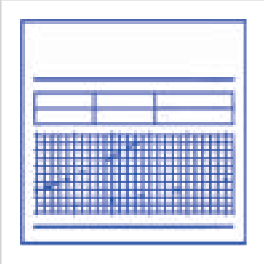
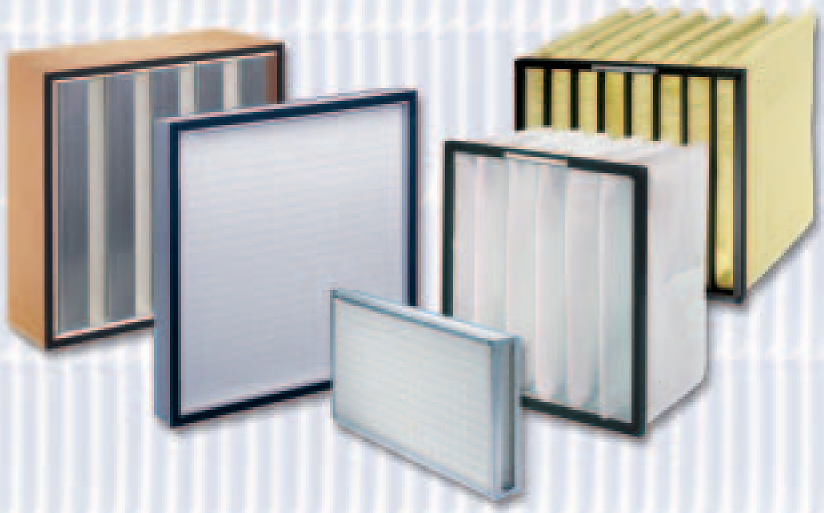


Air filter test method for testing coarse and fine dust filters

EN 779:2002



TROX® TECHNIK

The art of handling air

Air filter test method

for testing coarse and fine dust filters

Detail

Coarse and fine dust filters for separating contamination from the atmospheric air for general use in ventilation and air-conditioning systems and for process engineering applications.

As a uniform, reproducible test method for testing coarse and fine dust filters, European standard EN 779:2002 “Particulate air filters for general ventilation – Determination of the filtration performance” describes the requirements for particulate filters, the test method, and test rig for measuring the filter performance.

To guarantee quality, TROX tests its coarse and fine dust filters in its factory testing laboratory according to the EN 779:2002 standard.

Photo 1: TROX testing laboratory

Test method

For an example of the display of the test results, see page 5.

- **Measuring the initial differential pressure:** The initial differential pressure describes the differential pressure of the clean sample. In the case of coarse and fine dust filters, the initial pressure differential is measured at 50%, 75%, 100%, and 125% of the nominal volume flow rate. From the measurement results, a curve of the differential pressure as a function of the volume flow rate is created.
- **Measuring the arrestance:** The sample is fed in several steps using a defined synthetic test dust. After each individual dust fed, the actual synthetic dust arrestance is determined gravimetrically. For this purpose, a previously weighted final filter is removed from the test rig and reweighted, thus determining the mass of the test dust passing through the sample. The differential pressure measured on the sample increases with the number of dust challenges. The test is continued until the defined final differential pressure is reached. After that the average arrestance for the complete time of testing is calculated.
- **Calculation of the dust holding capacity:** The dust holding capacity is the product of the total mass of dust fed and the average synthetic dust arrestance.
- **Measurement of the efficiency:** In addition to the synthetic dust arrestance, the efficiency of fine dust filters is also tested. The efficiency is determined at the beginning (initial efficiency) and directly after each dust increment using a particle measurement. For the sample, an aerosol made of DEHS (DiEthylHexylSebacate) is generated within a size range of 0.2 µm to 3.0 µm and applied to the sample at the test volume flow rate. Complying with the precise requirements of the standard in terms of number and duration of measurements, the number of particles are sequentially measured on the upstream and downstream side of the test sample until the defined differential pressure for fine dust filter has been reached.

Classification

The air filters are classified depending on their test results under the following test conditions:

- The volume flow rate amounts to 0.944 m^3/s (3400 m^3/h) if the manufacturer has not defined another nominal volume flow rate.
- The maximum final differential pressure for coarse dust filters (G) amounts to 250 Pa.
- The maximum final differential pressure for fine dust filters (F) amounts to 450 Pa.

If filters are tested according to the above-mentioned parameters, the classification is based on the table below.

