



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

Website: [www.dustlesstools.com](http://www.dustlesstools.com)  
Phone: (800) 568-3949

### D1908 8-Inch BitBuddie

- Compliant with Table 1, Section (vii) when using handheld or stand-mounted drills (including impact and rotary hammer drills). Manufacturer recommends a minimum airflow of 125 CFM. Use a Dustless HEPA Wet+Dry, Wet+Dry, DustDroid 300, or DustDroid 600 to collect dust. A HEPA vacuum is required to clean out drill holes.
- When drilling overhead, use the bit to cut the hole in the BitBuddie. This will ensure close fit around the bit and maximum collection. This method is also recommended when using on vertical surfaces or floors.
- When using the BitBuddies, if large pieces begin to block the dust collection slots, stop drilling and slightly lift the BitBuddie to allow the dust collector to vacuum them up.
- When removing the core from core bits, use the vacuum hose placed below to collect dust as it falls out of the bit.
- Compliant with Table 1, Section (vi) Rig-mounted core saws or drills when used with an integrated water delivery system. Use a Dustless Wet+Dry, HEPA Wet+Dry vacuum or Slurry Vac to collect slurry.
- Compliant with Paragraph d, (2), (ii) Alternative Exposure Control Methods when used with objective data when core drilling without water delivery. Objective data is available at the Objective Data Link on this page.
- Wear the protective equipment meeting the APF recommendation in Table 1 or the objective data. Always use eye and ear protection.

Task	Table 1 Compliant	Objective Data Required	Objective Data Available	Minimum CFM	Recommended Dust Collector	Notes
Hammer drill with 4-inch BitBuddie	Yes	No	N/A	119	Wet+Dry, HEPA Wet+Dry, HEPA Backpack	If dust starts to collect around bit, slightly lift the BitBuddie to allow vacuum to collect larger chunks blocking air slots.
Wet core drilling with a hammer drill or angle grinder with BitBuddie	Yes	No	N/A	115	Wet+Dry, HEPA Wet+Dry, Slurry Vac	If slurry starts to collect around bit or flow around shroud, slightly lift the BitBuddie to allow vacuum to collect larger chunks blocking air slots.
Dry core drilling with a hammer drill or angle grinder with 4 BitBuddie	No	Yes	See below	119	Wet+Dry, HEPA Wet+Dry, HEPA Backpack, DustDroid 300, DustDroid 600	If dust starts to collect around bit, slightly lift the BitBuddie to allow vacuum to collect larger chunks blocking air slots.

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## Objective Data for D1908 8-Inch BitBuddie 1.25-in Bit Dry Coring (3-in hole in shroud)

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**Description of calculations:** An IQ Air Particle Scan Pro was used while coring concrete with a 2.5-inch coring bit. Readings for baseline and coring are shown in the following two tabs. The top two and bottom two readings were eliminated to compensate for the time required for the operator to get the scanner running and to turn it off after operation. The operator was coring for the entire time monitored, therefore readings would be the same for a TWA if the operator cored non-stop the entire 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.

This result was then multiplied by 9.3% which was the silica content determined by laboratory analysis of a sample of the concrete used, which was conducted by Terracon Consulting during separate product testing. The resulting number is the amount of silica per cubic meter of air.

The final calculation indicates the minimum Assigned Protection Factor (APF). This was calculated by dividing the concentration of silica by the PEL as explained in OSHA 3352-02 2009.

### **Description of testing conditions:**

Method of coring: dry

Total time assessed: 2:48 minutes

Grinder: Milwaukee 6088-30 6-inch angle grinder

Bit: 2.5-inch coring bit

Shroud: 4-inch Dustless Technologies BitBUddie (D1905). A 3-inch coring bit was used to make the cutout in the shroud, resulting in a .25-inch gap around the bit. While a snugger fit would have been more ideal, this objective data shows that even with this gap around the bit, the BitBuddie still effectively contains the dust.

Vacuum: Dustless Wet+Dry 16-gallon shop vacuum rated at 130 CFM. While the D1908 was not tested, its larger hose port increases airflow, making this data valid for both shrouds.

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

Depth of core: 4 ea. cores at 2.4in, 2.2in, 1.7in, 1.8in. Total of 8.1 inches

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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
Coring	12:17:18 PM thru 12:19:12 PM	6,927,093.9	2,906,971.4	2,256,089.8	1,736,734.7	1,286,971.4	437,502.0	IQ Air Pro	per ft3
Amount <each size		4,020,122.4	650,881.6	519,355.1	449,763.3	849,469.4	437,502.0	IQ Air Pro	per ft3
Micrograms of dust		501.1	135.2	151.0	186.9	1,058.7	908.8	IQ Air Pro	per ft3

Measurements per cubic meter of air									
	Timestamp								
Coring	12:17:18 PM thru 12:19:12 PM	196,153.1	82,316.1	63,885.2	49,178.8	36,442.9	12,388.7	IQ Air Pro	Per m3
Amount <each size		113,837.0	18,430.9	14,706.5	12,735.9	24,054.3	12,388.7	IQ Air Pro	Per m3
Micrograms of dust		14.2	3.8	4.3	5.3	30.0	51.5	IQ Air Pro	Per m3
Amount of silica		1.3	0.4	0.4	0.5	2.8	4.8	IQ Air Pro	Per m3
APF		0.0	0.0	0.0	0.0	0.1	0.1		

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	10.14	<50µG PEL <25µG Action level
Max APF required	0.20	No APF Req'd

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**Description of calculations:** An IQ Air Particle Scan Pro was used while coring concrete with a 3-inch coring bit. Readings for baseline and coring are shown in the following two tabs. The top two and bottom two readings were eliminated to compensate for the time required for the operator to get the scanner running and to turn it off after operation. The operator was coring for the entire time monitored, therefore readings would be the same for a TWA if the operator cored non-stop the entire 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.

