Blue Heaven Technologies

2820 S. English Station Road - Louisville, KY 40299

TEST NO. 21-187-3

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

Counter Information

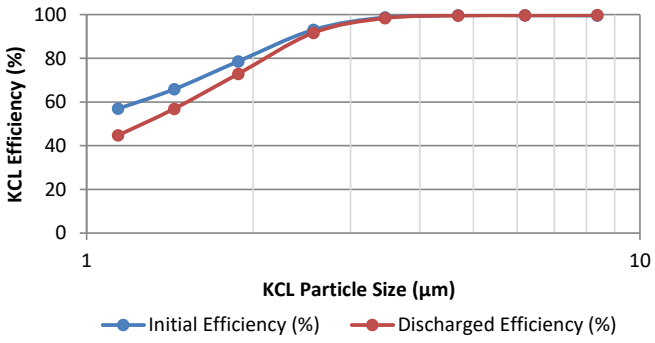
Manufacturer	TSI, Inc.
Model No.	3330
Serial No.	3330174305
IPA Discharge Method	☑ Vapor Treated ☐ IPA Dip Method

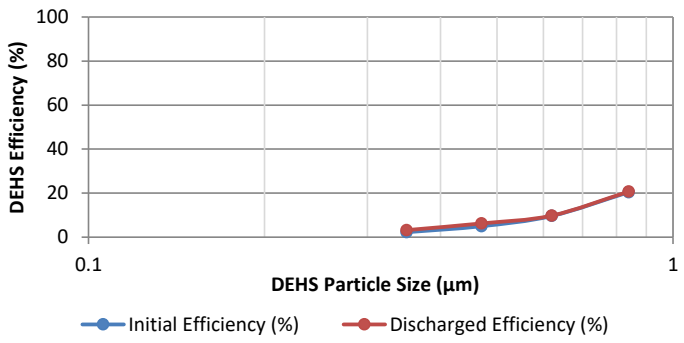
Test Conditions

Test Flow Rate	10.4 CFM / 17.72 m3/h
Test Aerosol	Aerosolized KCl & DEHS
Temperature	69.0 Deg F / 20.6 Deg C
Relative Humidity	36.6 %
Barometer	29.31 in Hg / 99.26 kPa

Device Tested

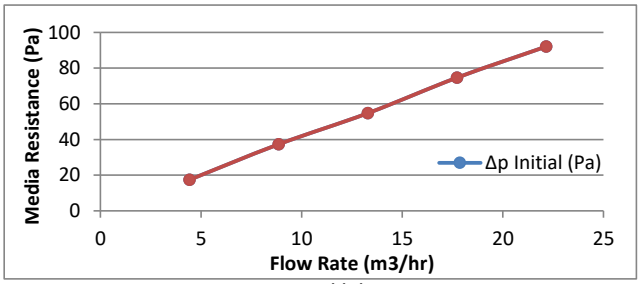
Manufacturer	JP Air Tech
Model	JX260
Dimensions	16" x 16"
Type of Media	Flat Sheet Media
Media Area	1.0 ft2 / 0.09 m2 Tested Area
Construction	N/A
Filter/Media Electrostatic Charge	N/A
Media Color	White
Media Adhesive	NA
Sample Procurement	JP Air Tech





KCL

Range (µm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test Pre	Post
1.0-1.3	1.14	57	45	69732	101079
1.3-1.6	1.44	66	57	41794	60383
1.6-2.0	1.88	79	73	106058	151300
2.0-3.0	2.57	93	92	69613	102483
3.0-4.0	3.46	99	98	35769	54608
4.0-5.5	4.69	100	100	18780	30951
5.5-7.0	6.20	100	100	4507	8099
7.0-10.0	8.37	100	100	2263	4653



%	m^3/h	Δp Initial (Pa)	Δp Post IPA (Pa)
25	4.43	17.4	17.4
50	8.86	37.3	37.3
75	13.29	54.7	54.7
100	17.72	74.6	74.6
125	22.15	92.1	92.1

DEHS

Range (µm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test Pre	Post
0.3-0.4	0.35	2	3	487370	496749
0.4-0.55	0.47	5	6	458343	465836
0.55-0.7	0.62	10	10	290959	293061
0.7-1.0	0.84	20	21	433348	426748