If filters are tested at volume flow rates and final differential pressures that deviate from those detailed above, the classification is still based on the table however the deviation of the test conditions must be added in parentheses.

Filter class	Final differential pressure Pa	Average synthetic dust arrestance (Am) of the synthetic test dust %	Average efficiency (Em) for particles of 0.4 µm %
G1	250	$50 \leqq A_m < 65$	-
G2	250	$65 \leqq A_m < 80$	-
G3	250	$80 \leqq A_m < 90$	-
G4	250	$90 \leqq A_m$	-
F5	450	-	$40 \leqq E_m < 60$
F6	450	-	$60 \leqq E_m < 80$
F7	450	-	$80 \leqq E_m < 90$
F8	450	-	$90 \leqq E_m < 95$
F9	450	-	$95 \leqq E_m$

Table 1: Classification for air filters according to EN 779

Annex A: (normative) Electrostatic discharging procedure

Certain types of filter media rely on electrostatic effects to achieve high efficiencies at low resistance to air flow.

Exposure to some types of challenge, such as combustion particles or oil mist, can neutralise such charges, which results in an impairment of the filter performance.

To evaluate this effect any treatment that completely discharges the filter medium may be used (isopropyl alcohol, diesel fumes, detergents, or surfactants in water).

Other discharging methods or test devices that are proven to lead to a complete discharge may also be used.

Independent test institutes

In Europe, there are two independent test institutes that are accredited according to EN 779.

VTT – Technical Research Centre of Finland

SP – Technical Research Institute of Sweden

Presentation of the test results

The test report contains all information on the sample, testing parameters, and test results. In addition, the test results are represented in graphical format.

Test results according to EN 779:2002

Initial pressure differential	Initial arrestance	Initial efficiency (0.4 µm)	Dust holding capacity	Untreated/ discharged efficiency of media (0.4 µm, Annex A):
63 Pa	**99 %**	**30 %**	**427/484/523 g**	**32/26 %**
Final pressure differential	Average arrestance	Average efficiency (0.4 µm)	Filter class (450 Pa)	
250/350/450 Pa	**99/99/99 %**	**64±2/67±1/69±1%**	**F6**	

Table 2: Test results for the air filter F746

For further test results, see “Register P.”

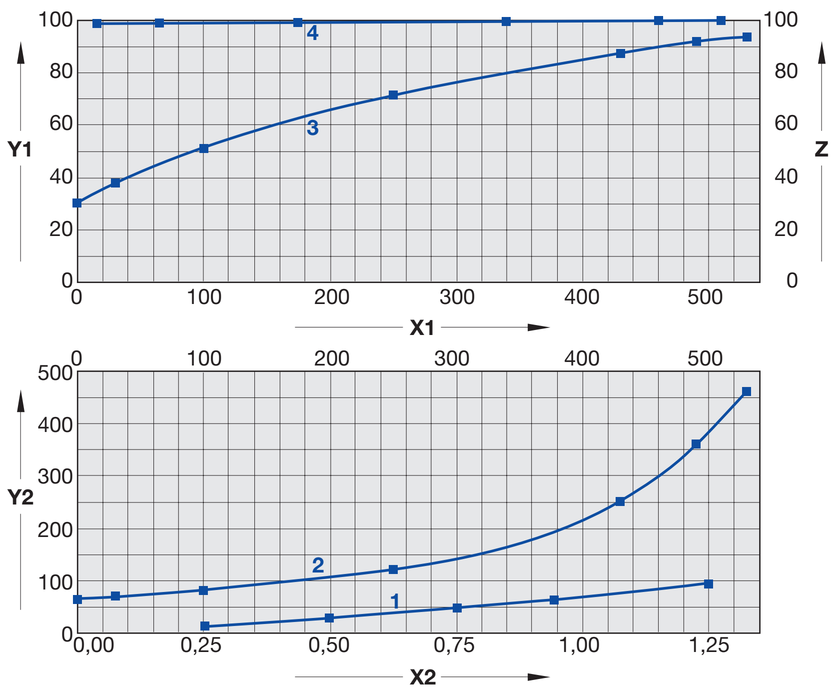


Diagram 1: Graphic representation of the test results

X1 = Dust fed, g
X2 = Air flow rate, m³/s
Y1 = Efficiency (0.4 µm) in %
Y2 = Differential pressure in Pa
Z = Arrestance in %

Curve 1:
Differential pressure as a function of the air flow rate (clean device).

