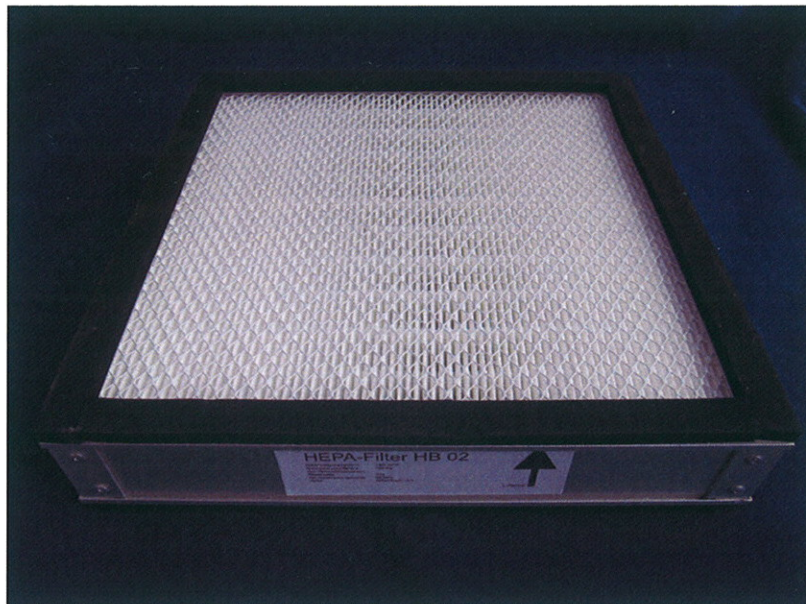


PERFORMANCE TEST OF HEPA PANELFILTER

HEPA-FILTER HB02
305 x 305 x 50 [mm]
Glass Fibre Media
Grade E12 (3,8 cm/s)



Test Report Number: ATR 140201-P1
07/03/2014

according to EN1822-5:2009

Initiated by:

ALLEGRA Trocknungstechnik Vertriebs GmbH

Requested by: ALLEGRA Trocknungstechnik Vertriebs GmbH
An der Industriebahn 12-16
13088 Berlin
Germany

Order: Mr. Andre Thomas

1. Subject: Performance test of Panel filter according to EN 1822-5:2009.
2. Test specimen: Panel filter 305 x 305 x 68 [mm] with metal frame.
 - 2.1. Model/Parts ID: HEPA-Filter HB02,
 - 2.2. Serial- or Batch Number: not indicated
 - 2.3. Date of manufacturing: not indicated
 - 2.4. Upstream side: acc. airflow arrow
 - 2.5. Printing: see picture
 - 2.6. Dimensions: 305 x 305 x 50 (65 incl. sealing) [mm]
 - 2.7. Nominal Air flow: 180 m³/h

 - 2.8. Samples were received on February 26th, 2014.
 - 2.9. Test has been performed on March 06th, 2014.
3. Test method: Test has been performed according to the procedures as defined in EN1822-5:2009 "High Efficiency Air Filters (EPA, HEPA, ULPA) – Part 5: Determining the efficiency of filter elements. A leakage test was not performed.
4. Variations from the test standard: N/A
5. Refer to data summary for details of instrumentation.
6. General Remarks: The present test report consists of 6 pages and must only be published in full wording. Publication of parts of this report is only permissible with written authorisation from fiatec GmbH experts.
7. Results: See test report for detailed information.
The findings are summarized on page 4.
 - 7.1. According the classification requirements described in EN 1822-1 the filter element complies with the grade E12 at a nominal air flow of 180 m³/h / media velocity of 3,8 cm/s
 - 7.2. The results apply to the tested specimen only. Filtration performance under certain application conditions cannot necessarily be predicted from these data.

7.3. The net effective filtering area ca. 1,31 m² was calculated using the following measured approximate dimensions:

Effective width of pleats: 270 mm
Number of pleats: 70
Pleat height: 35 mm

Friday, March 07th, 2014



Steffan Trnetschek
(Managing Director)

Air Filter Test Report according to EN1822-5:2009
Report Number: ATR 140201-P1
Data Summary
GENERAL

Testing Organisation:	fiatec-Filter&Aerosol Technologie GmbH			Supervisor:	Steffan Trnetschek
Test sample no.:	ATR 140201	Date of test:	06/03/14	Samples received:	26/02/2014
Test requested by:	ALLEGRA Trocknungstechnik Vertriebs GmbH			Lab Technican:	Barbara Michel
Samples submitted by:	ALLEGRA Trocknungstechnik Vertriebs GmbH				

