PMFT 1000 F

The PMFT 1000 F tests particle filters for full-face masks better than the standards EN 143, ISO 16900-3, and NIOSH 42 CFR 84, with additional precise analysis of filter mask efficiency for SARS-CoV-2 (size approx. 120 nm to 160 nm). Furthermore, the testing of face masks based on the standards EN 149/EN 13274-7 and GB 2626 is possible.

The tests measure the photometric total penetration and the fractional separation efficiency, i.e., the efficiency based on particle size and the particle size-dependent penetration.

Operation principle

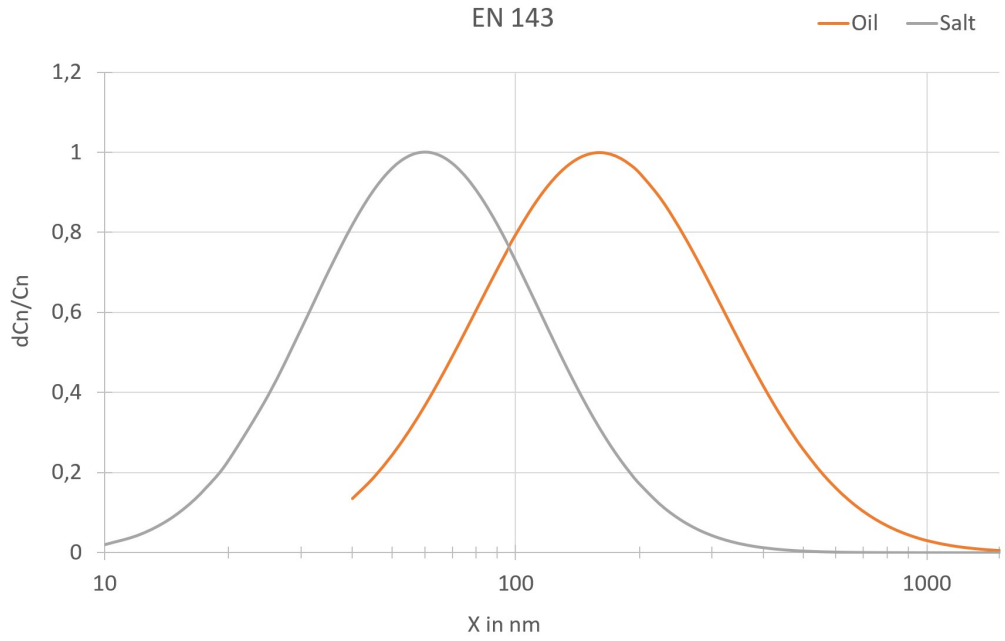
PMFT 1000 F as an all-rounder in testing of nearly all mask and filter types

The measurement of total and particle size-dependent penetration is carried out using the high-precision aerosol photometer Promo® LED 2300. An automatic measurement switch allows efficiency measurement without dilution up to 99.9995% at higher particle concentrations in the raw gas.

The size distribution of the test aerosol is as follows:

