Wade Knight

From: Tony Wiseman
Sent: July-29-19 2:29 PM
To: Wade Knight
Subject: RE: PM1200 AIR FILTRATION SYSTEM

Importance: High

I had them look at the testing results and was advised they did not disagree with the results done by an independent testing company.

Regards,

Tony Wiseman
Woodworking Tech / Powermatic CNC Specialist
Toll Free 800-274-6846 X1345
Direct Ph. 615-793-1345
Fax 615-287-1559
Email _____

JPW INDUSTRIES
427 New Sanford Road, LaVergne, TN 37086

From: Tony Wiseman
Sent: July-25-19 10:43 AM
To: Wade Knight
Subject: RE: PM1200 AIR FILTRATION SYSTEM
Importance: High

I am sending that to engineering to get this confirmed. I will advise as soon as I get more feedback. It may be that it was a typo and the two filter ratings were inverted.

Regards,

Tony Wiseman
Woodworking Tech / Powermatic CNC Specialist
Toll Free 800-274-6846 X1345
Direct Ph. 615-793-1345
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Email - _____

JPW INDUSTRIES
427 New Sanford Road, LaVergne, TN 37086

From: Wade Knight
Sent: Wednesday, July 24, 2019 5:02 PM
To: Tony Wiseman
Subject: RE: PM1200 AIR FILTRATION SYSTEM

Hi Tom,

Regarding your notes of the MERV ratings of the outer and inner filter for the Air Filtration system AFS-1000B. the air cleaner on your website has the outer (99% of 5 micron dust particles) and the inner (85% of 1 micron du particles). You note that the outer has a MERV 12 and the inner MERV 11? Shouldn't the MERV of the inner filt than the outer filter? The higher the MERV rating the smaller particles captured… correct?

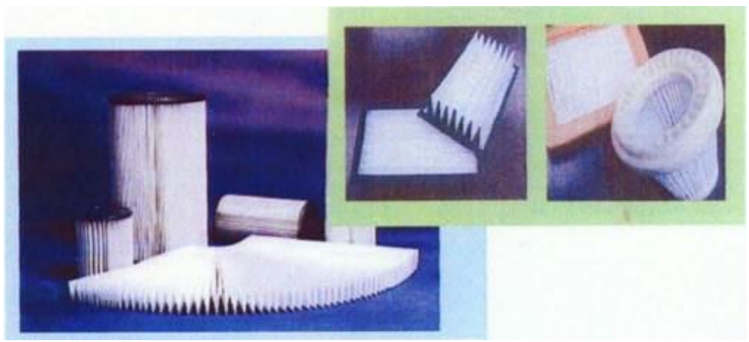
Wade

Wade Knight
Tel:
E-mail:

From: Tony Wiseman
To: wadeknight
Subject: PM1200 AIR FILTRATION SYSTEM

Tested the filter efficiency for 2 kind of type of filter apparatus then determined the their MERV

A. Pleats filter media (applied in filter cartridge with DC-1100C , DC-C ,etc…)



B. Bag filter (applied in Air Filtration system , AFS-1000B, AFS-500 ,etc…)
Outside filter (1st layer) + Inside filter (2nd layer)

&

The MERV for Canister filter (DC-C) is about : **13**
The MERV for Air Filtration system is about **12** (outside filter) and **11** (inside filter)
respectively.
The rating is derived from a test method developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), please find the enclosure 1(standard 52.2), this standard measures filter efficiency by how well the filter captures specific size.
As for the canister filter test report , please find the enclosure 2.

