REPORT

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Pullman Ermator AB
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Filtration efficiency test of filter media

(2 appendices)

A test of filter media regarding initial efficiency was carried out by request from Pullman Ermator AB.

Tested Items

Two samples of filter media, Pullman Ermator AB product number: 42720004, dimension 350 mm x 350 mm.

Filter bag TH2C, Pullman Ermator AB product number: 4228001 is made of this filter media.

The items were send to SP by Pullman Ermator AB and were received by SP on December 9, 2011.

Date and place

The test was carried out at SP's laboratory of Energy Technology in Borås, Sweden on December 14, 2011.

Test method

The filter media was tested in a flat sheet filter media test rig with a square of 300 mm x 300 mm at an airflow of 16,2 l/s. An aerosol generator produced a test aerosol (DEHS) which was brought through a neutralizer and then mixed with HEPA-filtered air upstream the filter media. The initial efficiency was determined by measuring the particle concentration upstream and downstream of the filter media. An optical particle counter (0.1-3 µm) was used and measured the particle concentration alternately between upstream and downstream by an auto sampler. Before entering the particle counter, the aerosol was diluted upstream 100 times.

Two samples of filter media was tested, result is presented for each sample and as an average result.

Results

The results are presented in appendix 1 and are valid only for the items tested.

Test conditions

Atmospheric Pressure:	968 mbar
Temperature:	22.7 – 23,1 °C
Relative Humidity:	27,1 – 27,8 %

Measurement equipment

Pressure gauge Furness FC016,	SP's inventory no. 202 587
Pressure gauge Furness FC016,	SP's inventory no. 202 588
Pressure gauge Furness FC012,	SP's inventory no. 201 691
Pressure gauge Furness FC012,	SP's inventory no. 201 690
Particle counter Las-X II,	SP's inventory no. 701 378
Auto sampler,	SP's inventory no. 201 455
Barometer, Druck DPI 260,	SP's inventory no. 201 637
Temperature and RH, Testo 635,	SP's inventory no. 900 065
Flow meter, MFS-C50,	SP's inventory no. 202 190
Kr-85 Aerosol Neutralizer, TSI,	SP's inventory no. 202 635
Diluter, PALAS VKL-10	SP's inventory no. 201 713
Diluter, PALAS VKL-10	SP's inventory no. 202 714

Uncertainty of measurement

The uncertainty of the air flow is better than ± 3 %
The uncertainty of the pressure drop is better than ± 3 %
The uncertainty of the temperature is better than ± 0.5 °C
The uncertainty of the relative humidity is better than ± 3 % RH
The uncertainty of the atmospheric pressure is better than ± 1 mbar

The uncertainty of the measured efficiencies is reported on a 95 % confidence level.

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Appendices
1. Test results
2. Picture of tested items

Appendix 1

Initial efficiency and pressure drop

Test no: SP201112141
Test aerosol: DEHS
Tested item: Filter media, Product number: 42720004
Air flow rate: 16.2 l/s
Media velocity: 0.175 m/s
Size of material sample: 924 cm²

Particle size µm		Sample 1	Sample 2	Average
		Initial efficiency %		
Interval	Mean	Pressure drop 1211 Pa	1182 Pa	1197 Pa
0.10 - 0.12	0.11	99.984 ± 0.005	99.970 ± 0.002	99.977
0.12 - 0.15	0.13	99.986 ± 0.002	99.979 ± 0.003	99.982
0.15 - 0.20	0.17	99.987 ± 0.001	99.983 ± 0.002	99.985
0.20 - 0.25	0.22	99.989 ± 0.001	99.985 ± 0.002	99.987
0.25 - 0.35	0.30	99.991 ± 0.002	99.991 ± 0.002	99.991
0.35 - 0.45	0.40	99.993 ± 0.001	99.995 ± 0.001	99.994
0.45 - 0.60	0.52	99.996 ± 0.001	99.998 ± 0.001	99.997
0.60 - 0.75	0.67	99.997 ± 0.001	99.999 ± 0.001	99.998
0.75 - 1.00	0.87	99.999 ± 0.001	100.000 ± 0.000	99.999
1.00 - 1.50	1.22	99.998 ± 0.002	100.000 ± 0.000	99.999
1.50 - 2.00	1.73	99.999 ± 0.003	100.000 ± 0.001	99.999
2.00 - 3.00	2.45	100.000 ± 0.000	100.000 ± 0.000	100.000
NOTE	The uncertainty of the measured efficiencies is reported on a 95 % confidence level.			

Comment: The results indicates that this filter media has a filtration efficiency corresponding filter class H13. (H13: MPPS ≥ 99,95%)

Appendix 2