MFP 1000 HEPA

The MFP filter test rig is a modular filter testing system for flat filter media and small mini-filters. Pressure loss curves, fraction separation efficiency or burden can be determined within a very short period of time – both reliably and cost-effectively. With the aid of the light scattering spectrometer Promo® 1000, clear and reliable determination of the aerosol concentration and the particle size can be ensured, and therefore a clear determination of the fraction separation efficiency and the MPPS range for HEPA filters.
Thanks to the movable dilution cascades, the test rig can be changed over from salt aerosols to DEHS aerosols within a very short space of time, with no need for cleaning.The largely automated setup of the test sequence together with the clearly defined individual components and the individually adjustable sequence programs of the filter test software FTControl combine to deliver the high reliability of our measurement results.

OPERATION PRINCIPLE

MFP 1000 HEPA WITH PROMO® 1000

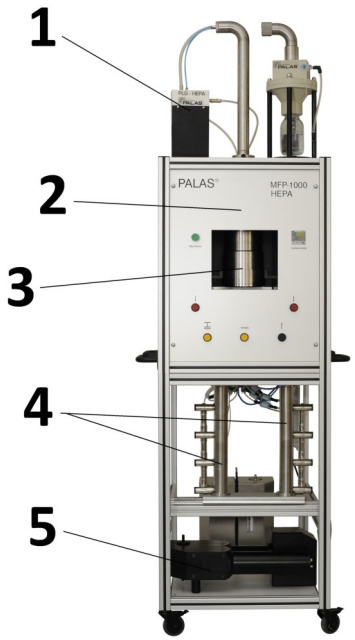

Fig. 1: MFP 1000 HEPA

1. Variable aerosol generation through the use of special dispersers for KCl/NaCl or DEHS. Integrated drying length, no silica gel! The generated salt aerosol is dried using dry compressed air. The volume flow for drying can be individually regulated via mass flow controllers.

2. Corona discharge (optional): Adjustable ion stream for different mass flows. Adjustable mixed air for inflow speeds from 1.5 to 40 cm/s. Monitoring and control are implemented via mass flow controllers.

3. Mobile pneumatic filter holder for fast removal and loading of the test rig.

4. Movable dilution cascades: The dilution cascades enable defined dilution of the applied test aerosol by the factors 10, 100, 1,000 and 10,000. As they are movable, the test rig can be changed over in a very short time from salt aerosols to DEHS aerosol. Lengthy or complex cleaning of the systems is not required.

5. Light scattering spectrometer Promo® 1000 for HEPA filters: The Palas® filter test software FTControl controls the light scattering spectrometer that is used and evaluates the data. Palas® recommends the following for clear measurement of the fraction separation efficiency and determination of the MPPS range:

- Light scattering spectrometer Promo® 1000 for HEPA filters
- Light scattering spectrometer with lower detection limit from 90nm for HEPA / ULPA filters

Measurement of fraction separation efficiency, MPPS determination

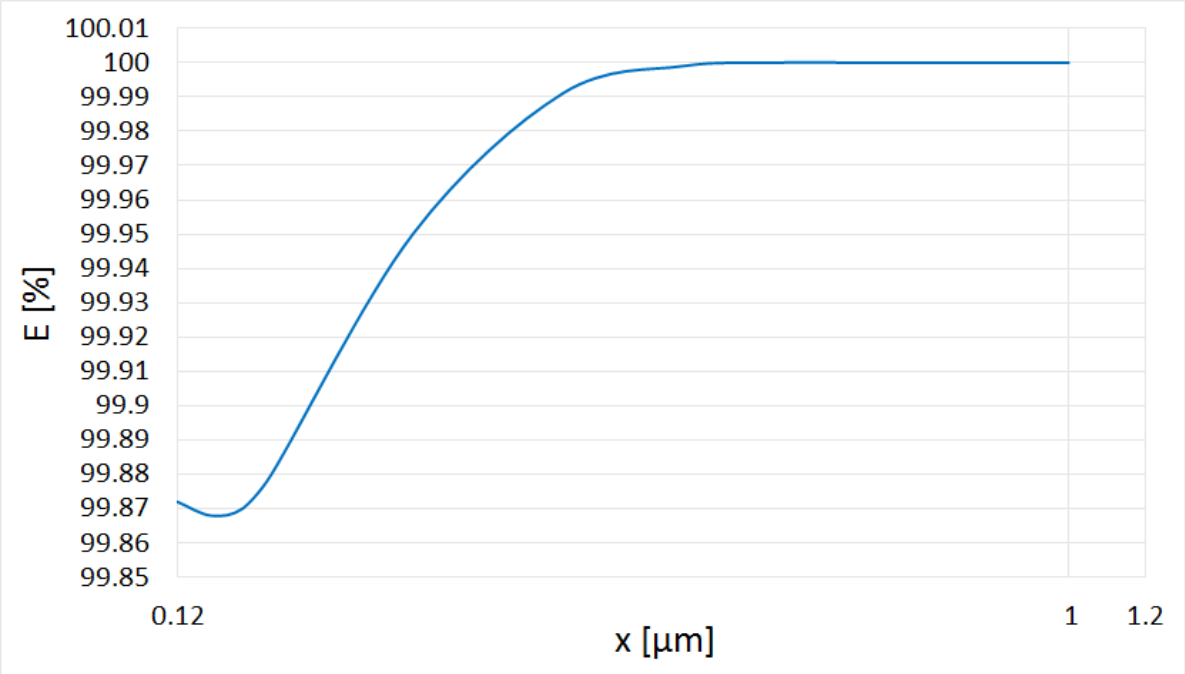

Fig. 3: Promo® 1000: Fraction separation efficiency / MPPS at 130 nm, Promo® 1000

