Blue Heaven Technologies

2820 S. English Station Road - Louisville, KY 40299

TEST NO. 21-297-3

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

Counter Information

Manufacturer	TSI, Inc.
Model No.	3330
Serial No.	3330174305

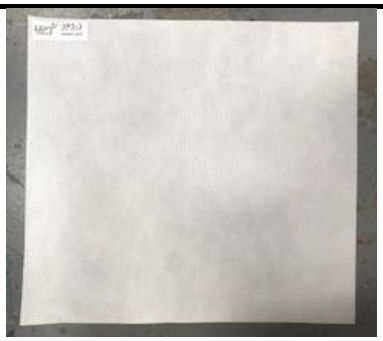
IPA Discharge Method: ☑ Vapor Treated ☐ IPA Dip Method

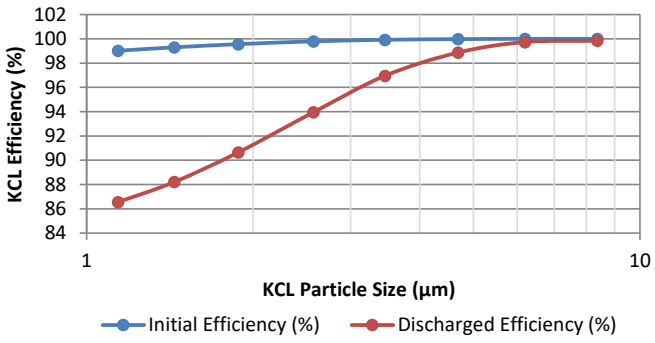
Test Conditions

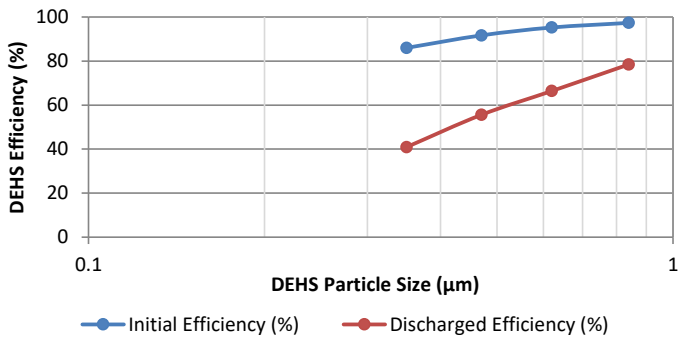
Test Flow Rate	10.5 CFM / 17.84 m3/h
Test Aerosol	Aerosolized KCl & DEHS
Temperature	82.0 Deg F / 27.8 Deg C
Relative Humidity	45.0 %
Barometer	29.66 in Hg / 100.44 kPa

Device Tested

Manufacturer	UFT Can Inc.
Model	STC-13-9-F
Dimensions	16" x 16"
Type of Media	Flat Sheet Media
Media Area	1.0 ft^2
Construction	N/A
Filter/Media Electrostatic Charge	N/A
Media Color	White
Media Adhesive	N/A
Sample Procurement	UFT Can Inc.

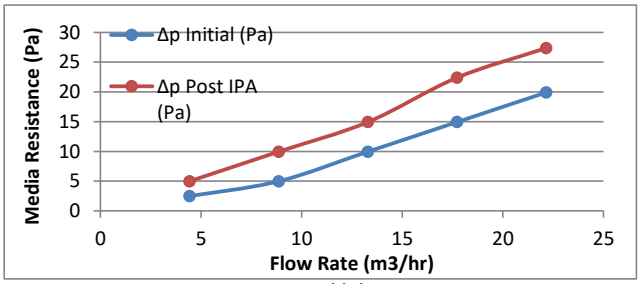






KCL

Range (µm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test Pre	Post
1.0-1.3	1.14	99	87	111972	26751
1.3-1.6	1.44	99	88	67937	15902
1.6-2.0	1.88	100	91	164849	36216
2.0-3.0	2.57	100	94	102575	20644
3.0-4.0	3.46	100	97	50537	10184
4.0-5.5	4.69	100	99	24889	5508
5.5-7.0	6.20	100	100	6189	1495
7.0-10.0	8.37	100	100	4355	1072