Reporting Data

	ePM_1	$ePM_{2.5}$	ePM_{10}
Minimum	9%	28%	74%
Average	8%	29%	74%
Reported	N/A*	N/A*	70%

Requestor Information

Test Requestor	Cagri Tekman	Phone:	+90 532 686 9259
Company Name	JP Air Tech	Email:	ct@jpairtech.com
Company Address	Skifervej 2, 4990 Sakskobing, Denmark	Requested Date:	

Test Operator Information — Test Performed By: Evan Sparks, Approved by — Completion Date: 4/16/2021

ISO 16890-1

Data Entry Table

DEHS

d_i	d_{i+1}	d_m	$\Delta\ln d_i$	E_i	$E_{D,i}$	$E_{A,i}$
0.30	0.40	0.35	0.29	2.2%	3.2%	2.7%
0.40	0.55	0.47	0.32	5.0%	6.2%	5.6%
0.55	0.70	0.62	0.24	9.6%	9.8%	9.7%
0.70	1.00	0.84	0.36	20.4%	20.7%	20.6%

KCL

d_i	d_{i+1}	d_m	$\Delta\ln d_i$	E_i	$E_{D,i}$	$E_{A,i}$
1.00	1.30	1.14	0.26	56.9%	44.8%	50.9%
1.30	1.60	1.44	0.21	65.8%	56.9%	61.4%
1.60	2.20	1.88	0.32	78.6%	72.9%	75.8%
2.20	3.00	2.57	0.31	93.0%	91.7%	92.3%
3.00	4.00	3.46	0.29	98.7%	98.4%	98.5%
4.00	5.50	4.69	0.32	99.6%	99.6%	99.6%
5.50	7.00	6.20	0.24	99.7%	99.6%	99.7%
7.00	10.00	8.37	0.36	99.5%	99.8%	99.7%

Reporting Data

	ePM_1	$ePM_{2,5}$	ePM_{10}
Minimum	9%	28%	--
Average	8%	29%	74%
Reported	N/A*	N/A*	70%

* Any Reporting value of N/A shows the minimum efficiency is below 50% for that ePM value

ePM_1 Calculations

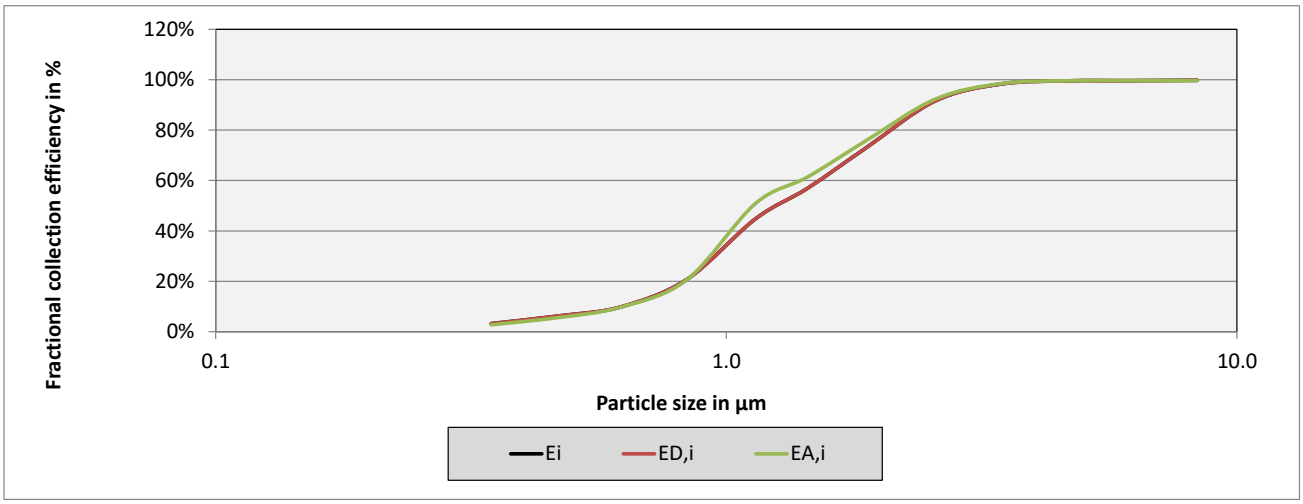
d_i	d_{i+1}	d_m	$\Delta\ln d_i$	$E_{A,i}$	q_{3u}	$q_{3u}*\Delta\ln d_i$	$E_{D,i}*q_{3u}*\Delta\ln d_i$	$E_{A,i}*q_{3u}*\Delta\ln d_i$	$E_{min}(PM_1)$	$E(PM_1)$
0.30	0.40	0.35	0.29	2.7%	22.627%	0.065095	0.002084	0.001772		
0.40	0.55	0.47	0.32	5.6%	19.891%	0.063343	0.003951	0.003550		
0.55	0.70	0.62	0.24	9.7%	15.837%	0.038193	0.003742	0.003707		
0.70	1.00	0.84	0.36	20.6%	11.522%	0.041097	0.008512	0.008453	9%	8%
					Sums:	0.207728	0.018290	0.017483		

