



# EFFICIENCY TEST ON FLAT SHEET MEDIA

TEST REPORT ATT 190903

Mainleus, October 7<sup>th</sup>, 2019

Efficiency tests based on EN779:2012

Initiated by:

**Acik Kart Bilgi Teknolojileri Ticaret A.S. HYFIBER**

## 1. Objectives and Test Set-up

On flat sheet media samples had to be tested for their particle separating efficiency bases on the procedure described in EN 779:2012 and the parameters shown in this report.

- |                           |  |
|---------------------------|--|
| a) Test requested by:     | Acik Kart Bilgi Teknolojileri Ticaret A.S. HYFIBER |
| b) Test specimen:         | Flat sheet media                                   |
| c) Model / Parts ID:      | HF-B115-FR-09                                      |
| d) Date of manufacturing: | not known  |
| e) Dimensions:            | ø 190 mm, effective ø 150 mm                       |
| f) Samples received on:   | September 20 <sup>th</sup> , 2019                  |
| g) Test performed on:     | September 30 <sup>th</sup> , 2019                  |

Table 1: Test Procedure

No.	fiatec-No.:	ATT 190903-	<b>FW1</b>
1	Filter weight		x
2	Initial efficiency OPC 0,3 – 10 µm, DEHS		x

### Test conditions

Flow velocity:	5,3 cm/s
Temperature:	23 ± 2°C
Relative humidity:	50 ± 3%
Particle counter:	Abakus (Klotz)

For determination of fractional efficiencies in the particle size range of 0,3 – 10µm (optical) an optical particle counter Abakus (Klotz) was used as detector.

The DEHS aerosol was generated by an atomizer UGF 2000 (Palas GmbH). The test aerosol was not electro-statically neutralized.

The accuracy of the airflow control is 2% of the nominal value.


Pressure drops were measured using three sensors of the ranges 0 - 100, 0 – 1000 and 0 - 10000 Pa. The accuracy of the pressure transducers is 1% of the range maximum.

## 2. Results

The fractional efficiency graphs were derived from a total of six measurements. 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.

Table 2: Results of **new device** efficiencies FW1.1 to FW1.3

Particle size (optical) [µm]	FW 1.1 [%]	FW 1.2 [%]	FW 1.3 [%]	<b>Average Efficiency</b>
0,3	82,8	83,8	82,6	<b>83,1</b>
0,4	87,7	88,8	87,6	<b>88,0</b>
0,6	92,7	93,6	92,6	<b>93,0</b>
0,8	94,2	95,4	94,5	<b>94,7</b>
1,0	95,5	96,0	95,3	<b>95,6</b>



Matthias Eber  
 (Managing Director)



i.A. Vanessa Grampp  
 (Lab Technician)

