

Ahlstrom Air media

Electrostat® HP

External Lab tests

Certification & testing

- **ASHRAE 52.2**
- **NIOSH N-95**
- **NIOSH N-99**
- **NIOSH R-95**
- **Bacterial Filtr. Efficiency (Nelson Laboratories)**
- **Virus Filtr. Efficiency (Nelson Laboratories)**

(Above certifications are available for some media only)

Temperature and Humidity conditioning of Electrostat® HP Media by LMS Technologies

Initial efficiency of flat sheet media was measured at rated velocity according to ASHRAE 52.2 standard's particle channel sizes.

Upon completion of efficiency measurement, the media was exposed to 99 degree Centigrade temperature plus 95% humidity for period of 4 hours.

The media was dried in ambient environment for at least 3 hours or until operator was assured that media was completely dry.

Secondary efficiency test on the conditioned sample was performed and as such, the effect of the conditioning step was measured.

Temperature and Humidity conditioning

HP 150	<i>Initial</i>	<i>Condition</i>
<i>Size Range (micron)</i>	<i>% Efficiency</i>	
<i>DP ("H₂O)</i>	<i>0.036</i>	<i>0.033</i>
<i>0.3-0.4</i>	<i>96.976</i>	<i>93.498</i>
<i>0.4-0.55</i>	<i>98.410</i>	<i>95.572</i>
<i>0.55-0.7</i>	<i>99.280</i>	<i>97.594</i>
<i>0.7-1.0</i>	<i>99.623</i>	<i>98.529</i>
<i>1.0-1.3</i>	<i>99.805</i>	<i>99.179</i>
<i>1.3-1.6</i>	<i>99.886</i>	<i>99.427</i>
<i>1.6-2.2</i>	<i>99.937</i>	<i>99.629</i>
<i>2.2-3.0</i>	<i>99.952</i>	<i>99.807</i>
<i>3.0-4.0</i>	<i>99.976</i>	<i>99.932</i>
<i>4.0-5.5</i>	<i>100.000</i>	<i>100.000</i>
<i>5.5-10.0</i>	<i>100.000</i>	<i>100.000</i>

HP 300	<i>Initial</i>	<i>Condition</i>
<i>Size Range (micron)</i>	<i>% Efficiency</i>	
<i>DP ("H₂O)</i>	<i>0.080</i>	<i>0.083</i>
<i>0.3-0.4</i>	<i>99.802</i>	<i>98.288</i>
<i>0.4-0.55</i>	<i>99.910</i>	<i>99.123</i>
<i>0.55-0.7</i>	<i>99.974</i>	<i>99.635</i>
<i>0.7-1.0</i>	<i>99.983</i>	<i>99.817</i>
<i>1.0-1.3</i>	<i>99.995</i>	<i>99.914</i>
<i>1.3-1.6</i>	<i>100.000</i>	<i>99.950</i>
<i>1.6-2.2</i>	<i>100.000</i>	<i>99.990</i>
<i>2.2-3.0</i>	<i>100.000</i>	<i>99.998</i>
<i>3.0-4.0</i>	<i>100.000</i>	<i>100.000</i>
<i>4.0-5.5</i>	<i>100.000</i>	<i>100.000</i>
<i>5.5-10.0</i>	<i>100.000</i>	<i>100.000</i>

NIOSH N-95 and N-99 TESTS

Ultrasonic Sample Evaluation #5 for N95, & N99 Filters (NaCl tested)

6-Jan-03

** All filters 3.218" diameter;
All tests done on 2.875" test plate

NIOSH	Flow Rate	Sample	Filter	Target Wgt	Disc Wgt	Resistance	Penetration	Penetration	Time
Type	(lpm)	Number	Materials	(grams)	(grams)	(initial)	(initial)	(peak)	(minutes)
N95	42.5	1	HP200/415 (SO)	1.569	1.313	9.10	0.419	1.300	9
	42.5	2	MB20/MB30/SB 34 (SO)	1.569	1.336	10.70	0.337	0.665	7
	42.5	3		1.569	1.277	10.50	0.350	0.759	8
	42.5	4		1.569	1.268	9.70	0.417	0.947	9
	42.5	5		1.569	1.258	8.50	0.460	1.710	10
N99	42.5	1	HP300/415 (SO)	2.094	2.084	13.30	0.051	0.082	9
	42.5	2	MB20/MB30/SB 34 (SO)	2.094	2.092	13.60	0.039	0.092	8
	42.5	3		2.094	2.079	12.00	0.067	0.179	10
	42.5	4		2.094	2.030	12.80	0.050	0.089	7
	42.5	5		2.094	2.061	11.10	0.061	0.183	10

