



## OSHA Silica Rule (29 CFR 1926.1153) Compliance Instructions

D2217/D2218/D2227/D2230D2247/2248 DustBubble

Website: [www.dustlesstools.com](http://www.dustlesstools.com)  
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- Compliant with Paragraph d, (2), (ii) Alternative Exposure Control Methods when used with objective data.
- Drill maximum of 2 inches per DustBubble, wipe off dust and install new one for deeper drilling. Dispose of used DustBubbles in a trash can or small trash bag on tool belt.
- A HEPA vacuum is required to clean out drill holes.

Task	Table 1 Compliant?	Objective Data Required?	Objective Data Available	Minimum CFM required	Recommended Dust Collector	Notes
Hammer Drill with DustBubble	No	Yes	See below	None	HEPA Backpack or HEPA Wet+Dry (for cleaning drill holes)	Drill maximum of 2 inches per DustBubble, wipe off dust and install new DustBubble for deeper drilling. HEPA vacuum required to clean out holes.

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**Description of calculations:** An IQ Air Particle Scan Pro was used to collect air samples during the testing. It was placed in the operator's personal breathing zone. Readings for concrete drilling are shown in the following two tables.

The operator was drilled 11 holes through a 4-inch thick slab of cured concrete with a 3/8-inch Dewalt™ masonry bit. He was working in a 21' x 21.3' x 10' room without windows and with doors closed. The operator followed normal product use procedures, which included installing the DustBubble® by peeling off the adhesive backing, pulling the DustBubble™ into an expanded position, drilling, removing the DustBubble, and discarding it in a can next to the operator.

The operator drilled two inches deep for each DustBubble used to ensure it did not overflow, removed the first DustBubble, and installed a new one over the hole and finished drilling another two inches through the slab.

The operator was drilling for the entire time monitored, and although dust may continue to accumulate in the air over an 8-hour day, the levels were low enough to be confident the silica levels would exceed neither the action level or the PEL even if the operator worked non-stop for an entire work day.

The Particle Scan Pro readings indicate how many particles of each size were detected over the indicated time periods, therefore, to isolate the sizes and convert the particles to micrograms, the next smaller size range was subtracted from the previous larger one, leaving the approximate number of particles that size or smaller. This number was then multiplied by the micron size number and the value of an average weight for a micron of concrete dust.

**Description of testing conditions:**

Method of drilling: dry

Total time assessed: 1 hour, 0.00 minutes, 49 seconds

Drill: Milwaukee M18™ Cordless 1/2" Hammer Drill/Driver (part # 2602-20)

Bit: 3/8-inch Dewalt carbide masonry bit

Shroud: D2247/D2248 Industrial-Strength Dustless Technologies DustBubble.

Vacuum: None

Particle Counter: IQ Air Particle Scan Pro™. Placed even with the operator's head, in the Personal Breathing Zone (PBZ)

Room specifications: 21-ft x 21.3-ft x 10-ft room without windows and with doors closed. Room is not serviced by forced air circulation systems. Air filtration installed in the room was turned off. Both doors into the room were closed.

Material drilled: 2-ft x 2-ft x 4-inch cured concrete slab laboratory tested at 9.3% silica content.

Depth of each hole: 4 inches (two DustBubbles used per hole, each collecting for 2-inches of concrete).

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Measurements per cubic foot of air									
	Timestamp	>0.3	>0.5	>0.7	>1.0	>3.0	>5.0	Model	Unit
Drilling (3/8-in masonry bit)	13:52:50 thru 14:53:39	1,431,537	775,414	615,783	407,724	245,701	76,090	IQ Air Pro	per ft3
Amount <each size		656,123.3	159,631.3	208,058.7	162,022.7	169,611.3	76,090.0	IQ Air Pro	per ft3
Micrograms of dust		81.8	33.2	60.5	67.3	211.4	158.1	IQ Air Pro	per ft3

Measurements per cubic meter of air									
	Timestamp								
Drilling (3/8-in masonry bit)	13:52:50 thru 14:53:39	40,536.6	21,957.2	17,437.0	11,545.4	6,957.5	2,154.6	#REF!	Per m3
Amount <each size		18,579.3	4,520.2	5,891.6	4,588.0	4,802.9	2,154.6	#REF!	Per m3
Micrograms of dust		2.3	0.9	1.7	1.9	6.0	9.0	IQ Air Pro	Per m3
Amount of silica		0.2	0.1	0.2	0.2	0.6	0.8	IQ Air Pro	Per m3
APF		0.0	0.0	0.0	0.0	0.0	0.0		

Variables for calculation				
Silica PEL	5.00E+01	micrograms	per cubic meter	
	1.00E+09	cubic microns	per cubic mm	
	2.41E-06	kg	of concrete per cubic mm	
	1.00E-09	kg	per microgram	
A micron of concrete weighs	4.15E-04	micrograms		
Cubic foot is	2.83E-02	Cubic meters		
% silica in concrete	9.30%			

Analysis Summary		
Total µG of silica	2.03	<50µG PEL <25µG Action level
Max APF required	0.04	No APF Req'd

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