

Confidential

Test Number: 19-339-4

ISO 16890-2 /-4:2016 Air Filter Test Result Summary

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For internal purpose only**Counter Information**

Manufacturer TSI Incorporated
 Model No. 3330
 Serial No. 3330115001

Information of Device Tested

Manufacturer Filtech Swiss
 Part Number NS8040 / NS8140
 Dimensions 12" X 12"
 Type of Media Flat Sheet Media
 Media Area 0.196 ft² / 0.02 m² Tested Area
 Construction NA
 Filter/Media Electrostatic
 Media Color White
 Media Adhesive NA
 Sample Procurement 5.1.2e

IPA Discharge Method

- ☒ Vapor Treated
☒ IPA Dip Method

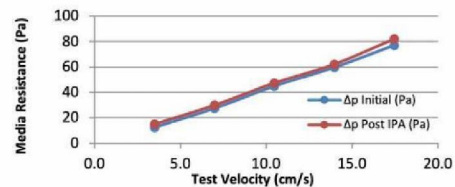
Test Flow Rate 5.40 CFM / 9.17 m³/h
 Test Media Velocity 27.5 FPM / 14.0 cm/s
 Test Aerosol Aerosolized KCl & DEHS
 Temperature 74.6 Deg F / 23.7 Deg C
 Relative Humidity 48.0 %
 Barometer 29.52 in Hg / 99.97 kPa

ISO 16890-2,-4 Media Rating by Size

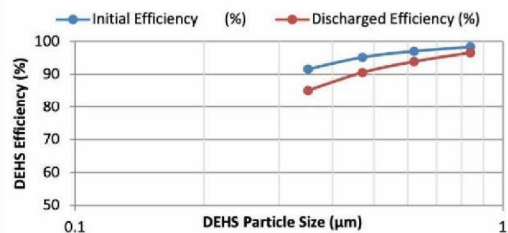
Reporting Data	ePM ₁	ePM _{2.5}	ePM ₁₀
Minimum	91%	94%	98%
Average	93%	95%	99%
Reported	90%	95%	95%

Resistance vs. Air Flow

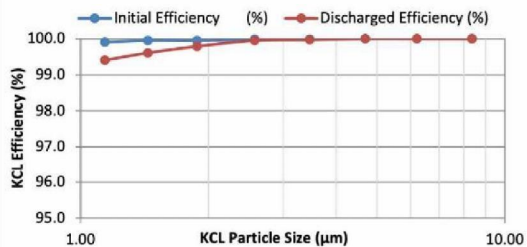
%	cm/s	ft/min	Δp Initial (Pa)	Δp Post IPA (Pa)
25	3.5	6.9	12.4	14.9
50	7.0	13.8	27.4	29.9
75	10.5	20.6	44.8	47.3
100	14.0	27.5	59.7	62.2
125	17.5	34.4	77.1	82.1

**Pre / Post Efficiency by Particle Size****DEHS**

Range (μm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test	
				Pre	Post
0.3-0.4	0.35	92 ±0.79	85 ±0.92	334276	122831
0.4-0.55	0.47	95 ±0.53	91 ±0.50	318878	113656
0.55-0.7	0.62	97 ±0.45	94 ±0.63	196216	69559
0.7-1.0	0.84	98 ±0.20	97 ±0.17	249512	89435

**KCL**

Range (μm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test	
				Pre	Post
1.0-1.3	1.14	100 ±0.04	99 ±0.11	28545	27752
1.3-1.6	1.44	100 ±0.02	100 ±0.07	19988	20292
1.6-2.0	1.88	100 ±0.02	100 ±0.06	49577	50085
2.0-3.0	2.57	100 ±0.02	100 ±0.04	32843	34157
3.0-4.0	3.46	100 ±0.04	100 ±0.03	18379	19040
4.0-5.5	4.69	100 ±0.00	100 ±0.00	13340	12654
5.5-7.0	6.20	100 ±0.00	100 ±0.00	5553	4614
7.0-10.0	8.37	100 ±0.00	100 ±0.00	6258	3923