%	m^3/h	Δp Initial (Pa)	Δp Post IPA (Pa)
25	4.43	2.5	5.0
50	8.86	5.0	10.0
75	13.29	10.0	14.9
100	17.72	14.9	22.4
125	22.15	19.9	27.4

DEHS

Range (µm)	Geo. Mean	Initial Efficiency (%)	Discharged Efficiency (%)	Upstream Number of Particles per Test Pre	Post
0.3-0.4	0.35	86	41	151769	672694
0.4-0.55	0.47	92	56	140835	669498
0.55-0.7	0.62	95	66	96025	462122
0.7-1.0	0.84	97	78	144648	782046

Reporting Data

	ePM_1	$ePM_{2.5}$	ePM_{10}
Minimum	57%	68%	89%
Average	75%	81%	93%
Reported	75%	80%	90%

Requestor Information

Test Requestor	Angela Henley	Phone:	519-512-2457
Company Name	UFT Can Inc.	Email:	angela.henley@uftcan.com
Company Address	Worthington Drive Unit 2 Brantford, ON N3SOH	Requested Date:	

Test Operator Information — Test Performed By: EWS — Approved by — Completion Date: 5/24/2021

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	86.0%	40.9%	63.4%
0.40	0.55	0.47	0.32	91.7%	55.6%	73.6%
0.55	0.70	0.62	0.24	95.2%	66.4%	80.8%
0.70	1.00	0.84	0.36	97.3%	78.4%	87.9%

KCL

1.00	1.30	1.14	0.26	99.0%	86.6%	92.8%
1.30	1.60	1.44	0.21	99.3%	88.2%	93.8%
1.60	2.20	1.88	0.32	99.6%	90.7%	95.1%
2.20	3.00	2.57	0.31	99.8%	94.0%	96.9%
3.00	4.00	3.46	0.29	99.9%	97.0%	98.4%
4.00	5.50	4.69	0.32	100.0%	98.9%	99.4%
5.50	7.00	6.20	0.24	100.0%	99.7%	99.9%
7.00	10.00	8.37	0.36	100.0%	99.8%	99.9%

Reporting Data

	ePM_1	$ePM_{2,5}$	ePM_{10}
Minimum	57%	68%	--
Average	75%	81%	93%
Reported	75%	80%	90%

ePM_1 Calculations

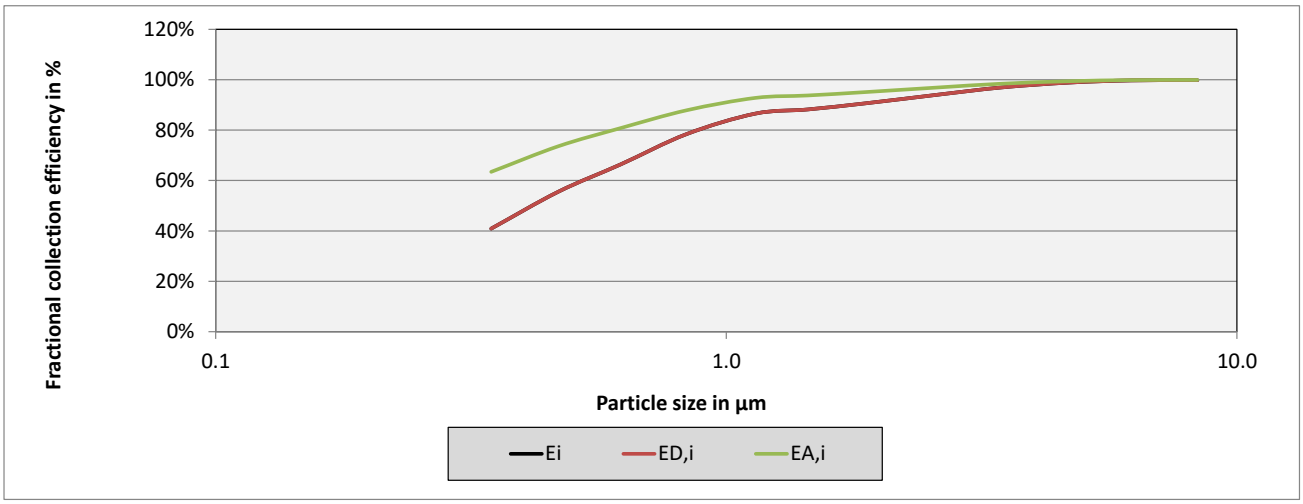
d_i	d_{i+1}	d_m	$\Delta\ln d_i$	$E_{A,i}$	q_{3u}	$q_{3u}*\Delta\ln d_i$	$E_{D,i}*q_{3u}*\Delta\ln d_i$	$E_{A,i}*q_{3u}*\Delta\ln d_i$	$E_{min}(PM_1)$	$E(PM_1)$
0.30	0.40	0.35	0.29	63.4%	22.627%	0.065095	0.026628	0.041297	57%	75%
0.40	0.55	0.47	0.32	73.6%	19.891%	0.063343	0.035197	0.046629		
0.55	0.70	0.62	0.24	80.8%	15.837%	0.038193	0.025346	0.030858		
0.70	1.00	0.84	0.36	87.9%	11.522%	0.041097	0.032240	0.036121		
					Sums:	0.207728	0.119412	0.154905		

