FET 100

The FET 100 enables testing of the smallest filter elements up to 100 x 100 mm, such as medical filters, vacuum cleaner end filters, and fan filters. Coarse filters up to ULPA filters are tested for particle size separation and differential pressure. The FET 100 measures better than required by the standards. Thanks to individual adapters and customer-specific adjustments in the air duct, the FET system can be used for a wide variety of filter elements.

Operation principle

Test system for small filter elements up to a cross-sectional area of 100 • 100 mm

The aerosol and mixed air feed is pressure-operated on the upstream side of the FET 100.

The air volume flows required for this are precisely controlled on the input side via a mass flow controller. In the case of HEPA filter testing, the aerosol is classified monodispersely. In the vertically arranged test duct, the aerosol is then homogeneously mixed.

Aerosol extraction for particle measurement is then carried out representatively under consideration of the isokinetic. One measuring point is provided for aerosol extraction.

The measuring instruments used are the Palas U-SMPS[1] or the aerosol spectrometers of the Promo ® system[2] , which can cover a measuring range from 0.01 to 40 μm, depending on the selection.

After the raw gas measurement has been completed, the filter element is inserted into the test channel. The filter holder can be easily and quickly opened pneumatically for this purpose. Individual adapters can be made for different designs of filter elements.

Now the filter element is tested. The pressure drop, clean gas concentration, and size of the clean gas aerosol are determined, and fractional separation efficiency is calculated.

The system is easily controlled via the integrated FTControl[3] test rig control system. Individual sequence programs ensure that the measurements are carried out safely.

A comprehensive analysis section allows a simple and fast evaluation of the measurement results.

[1] U-SMPS: https://www.palas.de//product/usmps
[2] Promo® system: https://www.palas.de//product/promo
[3] FTControl: https://www.palas.de//product/ftcontrol

Extensions/Accessories

Aerosol generation

Due to the modular design, various test aerosols can be generated depending on the aerosol generator used: DEHS, oils, paraffin oil, NaCl or KCl, and test dust such as ISO A2 Fine.

Aerosol discharge

Depending on the application, the aerosol discharge is carried out via the electrical corona discharge CD 2000[4] or the X-ray source XRC 049[5] , which is not subject to approval.

Aerosol dilution

The dilution systems of the VKL series are to be used especially when measuring high HEPA filter qualities (filter efficiency >99.95%). When using dilution systems, a measuring point switch for the dilution factor (1,10,100,1000,10000) is used for easy filter testing.

Aerosol measurement

The aerosol measurement takes place

- in the range from 0.01 to max. 1.2 μm with the Palas U-SMPS[6] ,
- in the range from approx. 0.12 to 100 μm with the aerosol spectrometer of the Promo ® system[7] .

The two measuring instruments can be combined and used simultaneously as a U-Range[8] for the entire range.

[4] CD 2000: https://www.palas.de//product/cd2000
[5] XRC 049: https://www.palas.de//product/xrc049
[6] U-SMPS: https://www.palas.de//product/usmps
[7] Promo® system: https://www.palas.de//product/promo
[8] U-Range: https://www.palas.de//product/seriesurange

Benefits

- Applicability of many test standards in one channel (according to ISO 29463-5 and 29463-3, as well as ISO 16890 (ISO ePM_1; ISO $ePM_{2.5}$)
- Double channels on request
- Particularly wide range of applications for separation efficiency measurement from 0.02 to 40 μm
- Measurement of dust storage capacity possible
- Customization for optimal test execution possible
- Horizontal design to minimize particle losses
- No need to balance raw gas and clean gas, as there is only one sampling and one measuring device
- Protocoled results based on the relevant standards
- Test benches tested and calibrated ex works

DATASHEET

Aerosols	Dusts (e.g., SAE dusts), salts (e.g., NaCl, KCl), liquid aerosols (e.g., DEHS), latex particles (PSL)
Measuring range (total penetration)	Up to 0.0005 %
Measurement range (size)	0.02–100 μm
Volume flow	1 – 27 m^3/h - pressurized operation
Differential pressure measurement	0 – 1,200 Pa selectable, 0 – 2,500 Pa selectable, 0 – 5,000 Pa selectable
Size filter element	100 • 100 • 100 mm (H • W • D)

APPLICATIONS

- Quality control for
  - HEPA/ULPA clean room filters
  - Cabin air filters
  - Cabin filters
  - Engine air filters
  - Compressor supply air filters
- Development
- Measurement of MPPS according to ISO 29463-5 and ISO 29463-3
- Measurement of the fractional separation efficiency according to ISO 16890
- Determination of the pressure loss at different volume flows
- Determination of dust holding capacity

Mehr Informationen:
https://www.palas.de/product/FET100