Curve 2:
Differential pressure as a function of the dust fed at the test air flow rate.

Curve 3:
Efficiency (0.4 µm) as a function of the dust fed at the test air flow rate.

Curve 4:
Arrestance as a function of dust fed at the test air flow rate.

Air filter test method

for testing coarse and fine dust filters

EUROVENT Certification Programme

AIR FILTERS
CLASS F5-F9

Air filters: Certified according to EUROVENT

The certification programmes of Eurovent, the European association for manufacturers of air handling and air conditioning technology, form a basis for the comparison of the technical data of filter products. Certified products can be recognised by the symbol opposite.

Why EUROVENT?

Designers, engineers, and end customers have to rely on the technical characteristics of a filter medium being exactly as described by the manufacturer in the specifications and brochures. Eurovent has the performance specifications of the manufacturer validated by independent test institutes (e.g. VTT) and repeats this test annually to guarantee the reliability of the manufacturer's specifications. Thanks to strict regulations, the Eurovent Certification Programme guarantees a high quality level of the tested products.

All participating manufacturers must be certified according to ISO 9000. After a successful test, the participants are included in a certified product directory for the industry, which can be found on the following Internet site: http://www.eurovent-certification.com.

Certified products from TROX

All TROX filters fulfil the required criteria in regard to the initial pressure differential and the filter class. The fine dust filters of Grades F5 through F9 are Eurovent-certified.

EUROVENT CERTIFICATION COMPANY SCRL

Certification Diploma N° :

07.01.336

EUROVENT Certification Company certifies that

Fine Air Filters Class F5-F9

from

TROX GROUP

Located at

Siemensstrasse 24 , 47574 GOCH Germany

Trade name

TROX GmbH

EUROVENT
CERTIFIED PERFORMANCE

have been assessed according the requirements of following standard

OM-11-2008

The list of certified products is displayed at :

http://www.eurovent-certification.com

TROX GROUP
is authorised to use the EUROVENT Certification mark in accordance with the rules specified in the Operational Manual
OM-11-2008

Jacques BENOIST
Director of certification

Approval date :	31/01/07
Re-checked on :	31/12/07
Valid until :	31/12/08

Photo 2: Certificate No. 07.01.336

References

Photo 3: Neckermann product return centre (Frankfurt am Main)

Photo 4: Autostadt Museum Zeithaus (Wolfsburg)

Photo 5: AVIVA office building (Munich)

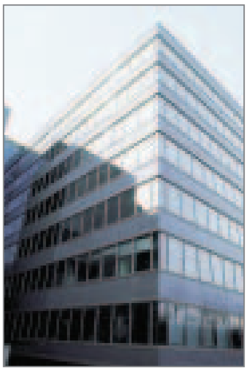


Photo 6: Neckermann computer centre (Frankfurt am Main)

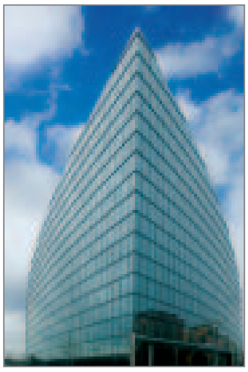


Photo 7: Main-Triangle office building (Frankfurt am Main)

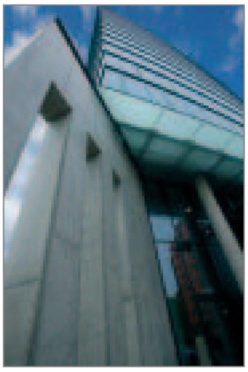


Photo 8: Main-Triangle office building (Frankfurt am Main)

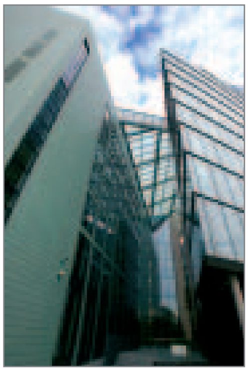


Photo 9: Main-Triangle office building (Frankfurt am Main)

TROX® TECHNIK
The art of handling air

TROX GmbH

Siemensstraße 24
47574 Goch, Germany
Phone +49 (0) 28 23/10 09-0
Fax +49 (0) 28 23/10 09-14
E-mail troxfilter@trox.de
www.troxtechnik.com

Filters