This result was then multiplied by 9.3% which was the silica content determined by laboratory analysis of a sample of the concrete used, which was conducted by Terracon Consulting during separate product testing. The resulting number is the amount of silica per cubic meter of air.

The final calculation indicates the minimum Assigned Protection Factor (APF). This was calculated by dividing the concentration of silica by the PEL as explained in OSHA 3352-02 2009.

### **Description of testing conditions:**

Method of coring: dry

Total time assessed: 1:54 minutes

Grinder: Milwaukee 6088-30 6-inch angle grinder

Bit: 3-inch coring bit

Shroud: 4-inch Dustless Technologies BitBuddie (D1905). Coring bit was used to make the cutout in the shroud, resulting in a snug fit around the bit, minimizing dust.

Vacuum: Dustless Wet+Dry 16-gallon shop vacuum rated at 130 CFM. While the D1908 was not tested, its larger hose port increases airflow, making this data valid for both shrouds

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

Depth of core: 2.243 inches

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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
Coring	12:17:18 PM thru 12:19:12 PM	6,307,300.0	824,940.0	285,360.0	156,840.0	56,120.0	2,780.0	IQ Air Pro	per ft3
Amount <each size		5,482,360.0	539,580.0	128,520.0	100,720.0	53,340.0	2,780.0	IQ Air Pro	per ft3
Micrograms of dust		683.3	112.1	37.4	41.8	66.5	5.8	IQ Air Pro	per ft3

Measurements per cubic meter of air									
	Timestamp								
Coring	12:17:18 PM thru 12:19:12 PM	178,602.6	23,359.7	8,080.5	4,441.2	1,589.1	78.7	#REF!	Per m3
Amount <each size		155,242.9	15,279.2	3,639.3	2,852.1	1,510.4	78.7	#REF!	Per m3
Micrograms of dust		19.3	3.2	1.1	1.2	1.9	0.3	IQ Air Pro	Per m3
Amount of silica		1.8	0.3	0.1	0.1	0.2	0.0	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		
<b>Total µG of silica</b>	2.51	<50µG PEL <25µG Action level
<b>Max APF required</b>	0.05	No APF Req'd

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**Description of calculations:** An IQ Air Particle Scan Pro was used while coring concrete with a 2.5-inch coring bit. Readings for baseline and coring are shown in the following two tabs. The top two and bottom two readings were eliminated to compensate for the time required for the operator to get the scanner running and to turn it off after operation. The operator was coring for the entire time monitored, therefore readings would be the same for a TWA if the operator cored non-stop the entire day.

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The final calculation indicates the minimum Assigned Protection Factor (APF). This was calculated by dividing the concentration of silica by the PEL as explained in OSHA 3352-02 2009.

**Description of testing conditions:**

Method of coring: dry

Total time assessed: 2:48 minutes

Grinder: Milwaukee 6088-30 6-inch angle grinder

Bit: 2.5-inch coring bit

Shroud: 4-inch Dustless Technologies BitBuddie (D1905). A 3-inch coring bit was used to make the cutout in the shroud, resulting in a .25-inch gap around the bit. While a snugger fit would have been more ideal, this objective data shows that even with this gap around the bit, the BitBuddie still effectively contains the dust.

Vacuum: Dustless Wet+Dry 16-gallon shop vacuum rated at 130 CFM. While the D1908 was not tested, its larger hose port increases airflow, making this data valid for both shrouds

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

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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
Coring	12:17:18 PM thru 12:19:12 PM	9,425,660.6	2,480,351.5	1,535,357.6	1,080,933.3	646,533.3	64,654.5	IQ Air Pro	per ft3
Amount <each size		6,945,309.1	944,993.9	454,424.2	434,400.0	581,878.8	64,654.5	IQ Air Pro	per ft3
Micrograms of dust		865.6	196.3	132.2	180.5	725.2	134.3	IQ Air Pro	per ft3

Measurements per cubic meter of air									
	Timestamp								
Coring	12:17:18 PM thru 12:19:12 PM	266,904.5	70,235.6	43,476.4	30,608.6	18,307.8	1,830.8	IQ Air Pro	Per m3
Amount <each size		196,668.9	26,759.2	12,867.8	12,300.8	16,476.9	1,830.8	IQ Air Pro	Per m3
Micrograms of dust		24.5	5.6	3.7	5.1	20.5	7.6	IQ Air Pro	Per m3
Amount of silica		2.3	0.5	0.3	0.5	1.9	0.7	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	6.24	<50µG PEL <25µG Action level
Max APF required	0.12	No APF Req'd

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