Attachments  
 ATT 190901-FW1

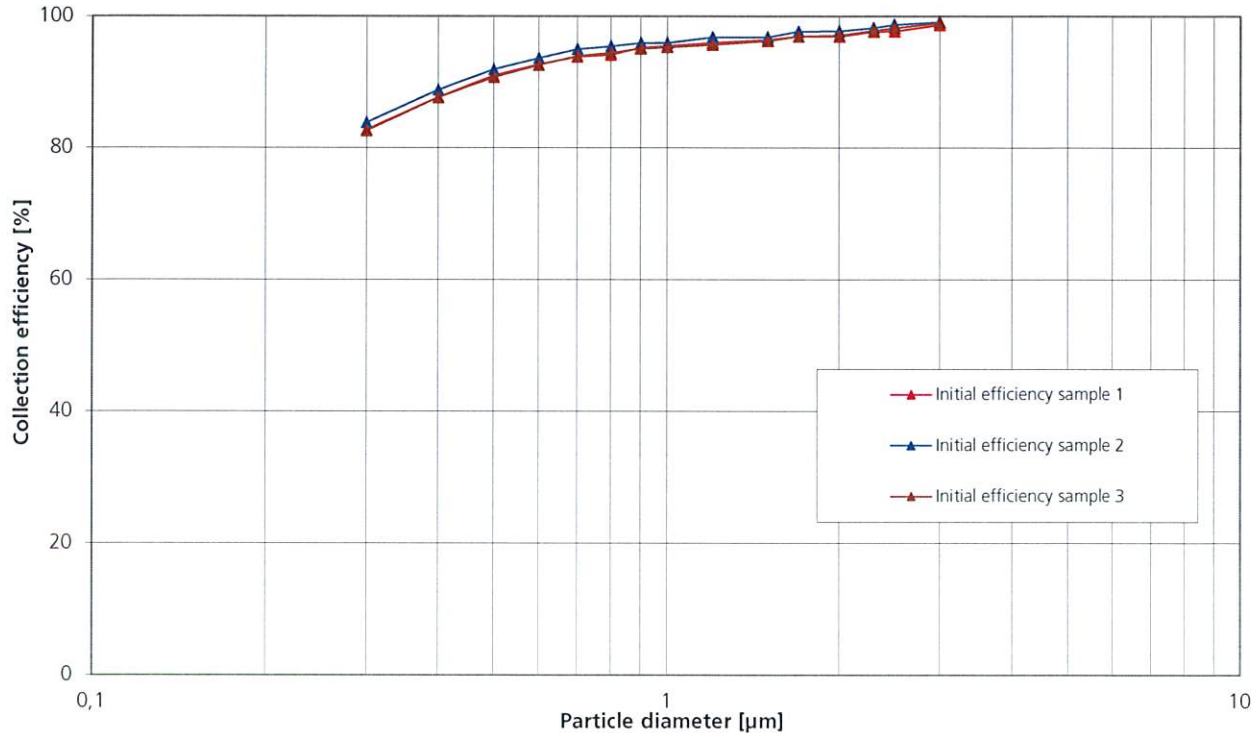
**CHAPTER 11/ DISCHARGED EFFICIENCIES**

Testing organisation: fiatec Filter & Aerosol Technologie GmbH

Report No.: ATT 190903

Sample no.:	FW1	Date of test:	30.09.2019	Test mode:	based on EN 779:2012, Chapter 11
Test area:[m²]	0,0177	Eff. Aerosol:	DEHS (pure)	Neutralisation method:	
Air velocity [m/s]:	0,053 (100 %)	Media:	HF-B115-FR-09	not discharging	
Model / filter - ID:	Flat sheet media				

**Fractional collection efficiency before and after media discharge**



Pressure drop [Pa]	New untreated media							Discharged media							
	49		48		48		48	Sample 1		Sample 2		Sample 3		Average	
	Sample 1	Sample 2	Sample 3	Average	Sample 1	Sample 2	Sample 3	Average	Sample 1	Sample 2	Sample 3	Average			
Particle size (optical) [µm]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}$ [%]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}^*$ [%]	$\Delta_{max}^{**}$ [%]	$\eta_{mean}$ [%]	
0,3	82,8	0,4	83,8	0,1	82,6	0,7	<b>83,1</b>								
0,4	87,7	0,4	88,8	0,4	87,6	0,3	<b>88,0</b>								
0,5	91,0	0,6	91,9	0,0	90,7	0,1	<b>91,2</b>								
0,6	92,7	0,9	93,6	0,2	92,6	0,5	<b>93,0</b>								
0,7	93,9	1,0	95,0	0,8	94,0	0,1	<b>94,3</b>								
0,8	94,2	0,7	95,4	0,5	94,5	0,5	<b>94,7</b>								
0,9	95,2	0,9	95,9	0,8	95,1	0,4	<b>95,4</b>								
1,0	95,5	0,7	96,0	0,9	95,3	0,4	<b>95,6</b>								
1,2	96,0	0,6	96,8	0,7	95,7	0,1	<b>96,2</b>								
1,5	96,4	0,5	96,8	0,6	96,3	0,2	<b>96,5</b>								
1,7	96,9	0,7	97,7	0,2	96,9	0,6	<b>97,2</b>								
2,0	96,9	1,2	97,7	0,9	97,1	1,0	<b>97,3</b>								
2,3	97,7	0,3	98,2	1,4	97,8	0,9	<b>97,9</b>								
2,5	97,7	0,2	98,7	0,5	98,2	0,2	<b>98,2</b>								
3,0	98,7	0,6	99,1	0,2	99,0	0,2	<b>98,9</b>								

\*  $\eta_{mean}$  is the average efficiency at a certain loading phase calculated from six single concentration measurements up- and downstream of the filter.

\*\*  $\Delta_{max}$  represents the absolute range of the values measured for each size channel.