Test Report

about

Determination of the Fractional Efficiency of a

Filter Media for Nose Filters

APS2 00 154 17

Essen, 09/25/2017
DMT GmbH & Co. KG

(Renschen)   (Dorn)

DMT

Order:	Determination of the Fractional Efficiency of a Filter Media for Nose Filters

Client:	LEM S.r.l
	Streda de Pareda, 54
	I-38032 Canazei (TN)

Contact person at Client's:	Mr. Talmon Emilio

Contact person at DMT's:	Dr. Renschen
	Mr. Schamberg
	Mr. Glätzer

DMT Order No.:	206 73 543

DMT-Test-Report No.:	APS2 00 154 17

1. Task

Task was to examine the fractional separation efficiency of a filter media for nose filters. The examined filter media was a flat material. The filter media has the designation "SBPP50CR" from the manufacturer KEMITEX s.r.l, Italy. Samples of this media were send to the laboratory directly from the manufacturer.

With regard to a realistic test of the filter media test conditions were based on the tidal volume in the idle state of an adult of 8 l/min. For the nasal opening a total cross section of 1.5 cm² was assumed. Based on these parameters an air velocity through the nose of about 90 cm/s was calculated.

The filter media was placed flat in a specially designed filter media holder for flat filter materials onto a support grid and clamped air tight in the boundary zone. The determination was carried out in the DMT test rig according to DIN 71460, de-signed for testing of automotive cabin air filters for environmental aerosols, such as road dust and pollen. According to the examination of such filters, the test dust concentration was chosen so that the area-based concentration is comparable. From this a raw gas dust concentration of about 15 mg/m³ was calculated. The test dust according to DIN 71460, a mineral dust "A4 SAE coarse" was used. The dust was dispersed in the channel of the test rig by means of a rotating brush dust generator. The determination of the particle concentration in the air was done by means of an aerosol spectrometer in the relevant particle size range between 0.3 to 17 microns. At the raw and clean gas side air was sucked at an isokinetic sampling flow rate and supplied to the aerosol spectrometer. The initial fractional filtration efficiency of filter media in new conditions was determined three times.

2. Test results

The results are documented in the tabular report on pages 4 and 5.

3. Summary

The examined filter media shall be used for nose filters. Main purposes is to keep pollens out of the respiratory system. A lot of people are reacting with allergic symptoms on pollens which they breathe. Therefore, the nose filter shall prevent the uptake of pollens in the respiratory system. In the literature it is well documented that most pollens are in a size range between 10 to 100 µm. Most pollens are in a range between 25 to 50 µm (e.g. Paul A. Baron & Klaus Willeke "Aerosol Measurement: Principles, Techniques, and Applications", John Wiley & Sons, November 2005, page 755).

As can be seen from the fractional efficiency curve the efficiency of the filter media even at an air velocity of 90 cm/s is better than 90 % of particles ≥ 10 µm (pollens).

DMT GmbH & Co. KG

(Dr. Renschen)

DMT

Test report   ▲ DMT

1. General information

Testing laboratory:	Laboratory for Air Hygiene DMT GmbH & Co. KG, Am Technologiepark 1, D-45307 Essen, Germany
Test:	Determination of the Fractional Efficiency of a Filter Media for Nose Filters
Test report No.:	APS 2 00 154 17

2. Order information

Topic:	Fractional Efficiency Determination of a Filter Media
Order no.:	206 73 543-10
Order date:	2017-08-16
Customer:	LEM S.r.l
Contact persons at customer side:	Emilio Talmon

3. Test Data

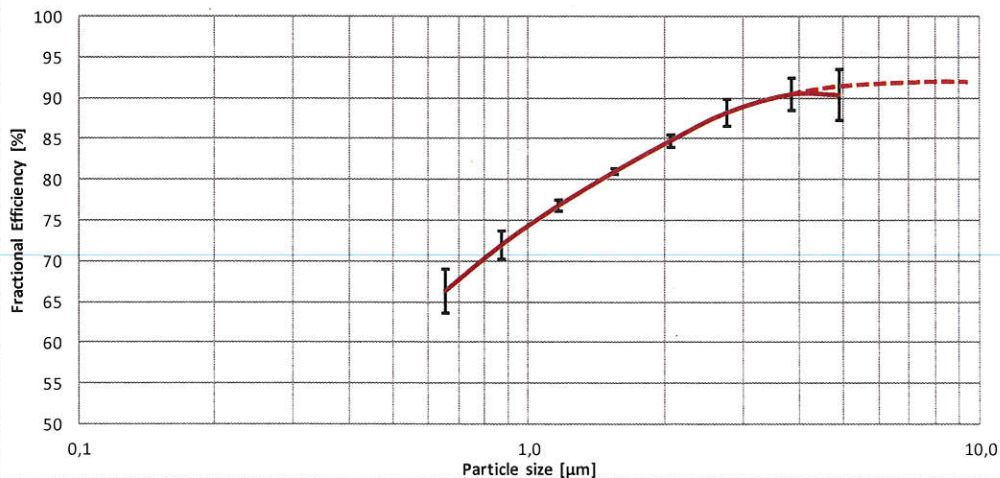|			
Filter type:	Filter Media for Nose Filters	Filter media dimensions (L x W):	0,25 m x 0,37 m
Manufacturer:	KEMITEX s.r.l	Number of pleats:	none
Designation of filter media:	SBPP50CR 50 g/m²	Filter area:	0,0925 m²
Batch:	k.A.	Filter weight new:	not determined

4. Task of Determination

1. Determination of the fractional efficiency of a flat filter media at an air velocity of 90 cm/s and the according pressure drop

5. Results

5.1 Determination of the fractional efficiency

Test data:

Relative humidity :	53,3 %	**Remark:**
Temperature:	19,7 °C	Due to a quite low-concentration of test dust only
Ambient pressure:	1009 hPa	relatively few particles were in a range > 5 microns.
Air flow:	304,1 m³/h	Therefore, a statistical uncertainty results from the
Filter flow rate:	90 cm/s	poor counter events on the clean gas side for the
Test dust:	SAE A4 Coarse	particle size range >5 microns and thus in the
Dust Concentration	17,9 mg/m³	calculation of separation efficiency. The trend is
Corona off/on	off	shown for higher particle separation as scattered
No. of repeated measurements:	3	line.

Initial Fractional Efficiency of the Filter Media

DMT

5.2 Pressure drop increase during the testing

Pressure drop difference at the beginning:	110	Pa
Pressure drop difference at the end:	146	Pa
Dust capacity: Δp-Increase	36	Pa

6. Testing Equipment

Gerät	Bezeichnung	Fabrikat
Partikelzähler	Welas 1000	Palas
Partikeldipergierer	RBG 2000	Palas
Volumenstrommessgerät	Einlaufdüse 70 mm	Westenberg
Druckmessgerät (E-D)	Schrägrohr	Birkholz
Druckmessgerät (Δp$_{Filter}$)	ManoAir 500	Schildknecht
Klima	GFTB 200	GHM Messtechnik

7. Date and Signature

Executive person:	H. Glätzer	Responsible person:	Dr. D. Renschen
Testing date:	2017-09-22	Reporting date:	2017-09-26

2017-09-25
Date

Signatures