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 (0895-20) with kitted HEPA filter (49-90-1961) paired with the M18 FUEL™ 1" SDS Plus D-Handle Rotary Hammer (2613-20), SDS Plus 5/8" X 8" 2-Cutter Carbide Tip Bit (48-20-7602), and the Vacuum Assisted Dust Extractor (5261-DE). 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	# of Holes Drilled	Average Sample Duration	% Silica (Quartz) in Sample	Average Respirable Crystalline Silica Concentration (µg/m³)	OSHA PEL in 1926.1153 (µg/m³)
	30	60 minutes	19%	5.3 µg/m³ TWA	50 µg/m³

Additional Test Information

- All drilling was performed using a Milwaukee M18™ FUEL™ 3-in-1 Backpack Vacuum (0895-20) paired with the M18 FUEL™ 1" SDS Plus D-Handle Rotary Hammer (2713-20), SDS Plus 5/8" X 8" 2-Cutter Carbide Tip Bit (48-20-7602), and the Vacuum Assisted Dust Extractor (5261-DE).
- In each trial, 30 four-inch holes were drilled overhead into a concrete block.
- Concrete Blocks were poured from a 5000 PSI concrete mix into 4' X 4' X 8' frames and positioned in an overhead fixture.
- After every 4 holes drilled, the HEPA Filter was knocked out into a bin. After every 8 holes drilled, the Vacuum Tank was emptied.
- A new HEPA filter was used for each new trial.
- The Vacuum was turned to high speed.

Sample Method

- 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 GilAir Plus air sampling pump. The flow rate through the sampling train was measured using a Mesa Labs Defender 520 calibrator before and after each Trial. A field blank was submitted with the batch of samples.
- The samples and blank 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).
- Work was performed in a room with no outside ventilation. The room door was closed. An ambient air cleaner with HEPA filtration was used between each trial to clean the air.

TWA Calculation

- The Time Weighted Average (TWA) was calculated assuming zero exposure to respirable crystalline silica for the non-sampled portion of a 480 minutes (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, the condition of the dust extractor boot, the positioning of the boot on the chisel, clogging of the air intake of the boot, the silica content of the concrete, the presence of other respirable silica dust generating activities in the area, and vacuum maintenance could affect actual user exposures.

*A 5/8” X 8” SDS Plus 2-Cutter Carbide Tip 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 Number of Holes per Day**

Hole Diameter

Hole Depth	3/16”	¼”	3/8”	½”	5/8”	¾”	7/8”	1”	1-1/8”	1-1/4”
1”	12,579	7,075	3,145	1,769	1,132	786	578	442	349	283
1.5”	8,386	4,717	2,096	1,179	755	524	385	295	233	189
2”	6,289	3,538	1,572	884	566	393	289	221	175	142
2.5”	5,031	2,830	1,258	708	453	314	231	177	140	113
3”	4,193	2,358	1,048	590	377	262	193	147	116	94
3.5”	3,594	2,022	898	505	323	225	165	126	100	81
4”	3,145	1,769	786	442	283	197	144	111	87	71
5”	2,516	1,415	629	354	226	157	116	88	70	57
6”	2,096	1,179	524	295	189	131	96	74	58	47
7”	1,797	1,011	449	253	162	112	83	63	50	40
8”	1,572	884	393	221	142	98	72	55	44	35

*These calculations are offered for reference and are calculated values based on previously recorded test data and represent a full workday 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. For technical or service assistance, contact Milwaukee Customer Service at 1-800-729-3878.