TOPAS®
Technologie-orientierte Partikel-, Analysen- und Sensortechnik

Laser Aerosol Particle Counter

LAP 340/L

Laser Aerosol Particle Counter LAP 340/L.

Using the LAP 340/L single particle scattered light counter, low-concentration aerosols - gaseous samples containing gas-borne particles - are analysed in terms of particle number and size.

Optical particle counters are used for quality control in filter production and optimisation. The requirements for the measuring instrument arise mostly from the applied standards and directives.

The particle counter is characterised by a wide measuring range (0.2 - 10 µm) and a high measuring volume flow of 2.83 l/min. Compared to aerosol spectrometers, the LAP 340/L enables efficient analysis of large sample volumes. The particle counter is designed for stationary and mobile use.

Applications

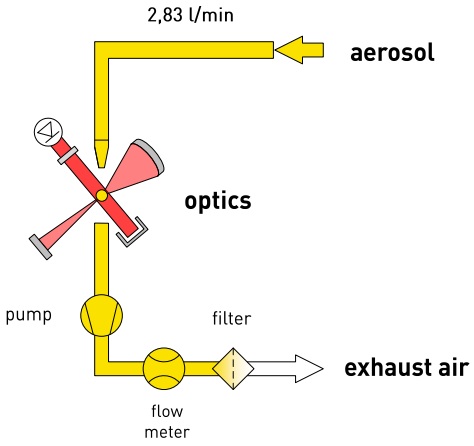
- filter tests and air filter testing in accordance with ISO 16890-2, ASHRAE 52.2, EN 779
- determination of fractional efficiencies of filter media, filters and separators
- emission measurements of vacuum cleaners and air cleaners
- workplace measurements

Features

- good counting statistics due to the high measuring volume flow rate
- wide particle size measuring range with 16 configurable particle size classes
- application-oriented calibration function
- integration into complex test systems possible

Principle of operation

For testing gaseous samples with particles, the measuring device sucks in a sampling volume flow of 2,83 l/min via an internal pump. The entire sample is fed into the measuring cell and exposed to light from a laser diode. A photodetector detects the light scattered by the particles. The signals are processed and classified into different classes according to the pulse height. A calibration function is used to correlate the pulse height classes to the respective particle size. Based on the number of signals, the number of particles in the examined sample is determined.



Simplified operation principle of the LAP 340/L.

Topas GmbH
Technologie-orientierte
Partikel-, Analysen- und Sensortechnik
Gasanstaltstraße 47 · D-01237 Dresden, GERMANY

Telefon +49 (351) 21 66 43 - 0
Fax +49 (351) 21 66 43 55
E-Mail office@topas-gmbh.de
Internet www.topas-gmbh.de

TOPAS-GMBH.DE
PARTICLE UNDER CONTROL

Specifications

Details

The measurement results can be displayed in the following ways: i) internal display, ii) printout via the internal printer or iii) on a PC with suitable software (PAFWin®, PASWin®).

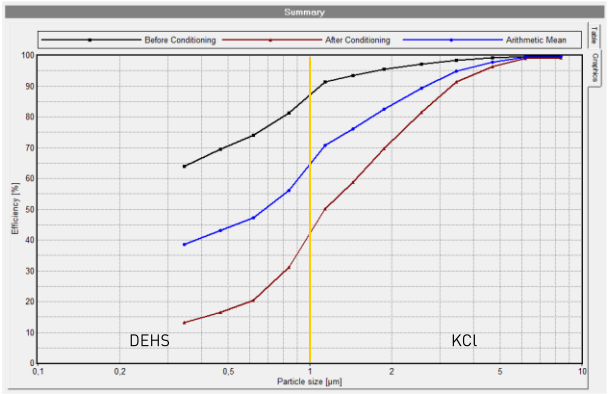
If the particle counter is used for standardised air filter testing or fractional efficiency determination, the requirements of the respective standard must be observed.

Excerpt of the requirements for an optical particle counter depending on the applied standard:

	ISO 16890-2	EN 779	ASHRAE 52.2
measuring range in µm	✓ 0,3 – 10	✓ 0,2 – 3,0	✓ 0,3 - 10
number of size classes	✓ 12	✓ 5	✓ 12

✓ requirement is fulfilled by LAP 340/L

The particle counters can be integrated into complex test systems. Controlling the measuring device as well as recording and evaluating the measurement data is carried out via the serial interface and with the help of the test system software PAFWin.



Fractional efficiency curve according to ISO 16890 before (black) and after (red) filter element conditioning.

An efficient measurement procedure with optimal measurement results is achieved by using two identical particle counters on the test system, which are placed close to the upstream and downstream sampling points. Differences between the particle counters due to manufacturing are eliminated via a software adjustment. This set-up shortens the measurement time and reduces particle losses.

Optical particle counters laboratory comparison

Within the framework of an interlaboratory test, which was summarised by Professor Schmidt et al. in 2019, fractional efficiency curves of fine particle filters were determined using various test setups. DEHS (di-ethyl hexyl sebacate; droplet size 0.3 – 1 µm) and KCl (potassium chloride; particle size 1 – 10 µm) were used as aerosol substances for the test aerosols. Despite the use of different particle counters, the fractional efficiencies determined for the filters are in excellent agreement.

Optional accessories

- data acquisition software: PAFWin
- dilution system DIL 545
- measuring instrument case
- aerosol tubing ¼"

References

Schmidt et al. (2019) Die Prüfung von Filtern für raumlufttechnische Anlagen nach DIN EN ISO 16890. F&S Filtrieren und Separieren, 33 (2), 82 - 86.

Technical specifications

flow generation	vacuum pump
number of size classes	16, configurable
measuring range	0,2...10 µm
max. measuring concentration	~70/cm³
display and control	LCD display, operable via 19 keys
measuring modes	single measurement continuous measurement
measuring and pause time	1 (or 0) s...99 h
Computer interface	RS 232 C (V. 24)
power supply	230 V AC, 50/60 Hz, (115 V AC on request)
dimensions (w × d × h)	410 × 280 × 180 mm
weight	10 kg
normative references	ISO 16890-2, EN 779, ASHRAE 52.2

Topas GmbH
Technologie-orientierte
Partikel-, Analysen- und Sensortechnik
Gasanstaltstraße 47 · D-01237 Dresden, GERMANY
Telefon +49 (351) 21 66 43 - 0
Fax +49 (351) 21 66 43 55
E-Mail office@topas-gmbh.de
Internet www.topas-gmbh.de