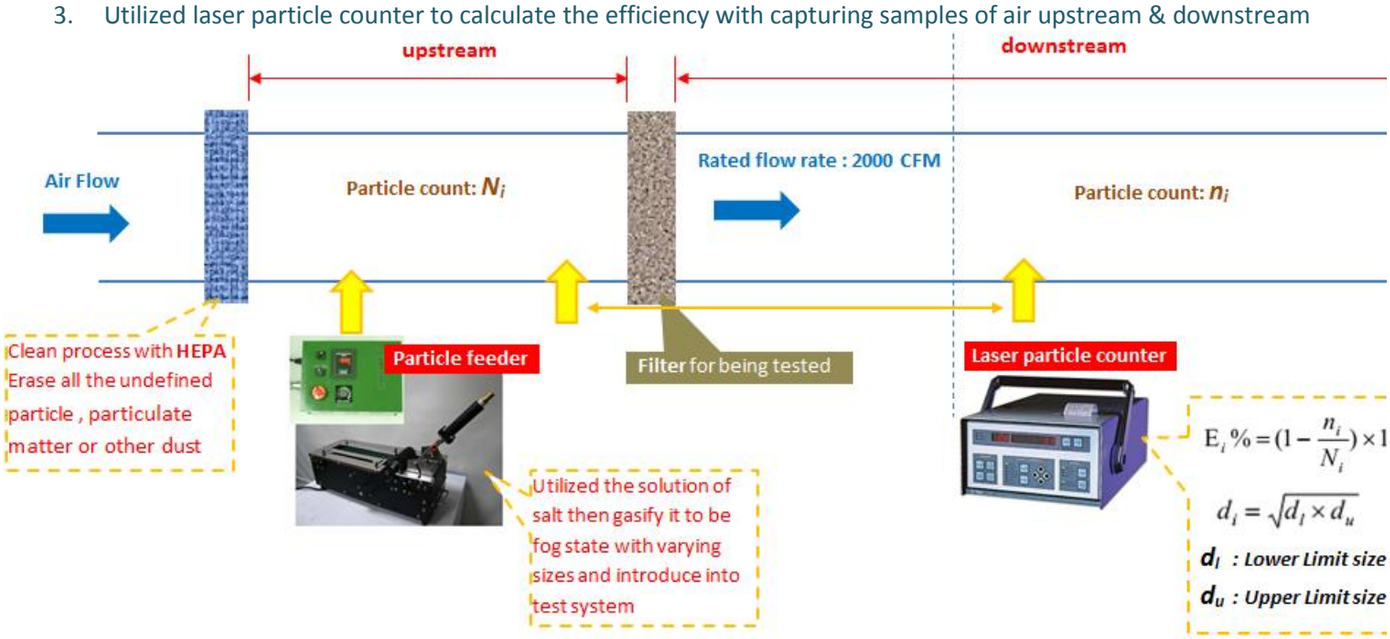
Here, I made a brief how to determine the MERV
1st : Define the range of particle characteristic size

Particle Counter(s) Size Range Boundaries (ASHRAE 52.2 Table 4-1)

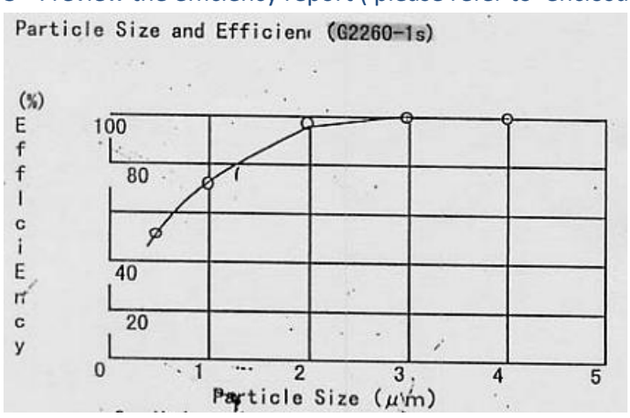
Range	Size Range		Geometric Mean Particle Size (μm)
	Lower Limit (μm)	Upper Limit (μm)	
1	0.30	0.40	0.35
2	0.40	0.55	0.47
3	0.55	0.70	0.62
4	0.70	1.00	0.84
5	1.00	1.30	1.14
6	1.30	1.60	1.44
7	1.60	2.20	1.88
8	2.20	3.00	2.57
9	3.00	4.00	3.46
10	4.00	5.50	4.69
11	5.50	7.00	6.20
12	7.00	10.00	8.37