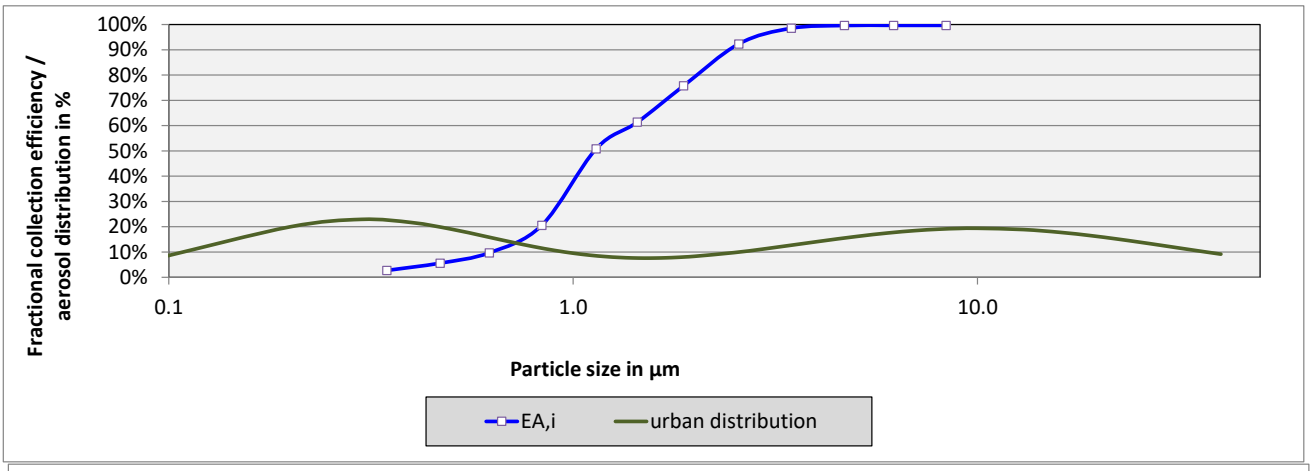
$ePM_{2,5}$ Calculations

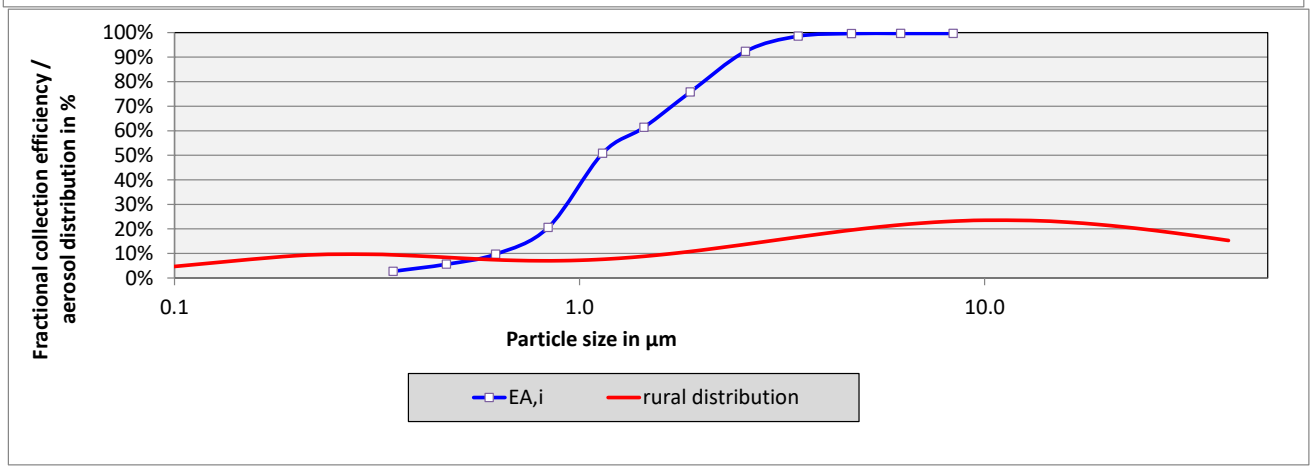
d_i	d_{i+1}	d_m	$\Delta\ln d_i$	$E_{A,i}$	q_{3u}	$q_{3u}*\Delta\ln d_i$	$E_{D,i}*q_{3u}*\Delta\ln d_i$	$E_{A,i}*q_{3u}*\Delta\ln d_i$	$E_{min}(PM_{2,5})$	$E(PM_{2,5})$
0.30	0.40	0.35	0.29	2.7%	22.627%	0.065095	0.002084	0.001772		
0.40	0.55	0.47	0.32	5.6%	19.891%	0.063343	0.003951	0.003550		
0.55	0.70	0.62	0.24	9.7%	15.837%	0.038193	0.003742	0.003707		
0.70	1.00	0.84	0.36	20.6%	11.522%	0.041097	0.008512	0.008453		
1.00	1.30	1.14	0.26	50.9%	8.503%	0.022309	0.009985	0.011345	28%	29%
1.30	1.60	1.44	0.21	61.4%	7.618%	0.015817	0.009002	0.009709		
1.60	2.20	1.88	0.32	75.8%	8.022%	0.025546	0.018622	0.019354		
2.20	3.00	2.57	0.31	92.3%	9.984%	0.030966	0.028383	0.028594		
					Sums:	0.302366	0.084283	0.086484		

ePM_{10} Calculations

d_i	d_{i+1}	d_m	$\Delta\ln d_i$	$E_{A,i}$	q_{3r}	$q_{3r}*\Delta\ln d_i$	$E_{D,i}*q_{3u}*\Delta\ln d_i$	$E_{A,i}*q_{3r}*\Delta\ln d_i$	$Emin(PM_{10})$	$E(PM_{10})$
0.30	0.40	0.35	0.29	2.7%	9.412%	0.027077	0.000867	0.000737		
0.40	0.55	0.47	0.32	5.6%	8.395%	0.026733	0.001668	0.001498		