DETAILS OF TEST SAMPLES

Model:	HEPA-Filter HB02	Manufacturer:	not indicated	Filter state:	New
Construction:	Pleated Panel Filter With Metal Frame	Net effective filtering area [m ²]: ca.	1.31	Number Of Samples:	1
Sample Dimensions [mm]:	ca. 305 x 305 x 65 (inc. sealing, frame 50 mm)	Type of media:	fibreglass paper	Serial Number / LOT Number	not indicated

TEST PARAMETERS
TEST INSTRUMENTATION

Media Velocity:	[cm/s]	3.8	Aerosol:	DEHS (pure), polydisperse
Temperature:	[°C]	23	Sampling probe	fixed
Rel. Humidity:	[%]	50	Sampling diameter / sample flow	2 mm / 0.4 l/min
Ambient Pressure:	[mbar]	990	Particle Generator:	Atomizer ATM 220 (Topas GmbH)
Pressure at Sample Loc.	[Pa]	0	Particle Detector (same for conc. up/down)	SMPS (TSI Inc.)
Airflow:	[m ³ /h]	180	Neutralizer:	same for concentration up/down
Mounting Orientation Filter		vertical	Dilution System:	N/A
Mean Diam. Test Aerosol	[nm]	215	Pressure Transducer (Range)	N/A
Geom. standard deviation (Aerosol)		1.62		0-500 Pa

TEST RESULTS

Mean Differential Pressure Drop [Pa]	At Start of Test	At End of Test	Filter Grade:	E12
	197	202		
MPPS [µm]	0.17	MPPS [µm] Discharged (if applicable)	Not Applicable	
Mean Eff. at MPPS [%]	99.89	Mean Eff. at MPPS [%] Discharged	Not Applicable	
Mean E _{95%} at MPPS [%]	99.88	Mean E _{95%} at MPPS [%] Discharged	Not Applicable	

