




# MILWAUKEE TOOL

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To Whom It May Concern,

Milwaukee®, in partnership with Industrial Hygiene Sciences, LLC, has conducted testing on the Milwaukee M18™ FUEL™ 3-in-1 Backpack Vacuum (0885-20) paired with the M18™ FUEL™ 1-9/16” SDS Max Rotary Hammer Drill (2717-20), 1 ¼” X 15” SDS Max 4 Carbide Tip (48-20-3970), and SDS Max Dust Extraction Attachment. Results show that the user will be below the Permissible Exposure Limit (PEL) as described by OSHA 29 CFR 1926.1153 when using the above combination, assuming it is used in accordance with manufacturer’s instructions. Testing results and procedures are outlined below:

Unit Tested	Average Holes Drilled	Average Sample Duration	% Silica (Quartz) in Sample	Average Respirable Crystalline Silica Concentration (µg/m³)	OSHA PEL in 1926.1153
	17.5	60.6	8.8	6.1 µg/m³ TWA	50 µg/m³

- All drilling was performed using a Milwaukee M18™ FUEL™ 3-in-1 Backpack Vacuum (0885-20) paired with the M18™ FUEL™ 1-9/16” SDS Max Rotary Hammer Drill (2717-20), 1 ¼” X 15” SDS Max 4 Carbide Tip (48-20-3970), and SDS Max Dust Extraction Attachment.
- The drilling was completed horizontally to mounted concrete and drilled through the depth of a 4” block
- Vacuum was turned to mode 2
- HEPA filter was cleaned every 2 holes with the following method
  - User removed canister from unit and took off the cap that sits above the HEPA filter. The cap was used to clean the filter by tapping downward aggressively 4 times on top of the filter while it was still in the canister. The canister was then emptied into a garbage can at foot level.
- Concrete blocks were poured from a 5000 PSI concrete mix.
- The room size was 12’9” x 26’5” x 8’
- The room surfaces were wiped down between trials to ensure accurate measurements
- Samples were collected on 3 piece 37 mm diameter preweighed PVC filter mounted in a BGI GK2.69 respirable dust sampler, run at 4.2 lpm and connected to a Gilian 10i air sampling pump. A field blank was submitted with each day’s set of samples.
- Samples were analyzed using OSHA ID-142 by the Wisconsin Occupational Health Laboratory, an AIHA Accredited laboratory. The sampling method used meets the definition of respirable crystalline silica in 1926.1153 (a) and Appendix A of the OSHA Respirable Crystalline Silica Standard (1926.1153).
- The Time Weighted Average (TWA) was calculated assuming zero exposure to respirable crystalline silica for the non-sampled portion of a 480 minute (8 hour) shift. Longer exposure times, assuming that the dust exposures would be similar to those collected in these trials, would likely result in higher TWAs. Factors, including, but not limited to the ventilation and air flow patterns in the space where the work is done, how flat the grinder is held, the condition of the shroud brush, the silica content of the concrete, how much grinding was done when the shroud is not on a full, flat surface, the presence of other respirable silica dust generating activities in the area, how often the user knocks collected dust from the HEPA filter, how aggressively the HEPA filter is knocked off and how the vacuum is cleaned could affect actual user exposures.

\*A 1-1/4" SDS Max drill bit reflects the dust generating application used in this test, the table below suggest other bit sizes based on volume of dust would also be compliant when using the Milwaukee M18™ FUEL™ 3-in-1 Backpack Vacuum

Details on how to properly implement as a part of a complete exposure plan are outlined below\*:

### Maximum Numbers of Holes per Day\*\*

		Hole Diameter					
		1"	1-1/4"	1-1/2"	1-3/4"	2"	2-1/2"
Hole Depth	1"	875	560	389	286	219	140
	1.5"	583	373	259	190	146	93
	2"	438	280	194	143	109	70
	2.5"	350	224	156	114	88	56
	3"	292	187	130	95	73	47
	3.5"	250	160	111	82	63	40
	4"	219	140	97	71	55	35
	5"	175	112	78	57	44	28
	6"	146	93	65	48	36	23

\* These calculations are offered for reference and are calculated values based on previously recorded test data and represent a full work day of the tested application

\*\* The user must drill the same number or fewer holes than those listed above for the given application in order to be considered compliant with the objective data clause of 29 CFR 1926.1153 OSHA regulation on crystalline silica dust.

It is the responsibility of the user to operate the tool in accordance with manufacturer's instructions. For the latest listings of approvals, visit [milwaukeetool.com](http://milwaukeetool.com). For technical or service assistance, contact Milwaukee Customer Service at 1-800-729-3878.