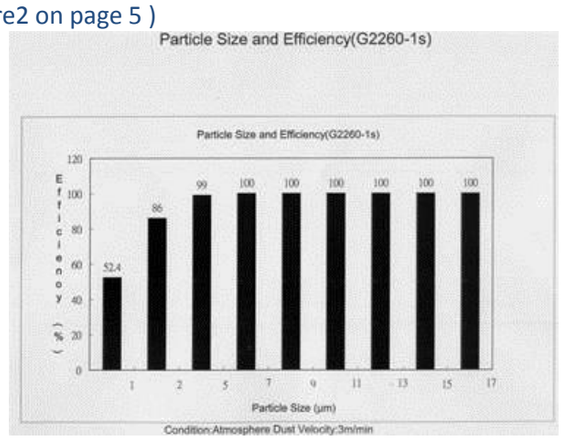
2nd : figure out the filter efficiency (survey as operation procedure as flowchart below)

1. Clear the air flow prior with HEPA (High-efficiency particulate air system)
2. Solid particle of varying sizes are introduced into test system
3. Utilized laser particle counter to calculate the efficiency with capturing samples of air upstream & downstream



3rd : review the efficiency report (please refer to enclosure2 on page 5)





4th: The lowest efficiency for each range is determine the Composite Minimum Efficiency. Once this efficiency is determined, the table below is used to determine the MERV

Please refer to enclosure 1/ table3

Minimum Efficiency Reporting Value (MERV) Parameters

Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency,% in Size Range, µm			Average Arrestance,%, by Standard 52.1 Method	Minimum Final Resistance	
	Range 1 0.30 - 1.0	Range 2 1.0 - 3.0	Range 3 3.0 - 10.0		Pa	in. of water
1	n/a	n/a	$E_3 < 20$	$A_{avg} < 65$	75	0.3
2	n/a	n/a	$E_3 < 20$	$65 \le A_{avg} < 70$	75	0.3
3	n/a	n/a	$E_3 < 20$	$70 \le A_{avg} < 75$	75	0.3
4	n/a	n/a	$E_3 < 20$	$75 \le A_{avg}$	75	0.3
5	n/a	n/a	$20 \le E_3 < 35$	n/a	150	0.6
6	n/a	n/a	$35 \le E_3 < 50$	n/a	150	0.6
7	n/a	n/a	$50 \le E_3 < 70$	n/a	150	0.6
8	n/a	n/a	$70 \le E_3$	n/a	150	0.6
9	n/a	$E_2 < 50$	$85 \le E_3$	n/a	250	1.0
10	n/a	$50 \le E_2 < 65$	$85 \le E_3$	n/a	250	1.0
11	n/a	$65 \le E_2 < 80$	$85 \le E_3$	n/a	250	1.0
12	n/a	$80 \le E_2$	$90 \le E_3$	n/a	250	1.0
13	$E_1 < 75$	$90 \le E_2$	$90 \le E_3$	n/a	350	1.4
14	$75 \le E_1 < 85$	$90 \le E_2$	$90 \le E_3$	n/a	350	1.4
15	$85 \le E_1 < 95$	$90 \le E_2$	$90 \le E_3$	n/a	350	1.4
16	$95 \le E_1$	$95 \le E_2$	$95 \le E_3$	n/a	350	1.4

NOTE: The minimum final resistance shall be at least twice the initial resistance, or as specified above, whichever is greater. Refer to 10.7.1.1.[45]

[45] The minimum final resistance specified is for test purposes to determine minimum efficiency, not as a recommendation for actual use. For example, air cleaners used in residences may be changed or cleaned at a lower final resistance than that required by this standard. Also see Appendix A3.1.

Regards,

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