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Data Entry Table							Reporting Data			
DEHS								ePM ₁	ePM _{2.5}	ePM ₁₀
d_i	d_{i-1}	d_m	$\Delta \ln d_i$	E_i	$E_{D,i}$	$E_{A,i}$	Minimum	91%	94%	--
0.30	0.40	0.35	0.29	91.6%	85.2%	88.4%	Average	93%	95%	99%
0.40	0.55	0.47	0.32	95.2%	90.6%	92.9%	Reported	90%	95%	95%
0.55	0.70	0.62	0.24	97.0%	93.9%	95.5%				
0.70	1.00	0.84	0.36	98.3%	96.6%	97.5%				
KCL										
1.00	1.30	1.14	0.26	99.9%	99.4%	99.7%				
1.30	1.60	1.44	0.21	99.9%	99.6%	99.8%				
1.60	2.20	1.88	0.32	99.9%	99.8%	99.9%				
2.20	3.00	2.57	0.31	100.0%	99.9%	100.0%				
3.00	4.00	3.46	0.29	100.0%	100.0%	100.0%				
4.00	5.50	4.69	0.32	100.0%	100.0%	100.0%				
5.50	7.00	6.20	0.24	100.0%	100.0%	100.0%				
7.00	10.00	8.37	0.36	100.0%	100.0%	100.0%				
ePM ₁ Calculations										
d_i	d_{i-1}	d_m	$\Delta \ln d_i$	$E_{A,i}$	$q_{3\sigma}$	$q_{3\sigma} \cdot \Delta \ln d_i$	$E_{D,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{A,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{m,1}(PM_1)$	$E(PM_1)$
0.30	0.40	0.35	0.29	88.4%	22.627%	0.065095	0.055454	0.057550	91%	93%
0.40	0.55	0.47	0.32	92.9%	19.891%	0.063343	0.057401	0.058860		
0.55	0.70	0.62	0.24	95.5%	15.837%	0.038193	0.035871	0.036466		
0.70	1.00	0.84	0.36	97.5%	11.522%	0.041097	0.035702	0.040059		
Sums:							0.188428	0.192935		
ePM _{2.5} Calculations										
d_i	d_{i-1}	d_m	$\Delta \ln d_i$	$E_{A,i}$	$q_{3\sigma}$	$q_{3\sigma} \cdot \Delta \ln d_i$	$E_{D,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{A,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{m,2.5}(PM_{2.5})$	$E(PM_{2.5})$
0.30	0.40	0.35	0.29	88.4%	22.627%	0.065095	0.055454	0.057550	94%	95%
0.40	0.55	0.47	0.32	92.9%	19.891%	0.063343	0.057401	0.058860		
0.55	0.70	0.62	0.24	95.5%	15.837%	0.038193	0.035871	0.036466		
0.70	1.00	0.84	0.36	97.5%	11.522%	0.041097	0.035702	0.040059		
1.00	1.30	1.14	0.26	99.7%	8.503%	0.022309	0.022176	0.022232		
1.30	1.60	1.44	0.21	99.8%	7.618%	0.015817	0.015755	0.015782		
1.60	2.20	1.88	0.32	99.9%	8.022%	0.025546	0.025492	0.025512		
2.20	3.00	2.57	0.31	100.0%	9.984%	0.030966	0.030960	0.030966		
Sums:							0.282801	0.287417		
ePM ₁₀ Calculations										
d_i	d_{i-1}	d_m	$\Delta \ln d_i$	$E_{A,i}$	$q_{3\sigma}$	$q_{3\sigma} \cdot \Delta \ln d_i$	$E_{D,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{A,i} \cdot q_{3\sigma} \cdot \Delta \ln d_i$	$E_{m,10}(PM_{10})$	$E(PM_{10})$
0.30	0.40	0.35	0.29	88.4%	9.412%	0.027077	0.023066	0.023939	98%	99%
0.40	0.55	0.47	0.32	92.9%	8.395%	0.026733	0.024225	0.024941		
0.55	0.70	0.62	0.24	95.5%	7.432%	0.017924	0.016834	0.017113		
0.70	1.00	0.84	0.36	97.5%	7.014%	0.025016	0.024167	0.024384		
1.00	1.30	1.14	0.26	99.7%	7.628%	0.020013	0.015894	0.019944		
1.30	1.60	1.44	0.21	99.8%	8.833%	0.018340	0.018268	0.018299		
1.60	2.20	1.88	0.32	99.9%	10.804%	0.034408	0.034334	0.034361		
2.20	3.00	2.57	0.31	100.0%	13.726%	0.042573	0.042551	0.042569		
3.00	4.00	3.46	0.29	100.0%	16.708%	0.048067	0.048054	0.048057		
4.00	5.50	4.69	0.32	100.0%	19.542%	0.062233	0.062233	0.062233		
5.50	7.00	6.20	0.24	100.0%	21.671%	0.052261	0.052261	0.052261		
7.00	10.00	8.37	0.36	100.0%	23.143%	0.082545	0.082545	0.082545		
Sums:							0.448432	0.450536		

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