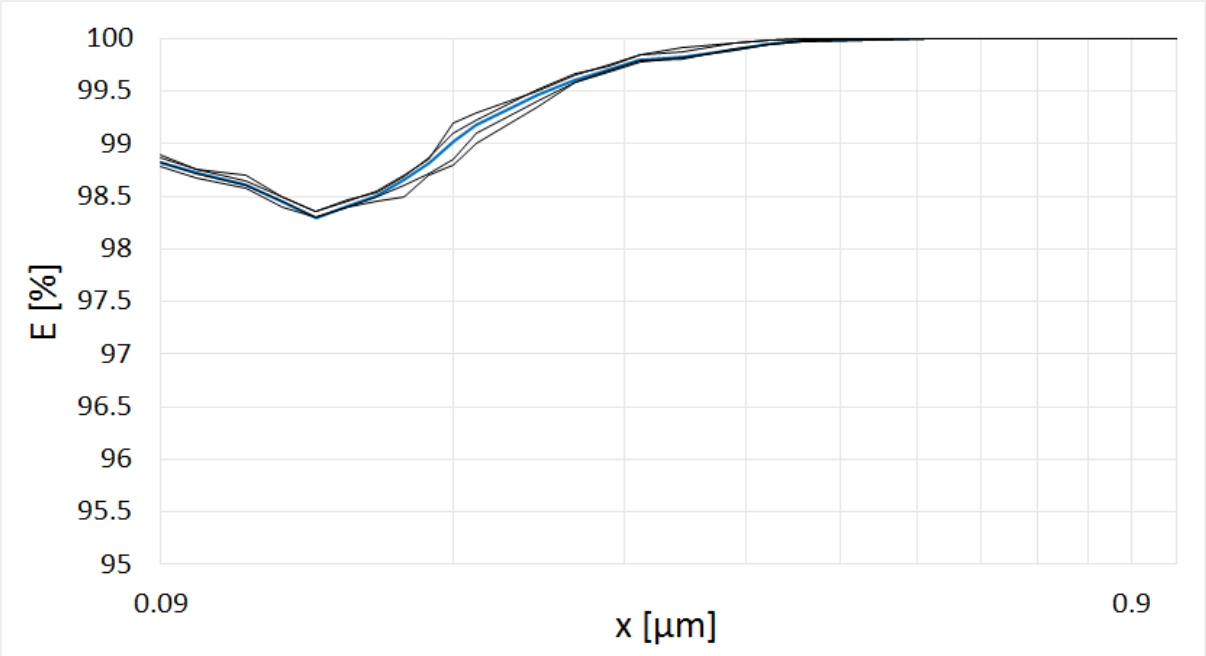

Fig. 4: Comparison of fraction separation efficiencies, MPPS at 120 nm

- Clear demonstration of the separation efficiency of your filter medium throughout the entire measurement range
- Clear determination of the MPPS range
- With its maximum sensitivity, the particle measurement technology can highlight even fine differences in separation efficiency.
- Short measurement times of around 2 minutes per separation efficiency measurement thanks to optimized aerosol application
- Simple comparison of separation efficiency curves, calculation of mean values also possible

Automation

The MFP 1000 HEPA has an integrated mass flow controller that it uses to control the volume flow; this can be automatically monitored and controlled via the FTControl filter test software. The sensor data such as the volume flow and differential pressure at the filter are automatically also recorded during the filter test.

BENEFITS

- Particle size measurement from 120 nm (90 nm)
- Internationally comparable measurement results
- Simple use of different test aerosols, such as NaCl / KCl or DEHS; other test aerosols on request
- Easily shiftable dilution cascades with factors of 10, 100, 1,000 and 10,000 for measurements with salt or DEHS
- Simple measurement of the fraction separation efficiency and determination of the MPPS range
- Burden measurements up to 2500 Pa with fraction separation efficiency determination possible
- High reproducibility of the test method
- Cleaning can be performed by the customer
- Short set-up times, fast throughput times
- Mobile set-up, easy to move on castors
- Clear verification of the function of the individual components and the system as a whole in the scope of pre-delivery acceptance testing and at delivery
- Little maintenance required

NORMS AND CERTIFICATES

ISO 11155-1, ASHRAE 52.2, ISO 5011, ISO 16890, ISO 29463-3, EN 1822-3 (HEPA), ISO 29463-3 (HEPA), EN 779, EN 1822

DATASHEET

Aerosols	Dusts (e.g., SAE dusts), salts (e.g., NaCl, KCl), liquid aerosols (e.g., DEHS)
Test area of the medium	100 cm^2
Measurement range (size)	0.09 – 40 μm
Measurement range (mass)	Up to 1,000 mg/m^3 (depending on the version)
Volume flow	0.54 – 16 m^3/h - pressurized operation
Power supply	115 – 230 V, 50/60 Hz
Differential pressure measurement	0 – 1,200 Pa selectable, 0 – 2,500 Pa selectable, 0 – 5,000 Pa selectable
Inflow velocity	1.5 – 40 cm/s (others on request)
Compressed air supply	6 – 8 bar
Dimensions	1,800 • 600 • 900 mm (H • W • D)

Applications

- MPPS (**M**ost **P**enetrating **P**article **S**ize) fractional efficiency measurements according to ISO 29463 and EN 1822
- Testing of filter media and small mini filters in product development and production monitoring
- Testing of initial efficiency according to ISO 11155-1 (cabin air filters), ISO 5011 (engine air intake filters), EN779/ASHRAE 52.2 (cabin air filters) and other standards in different versions

Mehr Informationen:
https://www.palas.de/en/product/mfp1000hepa