0.55	0.70	0.62	0.24	9.7%	7.432%	0.017924	0.001756	0.001740		
0.70	1.00	0.84	0.36	20.6%	7.014%	0.025016	0.005182	0.005146		
1.00	1.30	1.14	0.26	50.9%	7.628%	0.020013	0.008958	0.010177		
1.30	1.60	1.44	0.21	61.4%	8.833%	0.018340	0.010438	0.011257		
1.60	2.20	1.88	0.32	75.8%	10.804%	0.034406	0.025082	0.026067		
2.20	3.00	2.57	0.31	92.3%	13.726%	0.042573	0.039022	0.039312	74%	74%
3.00	4.00	3.46	0.29	98.5%	16.708%	0.048067	0.047275	0.047357		
4.00	5.50	4.69	0.32	99.6%	19.542%	0.062233	0.061964	0.061989		
5.50	7.00	6.20	0.24	99.7%	21.671%	0.052261	0.052075	0.052082		
7.00	10.00	8.37	0.36	99.7%	23.143%	0.082545	0.082371	0.082270		
					Sums:	0.457189	0.336657	0.339631		


Fractional collection efficiency in %
120%
100%
80%
60%
40%
20%
0%
0.1
1.0
10.0
Particle size in µm
Ei
ED,i
EA,i


Fractional collection efficiency / aerosol distribution in %
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.1
1.0
10.0
Particle size in µm
EA,i
urban distribution


Fractional collection efficiency / aerosol distribution in %
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.1
1.0
10.0
Particle size in µm
EA,i
rural distribution