NIOSH R-95

Ultrasonic Sample Evaluation #5 for R95 Filter (DOP tested)

January
10,2003

** All filters 3.218" diameter; All tests done on 2.875" test plate

Filter Material: HP750/415 no added scrim

Flow	Sample	Target Wgt	Filter Wgt	Material	Waxed Wgt	Waxed Wgt	Total Wgt	ΔP	Efficiency	Efficiency	Efficiency	Time**
(lpm)	Number	(grams)	(grams)	Wgt (gs m)	Before (g)	After (g)	Gain (mg)*	(initial)	(initial)	(100 m g)	(200 mg)	(min)
42.5	1	4.093	3.987	760.122	99.224	99.513	289	13.60	99.994	99.909	99.095	74
42.5	2	4.093	3.985	759.740	99.932	100.209	277	13.80	99.994	99.865	98.550	56
42.5	3	4.093	3.995	761.647	99.418	99.685	267	13.80	99.992	99.829	98.360	53

* Total weight gain for entire test until failure

** Total Time to failure

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LABORATORIES

Hollinee L.L.C
Lab Number 224853

Bacterial Filtration Efficiency & Differential Pressure
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TABLE 1. BFE Results
Test Date: 19 Dec 2002

SAMPLE IDENTIFICATION	CHALLENGE LEVEL (CFU)	TOTAL CFU RECOVERED	FILTRATION EFFICIENCY	DELTA P mm H ₂ O/ CM ²
HP 070/415 #1	6.9 x 10 ⁶	9.5 x 10 ³	99.9%	0.3
HP 070/415 #2	6.9 x 10 ⁶	1.1 x 10 ⁴	99.8%	0.3
HP 150/415 #1	6.9 x 10 ⁶	29	99.9996%	0.5
HP 150/415 #2	6.9 x 10 ⁶	11	99.9998%	0.5
HP 200/415 (2.25) #1	6.9 x 10 ⁶	2	99.99997%	0.7
HP 200/415 (2.25) #2	6.9 x 10 ⁶	2	99.99997%	0.6
HP 200/415 (3.0) #1	6.9 x 10 ⁶	1	99.99999%	0.8
HP 200/415 (3.0) #2	6.9 x 10 ⁶	0	>99.99999%	0.7
HP 350/415 (2.25) #1	6.9 x 10 ⁶	0	>99.99999%	1.5
HP 350/415 (2.25) #2	6.9 x 10 ⁶	0	>99.99999%	1.5

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LABORATORIES

Hollinee Filtration
Lab Number 224917

VFE at an Increased Challenge Level
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TABLE 1. VFE Results

SAMPLE IDENTIFICATION	CHALLENGE LEVEL (PFU)	TOTAL PFU RECOVERED	FILTRATION EFFICIENCY
HP045/415 #3	4.2×10^6	2.5×10^4	99.4%
HP045/415 #4	4.2×10^6	1.9×10^4	99.5%
HP070/415 #3	4.2×10^6	7.2×10^1	99.998%
HP070/415 #4	4.2×10^6	1.8×10^3	99.96%
HP150/415 #3	4.2×10^6	5.9×10^2	99.99%
HP150/415 #4	4.2×10^6	5.6×10^2	99.99%
HP200/415 (2.25) #3	4.2×10^6	1.4×10^2	99.997%
HP200/415 (2.25) #4	4.2×10^6	1.8×10^2	99.996%
HP200/415 (3.0) #3	4.2×10^6	1.3×10^2	99.997%
HP200/415 (3.0) #4	4.2×10^6	5.4×10^1	99.999%
HP 350/415 (2.25) #3	4.2×10^6	<1	>99.99998%
HP 350/415 (2.25) #4	4.2×10^6	<1	>99.99998%
HP 375/415 (3.0) #3	4.2×10^6	3.9×10^3	99.91%
HP 375/415 (3.0) #4	4.2×10^6	2.3×10^3	99.95%