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Filter & Aerosol Technologie GmbH

Mainleus, July 8th , 2013

TEST REPORT JPA 130701
PARTICLE COLLECTION EFFICIENCY AND PRESSURE DROP OF FLAT SHEET FILTER MEDIA FOLLOWING EN 1822

1. SCOPE AND TEST BENCH SET-UP

One flat sheet media had to be tested for pressure drop at the nominal flow rate and for particle collection efficiency following EN 1822:2009. The test is based on the test procedure below. The test set-up complies with the DIN standard 71460 Part 1 'Air filters for motor vehicle compartments'.

General Information:

a)	Test requested by:	JP Air Tech
b)	Manufacturer:	JP Air Tech
c)	Test specimen / Construction:	Flat Sheet Media
d)	Model/Parts ID:	JX180NANO- IPA VAPOR TREATED
e)	Date of manufacturing:	N/A
f)	Upstream side:	labeled
g)	Printing:	DUST SIDE 180 Nano
h)	Dimensions:	Sample: Ø 190 mm
i)		Sample $_{effective}$: Ø 150 mm
j)	Sample was received on:	July 1st , 2013.
k)	Test has been performed on:	July 4th, 2013.

Test Conditions:

Air Flow:	50 m³/m²/h
Temperature:	23°C ± 3°C
Relative Humidity:	50% ±3%
Test Aerosol:	pure DEHS
Efficiency Particle Size Range:	0.04 – 0.5µm (geometric - SMPS)
Particle Counter:	SMPS (Scanning Mobility Particle Sizer); TSI

Table 1: Test Procedure

No.	Test Filter-No.: JPA 130701-	FW1
P1	Filter Weight	X
P2	Media IPA Vapor treated for 24 h	X
P3	Efficiency; 0.04 – 0.5 µm; SMPS; 50 m³/m²/h	x

The accuracy of the flow controls is 2% of the nominal flow or better. The pressure drop transducers have ranges 0 – 100, 0 – 500 and 0 – 3000 Pa. Their accuracy is 1% of the maximum of the range.

For the DEHS particle size range of 0.04 – 0.5 µm a SMPS (Scanning Mobility Particle Sizer, TSI Inc.) was used as detector.
The DEHS aerosol was generated using an ATM 220 atomizer (Topas GmbH). The test method complies with EN 1822.

2. RESULTS AND ANALYSIS

2.1 DEHS Efficiency

The test method is described in EN 1822. All numeric efficiency data are shown in the tables of page 1 of the attachments.
The fractional filter efficiency graphs were derived from a total of six measurements of particle size distributions. Three measurements were taken upstream and three were taken downstream of the filter. The figures and the tables in the attachments show the averaged values of the three efficiency measurements as well as the total scattering range for each size channel.

2.2 Results

The detailed results are shown in the attachment 1.

Heinz Bittermann
(Managing Director)

i.A. Hanna Michel
(Laboratory Manager)

Attachments
Attachment 1: Summary of Test Results of Sample JPA 130701_FW1

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Attachment 1 to Test Report JPA 130701

Summary of Test Reults for Sample
Flat Sheet Media JX180NANO
fiatec-No.: JPA 130701_FW1

1. Fractional Collection Efficiency

Particle Counter: SMPS		
Test Aerosol: reines DEHS		
Flow Velocity: 50 m³/m²/h		
	IPA Vapor treated	
Particle Sizee (geometric)	η_{mean} *	Δ_{max} **
[µm]	[%]	[%]
0,029	90,1	2,7
0,034	85,9	2,2
0,039	82,8	2,0
0,045	79,3	3,4
0,052	76,9	3,1
0,060	75,2	3,0
0,070	73,0	2,6
0,081	70,4	0,6
0,093	68,7	0,9
0,107	67,0	0,5
0,124	66,2	0,5
0,143	66,5	0,4
0,165	67,2	1,0
0,191	67,9	0,6
0,221	68,9	1,1
0,255	69,6	1,1
0,294	70,9	1,0
0,340	72,3	1,1
0,392	73,8	0,8
0,453	75,1	1,2
0,523	76,6	0,7
MPPS [%]	66,2	
Filterclass following EN1822	-	

* η_{mean} is the average particle collection calculated from three sets of up- and downstream measurements
** Δ_{max} represents the full scattering range of single values for each size channel