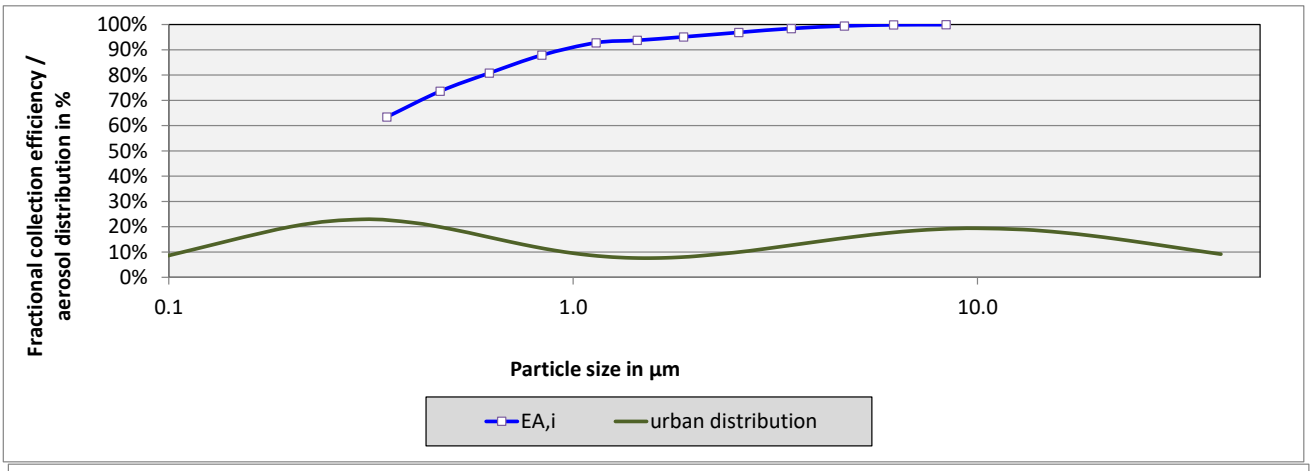
$ePM_{2,5}$ Calculations

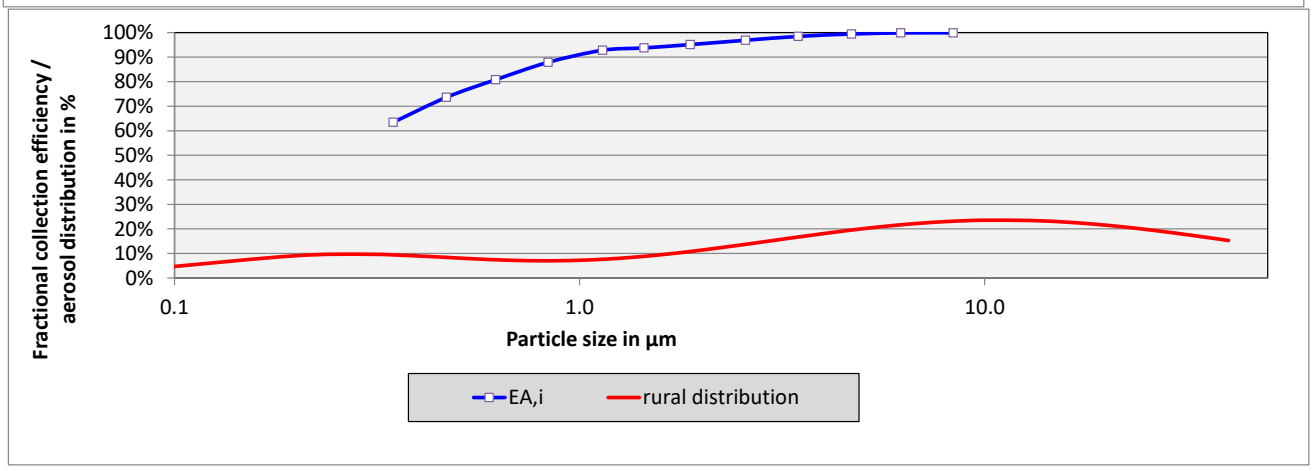
d_i	d_{i+1}	d_m	$\Delta\ln d_i$	$E_{A,i}$	q_{3u}	$q_{3u}*\Delta\ln d_i$	$E_{D,i}*q_{3u}*\Delta\ln d_i$	$E_{A,i}*q_{3u}*\Delta\ln d_i$	$E_{min}(PM_{2,5})$	$E(PM_{2,5})$
0.30	0.40	0.35	0.29	63.4%	22.627%	0.065095	0.026628	0.041297	68%	81%
0.40	0.55	0.47	0.32	73.6%	19.891%	0.063343	0.035197	0.046629		
0.55	0.70	0.62	0.24	80.8%	15.837%	0.038193	0.025346	0.030858		
0.70	1.00	0.84	0.36	87.9%	11.522%	0.041097	0.032240	0.036121		
1.00	1.30	1.14	0.26	92.8%	8.503%	0.022309	0.019311	0.020701		
1.30	1.60	1.44	0.21	93.8%	7.618%	0.015817	0.013952	0.014829		
1.60	2.20	1.88	0.32	95.1%	8.022%	0.025546	0.023158	0.024296		
2.20	3.00	2.57	0.31	96.9%	9.984%	0.030966	0.029094	0.029998		
					Sums:	0.302366	0.204927	0.244730		

