Welding Half Mask with N99 Filter	
		Reusable Air-Purifying Half Mask		
		Half Mask	Filter	Adapter
		7700 Series	7506N95	N750037
		RU8500 Series	7580P100	N/A
		5500 Series	75FFP100	N/A
		Air-Purifying Full Facepiece		
		Facepiece	Filter	Adapter
10 X PEL If Qualitatively Fit Tested*	7600 Series	7506N95	N750037	
	RU6500 Series	7580P100	N/A	
	5400 Series	75FFP100	N/A	
<1,250 µg/m <sup>3</sup> (1.25 mg/m <sup>3</sup> )	25 X PEL	Powered Air-Purifying Respirator (PAPR)		
		Loose Fitting Hood	PAPR Assembly	HEPA Filter
		PA101S, M	CA201 CA201D	40HE
<2,500 µg/m <sup>3</sup> (2.5 mg/m <sup>3</sup> )	50 X PEL If Quantitatively Fit Tested	Air-Purifying Full Facepiece		
		Facepiece	Filter	Adapter
		7600 Series	7506N95	N750037
		RU6500 Series	7580P100	N/A
		5400Series	75FFP100	N/A



\* Air-Purifying Facepieces must be Quantitatively Fit Tested to achieve a Fit Factor of 50

For more information  
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TECHNICAL DATA

# Guide to Respiratory Protection from Silica

OSHA 29 CFR1910.1053 for General Industry

WORKSITE CONCENTRATION		HONEYWELL RESPIRATOR		
$<50,000 \mu\text{g}/\text{m}^3$ (50 mg/m <sup>3</sup> )	1,000 X PEL	<b>Powered Air-Purifying Respirator (PAPR)</b>		
		<b>Facepiece</b>	<b>PAPR Assy</b>	<b>HEPA Filter</b>
		54001, S RU65001S, M, L* RU65002S, M, L* 760008A, S	Belt Mounted CA201 CA201D	40HE
		RU65001 (included with PR501)	Mask Mounted PR501S, M, L	108000 108044 (Bulk)
		<b>Hood</b>	<b>PAPR Assy</b>	<b>HEPA Filter</b>
		PA111, PA121 PA131, PA141 PA201E01 PA301	Belt Mounted CA201 CA201D	40HE
		<b>Continuous Flow Supplied Air Respirator</b>		
		<b>Facepiece</b>	<b>Breathing Tube Assembly</b>	<b>Hoses &amp; Couplers</b>
		54001, S RU65001S, M, L RU65002S, M, L 760008A, S	CF2007	Breathing Air Hose 9000 Series
		RU65001S, M, L RU65002S, M, L	CF4000	Couplers Cejn, Hansen, Foster, Schrader, Snap-Tite
		PA111, PA121 PA131, PA141 PA201, PA301	CF1000	
		<b>Abrasive Blasting Continuous Flow Respirator</b>		
<b>Assembly</b>	<b>Hoses &amp; Couplers</b>			
CF7001US, CF7001SUS	Breathing Air Hose: 9000 Series Couplers: Cejn, Hansen, Foster, Schrader, Snap-Tite			
$<500,000 \mu\text{g}/\text{m}^3$ (500 mg/m <sup>3</sup> )	10,000 X PEL	<b>Pressure Demand Supplied Air Respirator</b>		
		<b>Assembly</b>	<b>Hoses &amp; Couplers</b>	
		Panther Series • No cylinder • 5 min cylinder • 10 min cylinder • 15 min cylinder	Breathing Air Hose: 3/8" Industrial 3/8" High Performance Couplers: Foster, Hansen, Schrader,	
		<b>Self-Contained Breathing Apparatus</b>		
		888888	Cougar, 30 minute, low pressure	
		555555	Cougar, 60 minute, high pressure	
		777777	PUMA, 30 minute, low pressure	



\* NIOSH approval pending

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## TECHNICAL DATA

### Guide to Respiratory Protection from Silica

OSHA 29 CFR 1910.1053 for General Industry

When Engineering and Administrative controls are insufficient in reducing employees' exposure to respirable crystalline silica, respiratory protection is required. The General Industry and Maritime Standard, 29 CFR 1910.1053 and Construction Standard 29 CFR 1926.1153 require a Respiratory Protection Program per OSHA Standard 29 CFR 1910.134.