2. Pressure Drop

Flow Velocity	[m³/m²/h]	0	50
$\Delta p_{Fixture}$	[Pa]	0	0
$\Delta p_{total\ New\ Filter}$	[Pa]	0	14
$\Delta p_{New\ Filter}$	**[Pa]**	**0**	**14**

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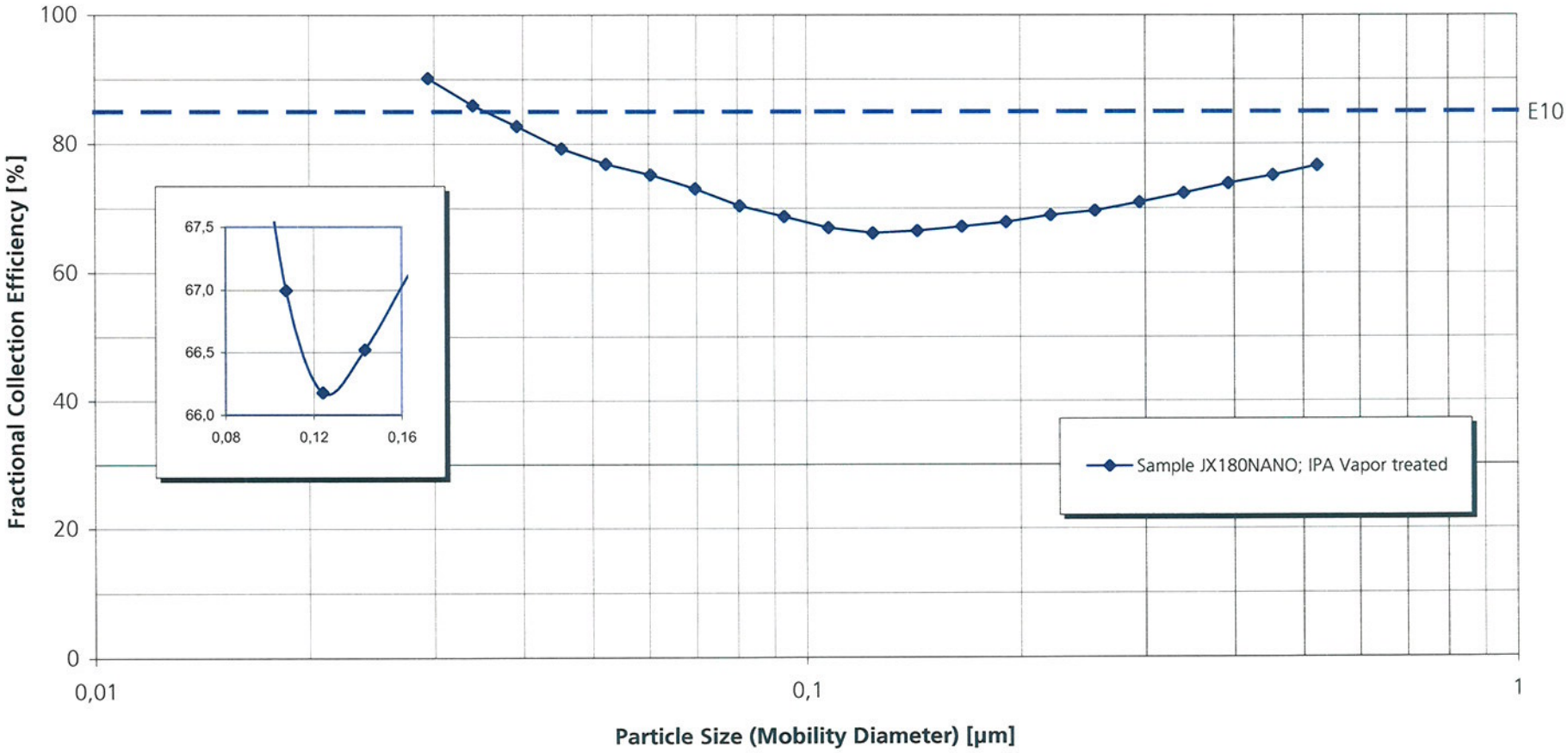
Attachment 1 to Test Report JPA 130701
Diagram: Fractional Collection Efficiency

Fractional Collection Efficiency



Customer:	JP Air Tech	Test-Instrument:	Scanning Mobility Particle Sizer
Muster:	Flat Sheet JX180NANO	Test Aerosol:	pure DEHS
Datum:	04.07.2013	Flow Velocity:	**50 m³/m²/h**
fiatec-Nr:	JPA 130701_FW1	Pressure Drop:	14Pa