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	63.4%	9.412%	0.027077	0.011076	0.017178	89%	93%
0.40	0.55	0.47	0.32	73.6%	8.395%	0.026733	0.014854	0.019679		
0.55	0.70	0.62	0.24	80.8%	7.432%	0.017924	0.011895	0.014482		
0.70	1.00	0.84	0.36	87.9%	7.014%	0.025016	0.019625	0.021987		
1.00	1.30	1.14	0.26	92.8%	7.628%	0.020013	0.017324	0.018571		
1.30	1.60	1.44	0.21	93.8%	8.833%	0.018340	0.016177	0.017194		
1.60	2.20	1.88	0.32	95.1%	10.804%	0.034406	0.031191	0.032724		
2.20	3.00	2.57	0.31	96.9%	13.726%	0.042573	0.039999	0.041242		
3.00	4.00	3.46	0.29	98.4%	16.708%	0.048067	0.046604	0.047317		
4.00	5.50	4.69	0.32	99.4%	19.542%	0.062233	0.061532	0.061877		
5.50	7.00	6.20	0.24	99.9%	21.671%	0.052261	0.052123	0.052192		
7.00	10.00	8.37	0.36	99.9%	23.143%	0.082545	0.082415	0.082480		
					Sums:	0.457189	0.404816	0.426922		


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