The suggestions below are for exposure to respirable crystalline silica only. If there are other contaminants present additional respiratory protection may be required. If there are oil-based aerosols present an R or P type filter must be used.



WORKSITE CONCENTRATION		HONEYWELL RESPIRATOR		
<25 µg/m <sup>3</sup> (0.025 mg/m <sup>3</sup> )	Below Action Level	No respiratory protection is required		
<50 µg/m <sup>3</sup> (0.05 mg/m <sup>3</sup> )	Below Action Level	No respiratory protection is required		
<500 µg/m <sup>3</sup> (0.5mg/m <sup>3</sup> )	10 X PEL	<b>N95 Filtering Facepieces</b>		
		Style	No Valve	With Valve
		ONE-Fit	14110444	14110445
		Saf-T-Fit 1105	14110387 (small) 14110388 (med) 14110389 (large)	14110393 (small) 14110394 (med) 14110395 (large)
		Saf-T-Fit 1115 Saf-T-Fit 1125	14110390 (small) 14110391 (med) 14110392 (large)	
		<b>Limited Use Air-Purifying Half Mask</b>		
		4200S, M, L	Half Mask with N95 Filter	
		7190N99	Welding Half Mask with N99 Filter	
		<b>Reusable Air-Purifying Half Mask</b>		
		Half Mask	Filter	Adapter
		7700 Series	7506N95	N750037
		RU8500 Series	7580P100	N/A
		5500 Series	75FFP100	
		<b>Air-Purifying Full Facepiece</b>		
		Facepiece	Filter	Adapter
10 X PEL If Qualitatively Fit Tested*	7600 Series	7506N95	N750037	
	RU6500 Series	7580P100	N/A	
	5400 Series	75FFP100		
<1,250 µg/m <sup>3</sup> (1.25 mg/m <sup>3</sup> )	25 X PEL	<b>Powered Air-Purifying Respirator (PAPR)</b>		
		Loose Fitting Hood	PAPR Assembly	HEPA Filter
		PA101S, M	CA201 CA201D	40HE
<2,500 µg/m <sup>3</sup> (2.5 mg/m <sup>3</sup> )	50 X PEL If Quantitatively Fit Tested	<b>Air-Purifying Full Facepiece</b>		
		Facepiece	Filter	Adapter
		7600 Series	7506N95	N750037
		RU6500 Series	7580P100	N/A
		5400Series	75FFP100	



\* Air-Purifying Facepieces must be Quantitatively Fit Tested to achieve a Fit Factor of 50

TECHNICAL DATA

# Guide to Respiratory Protection from Silica

OSHA 29 CFR1910.1053 for General Industry

WORKSITE CONCENTRATION		HONEYWELL RESPIRATOR		
<50,000 µg/m <sup>3</sup> (50 mg/m <sup>3</sup> )	1,000 X PEL	<b>Powered Air-Purifying Respirator (PAPR)</b>		
		<b>Facepiece</b>	<b>PAPR Assy</b>	<b>HEPA Filter</b>
		54001, S RU65001S, M, L* RU65002S, M, L* 760008A, S	Belt Mounted CA201 CA201D	40HE
		RU65001 (included with PR501)	Mask Mounted PR501S, M, L	108000 108044 (Bulk)
		<b>Hood</b>	<b>PAPR Assy</b>	<b>HEPA Filter</b>
		PA111, PA121 PA131, PA141 PA201E01 PA301	Belt Mounted CA201 CA201D	40HE
		<b>Continuous Flow Supplied Air Respirator</b>		
		<b>Facepiece</b>	<b>Breathing Tube Assembly</b>	<b>Hoses &amp; Couplers</b>
		54001, S RU65001S, M, L RU65002S, M, L 760008A, S	CF2007	Breathing Air Hose 9000 Series
		RU65001S, M, L RU65002S, M, L	CF4000	Couplers Cejn, Hansen, Foster, Schrader, Snap-Tite
		PA111, PA121 PA131, PA141 PA201, PA301	CF1000	
		<b>Abrasive Blasting Continuous Flow Respirator</b>		
<b>Assembly</b>	<b>Hoses &amp; Couplers</b>			
CF7001US, CF7001SUS	Breathing Air Hose: 9000 Series Couplers: Cejn, Hansen, Foster, Schrader, Snap-Tite			
<500,000 µg/m <sup>3</sup> (500 mg/m <sup>3</sup> )	10,000 X PEL	<b>Pressure Demand Supplied Air Respirator</b>		
		<b>Assembly</b>	<b>Hoses &amp; Couplers</b>	
		Panther Series • No cylinder • 5 min cylinder • 10 min cylinder • 15 min cylinder	Breathing Air Hose: 3/8" Industrial 3/8" High Performance Couplers: Foster, Hansen, Schrader,	
		<b>Self-Contained Breathing Apparatus</b>		
		888888	Cougar, 30 minute, low pressure	
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## FREQUENTLY ASKED QUESTIONS