07/03/2014

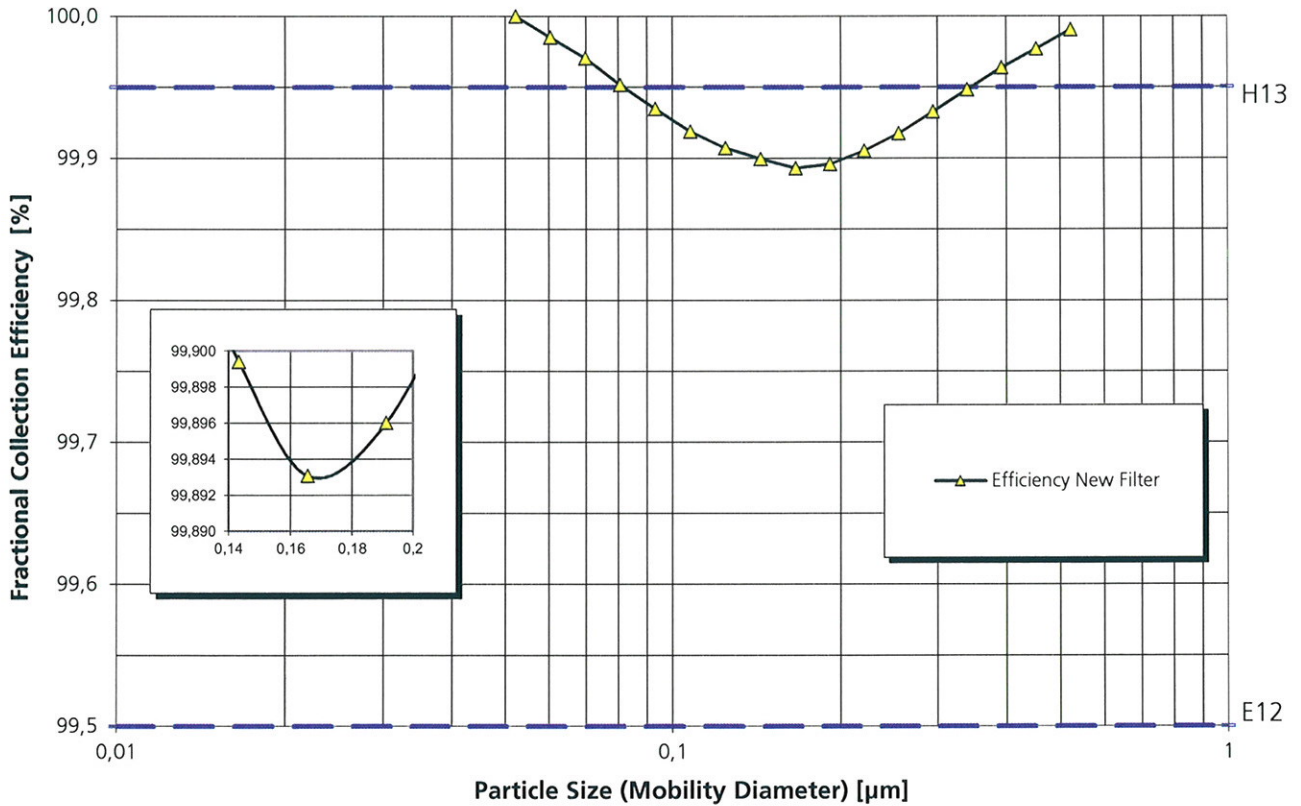
Date



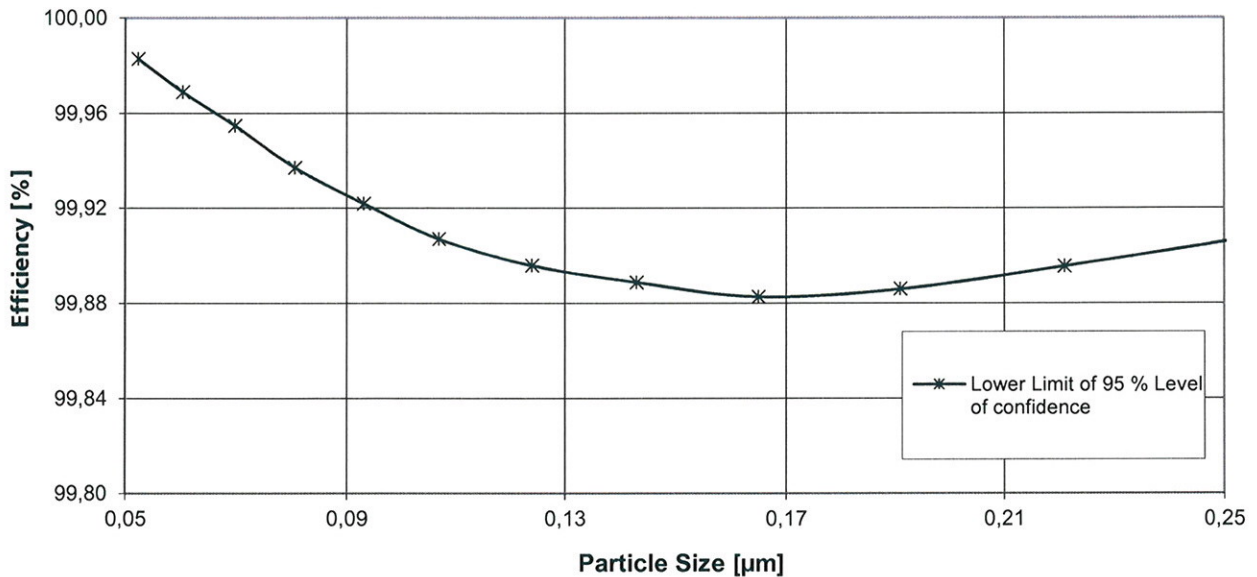
 i. A. Barbara Michel
 Laboratory Technican

Air Filter Test Report according to EN1822-5:2009
Report Number: ATR 140201-P1

Particle Collection Efficiency New Filter



Mean Efficiency as lower limit value for the 95% confidence level



Air Filter Test Report according to EN1822-5:2009
Report Number: ATR 140201-P1

Data Tables

Table 1: Pressure Drop

Airflow [m³/h]	Media Velocity [cm/s]	Δp at Start of Test [Pa]
0	0	0
180	3.8	5

Table 2: Efficiencies and Lower Limit of 95%-Level of Confidence

Particle Size [μm]	\bar{E} [%]	$\bar{E}_{95\%}$ [%]
0.0523	100.000	99.983
0.0604	99.985	99.969
0.0698	99.971	99.955
0.0806	99.952	99.937
0.0931	99.935	99.922
0.1075	99.919	99.907
0.1241	99.907	99.896
0.1433	99.899	99.889
0.1655	99.893	99.883
0.1911	99.896	99.886
0.2207	99.905	99.896
0.2548	99.917	99.908
0.2943	99.933	99.923
0.3398	99.948	99.939
0.3924	99.964	99.954
0.4532	99.977	99.967
0.5233	99.991	99.981