### OSHA Standard for Protection from Silica Exposure

29 CFR 1910.1053 Standard for General Industry and Maritime

29 CFR 1926.1153 Standard for Construction

The Occupational Safety and Health Administration (OSHA) has promulgated the Final Rule for occupational exposures to respirable crystalline silica. There are two separate Standards, the first covers General Industry and Maritime, and the second covers Construction. While there are similarities between the two, there are some significant differences with some of the requirements. This document addresses questions that you may be asked by your customers. Please refer to the Honeywell Technical Data Sheet for an overview of the General Industry and Construction Standards. Copies of the complete Standards and Amendments can be found of the Honeywell web site [honeywellsafety.com](http://honeywellsafety.com). Agricultural operations are covered by 29 CFR Part 1928.

**Q1: What is Silica?**

**A1:** Silica is a compound of the two most abundant elements in Earth's crust, silicon and oxygen. Its chemical name is silicon dioxide, with the symbol SiO<sub>2</sub>. There are three main crystalline varieties of silica. The most common is quartz, which comprises 13% of the Earth's crust. The other two are cristobalite and tridymite. Small, airborne particles of silica, referred to as respirable crystalline silica, can penetrate deep into the lungs and can be harmful if exposed for long durations.

**Q2: Why did OSHA create a new Standard for exposure to Silica?**

**A2:** OSHA has determined that the previous permissible exposure limits (PEL) of 10 milligrams per cubic meter (10 mg/m<sup>3</sup>) for respirable crystalline silica did not adequately protect workers, exposing them to an increased risk of developing silicosis and other non-malignant respiratory diseases, lung cancer, and kidney disease.

**Q3: What are the most significant changes from the previous regulation for protection from silica?**

**A3:** Respirable crystalline silica, which includes quartz, cristobalite and tridymite, is included in OSHA's Table Z for particulate exposure. This Table provides guidance in determining the PELs for several hazardous particulates. All other requirements for protection from silica in all forms was covered by the various overarching OSHA standards, including those for Hazard Communication, Medical Evaluations and Record Keeping. The two new silica standards consolidates these elements, plus includes specific worker safety requirements not included in the more general standards covering these topics. The most significant changes include:

- a) The Permissible Exposure Limit (PEL) has been reduced from 10 mg/m<sup>3</sup> to 50 micrograms per cubic meter (50 µg/m<sup>3</sup>) for silica as quartz. The PEL for the other two forms of silica were already close to 50 µg/m<sup>3</sup>.
- b) An Action Level of 25 micrograms per cubic meter (25 µg/m<sup>3</sup>) has been added.
- c) A written exposure control plan and specific housekeeping steps to minimize exposure by employees are required.
- d) There are specific medical conditions that must be reviewed during the OSHA Medical Evaluation, plus a medical examination is required initially as a baseline and every three (3) years as long as the exposure continues.
- e) Hazard communication and training also have specific requirements that stress the importance of minimizing exposure to respirable crystalline silica.

## FREQUENTLY ASKED QUESTIONS

**Q4: What criteria did OSHA use when establishing the PEL at 50 µg/m<sup>3</sup>?**

**A4:** The new PEL for silica is based on evidence OSHA evaluated during the rulemaking process. It is OSHA's determination that a PEL of 50 µg/m<sup>3</sup> is appropriate because it is the lowest level technologically feasible for most operations in the affected industries. OSHA does recognize that a PEL of 50 µg/m<sup>3</sup> will be a challenge for several affected sectors, and thus the use of respirators for a limited number of job categories and tasks will be required.

**Q5: Why did OSHA create two different Standards, one for General & Maritime Industries, and one for the Construction Industry?**

**A5:** OSHA issued two Standards in order to tailor the requirements to specific circumstances found in the different industries. The Silica Standard for General Industry and Maritime is similar to other contaminant specific standards, focusing on the exposure rather than the task. When reviewing silica exposure in the Construction industry, OSHA identified application groups based on construction activities, tasks, or equipment that are commonly recognized to create silica exposures.

**Q6: What are the main differences between the two Standards?**

**A6:** Some key differences are noted below.

- a) The dates that companies must be in compliance are different. Most notably companies in the construction industry must be in full compliance by June 23, 2017 while companies involved in general industry and shipyards have until June 23, 2018 to be in full compliance.
- b) Engineering out contaminant exposure is the preferred method for all industries. The Construction Standard includes a table of activities and recommended engineering practices. This table also includes information on when and what type of respiratory protection must be used for the different activities, with and without implementing engineering practices.
- c) The Construction Standard requires medical surveillance of all employees exposed to silica 30 or more days per year, regardless of whether the exposure is at or above the Action Level. The General Industry Standard requires the medical surveillance if the exposure is at or above the Action Level (25 µg/m<sup>3</sup>) for 30 or more days per year.
- d) Both the General Industry Standard and the Construction Standards require a written exposure control plan, however the Construction Standard also requires that the Program Manager responsible for the exposure control plan be identified and communicated to employees.

**Q7: What industries include activities where workers are exposed to silica?**

**A7:** Some common industries include:

Asphalt Paving Products	Nonferrous Sand Casting Foundries
Asphalt Roofing Materials	Non-Sand Casting Foundries
Hydraulic Fracturing	Other Ferrous Sand Casting Foundries
Industries with Captive Foundries	Other Glass Products
Concrete Products	Paint and Coatings
Cut Stone	Porcelain Enameling
Dental Equipment and Supplies	Pottery
Dental Laboratories	Railroads
Flat Glass	Ready-Mix Concrete
Iron Foundries	Refractories
Jewelry	Refractory Repair
Mineral Processing	Shipyards
Mineral Wool	Structural Clay

## FREQUENTLY ASKED QUESTIONS

### OSHA Standard for Protection from Silica Exposure

29 CFR 1910.1053 Standard for General Industry and Maritime

29 CFR 1926.1153 Standard for Construction

**Q8: What are the activities in the construction industry where workers are exposed to silica?**

**A8:** Some common activities include:

- 1) Stationary masonry saws
- 2) Handheld power saws (any blade diameter)
- 3) Handheld power saws for cutting fiber-cement board (with blade diameter of 8" or less)
- 4) Walk-behind saws
- 5) Drivable saws
- 6) Rig-mounted core saws or drills
- 7) Handheld and stand-mounted drills (including impact and rotary hammer drills)
- 8) Dowel drilling rigs for concrete
- 9) Vehicle-mounted drilling rigs for rock and concrete
- 10) Jackhammers and handheld powered chipping tools
- 11) Handheld grinders for mortar removal (i.e., tuck pointing)
- 12) Handheld grinders for uses other than mortar removal
- 13) Walk-behind milling machines and floor grinders
- 14) Small drivable milling machines (less than half-lane)
- 15) Large drivable milling machines (half-lane and larger)
- 16) Crushing machines
- 17) 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
- 18) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials

**Q9: What type of respiratory protection should be used for exposure to respirable crystalline silica?**

**A9:** Respirable crystalline silica is a particulate, so depending on the concentration workers should be provided with either a filtering facepiece or a reusable facepiece with filters. Filters may be any of the nine designations established by the National Institute for Occupational Safety and Health (NIOSH). The classifications are 'N' (non oil-based aerosols present), 'R' (oil-based aerosols may be present but filters are limited to one 8 hour shift) and "P" (oil-based aerosols may be present), and either 95%, 99% or 99.97% efficient.

Refer to the Honeywell Respirator Selection Guide for Protection from Silica for a listing of appropriate Honeywell respirators.

**For more information**

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