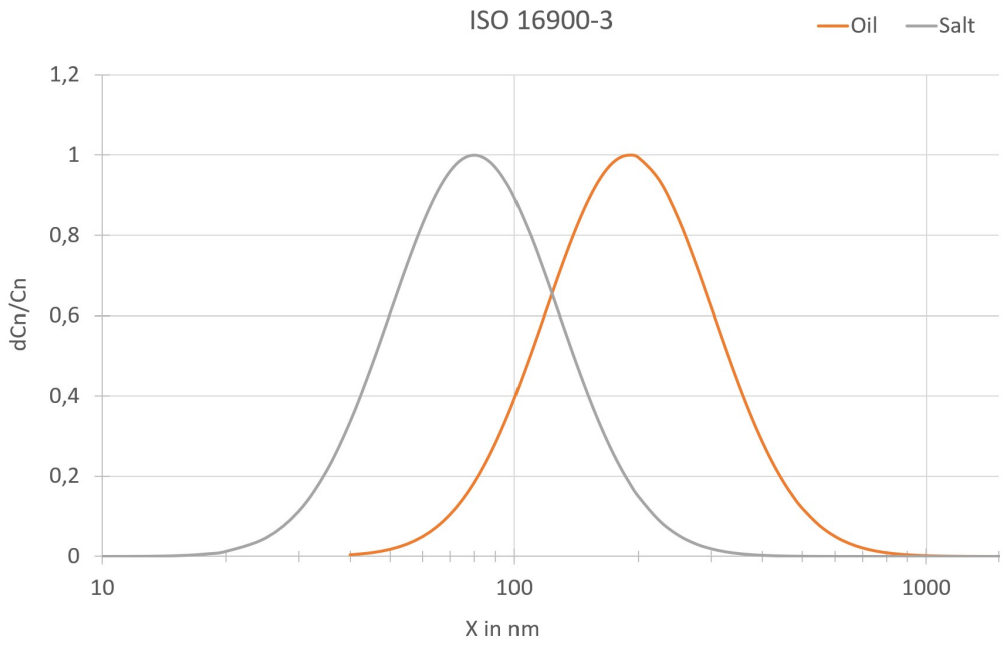
EN 143

Oil: Median diameter 160 nm | Geom. standard deviation ~ 2
Salt: Median diameter 60 nm | Geom. standard deviation ~ 1,9



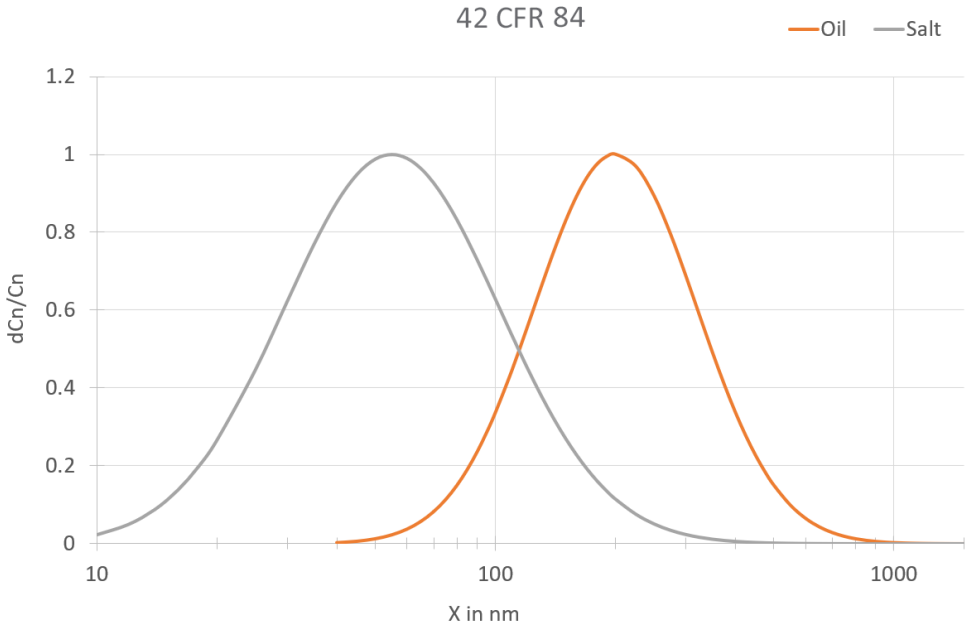
ISO 16900-3

Oil: Median diameter 190 nm | Geom. standard deviation 1,4 - 1,8
Salt: Median diameter 80 nm | Geom. standard deviation 1,4 - 1,8



42 CFR 84

Oil: Median diameter 200 nm | Geom. standard deviation <1,6
Salt: Median diameter 55 nm | Geom. standard deviation <1,86



Based on the measurement of particle penetration via particle size, the PMFT 1000 F can also be used to consider the tolerances in the particle size distribution according to EN 13274-7 as a min. / max. penetration value.

	EN 143	EN 143	ISO 16900-3	ISO 16900-3	42 CFR 84	42 CFR 84
Aerosol	NaCl	PaO	NaCl	PaO	NaCl	DOP
Average diameter	ca. 0,06 µm	ca. 0,16 µm	0,06 – 0,1 µm	0,16 – 0,21 µm	0,055 – 0,095 µm	0,165 – 0,205 µm
Standard deviation	ca. 1,9	ca. 2	1,4 – 1,8	1,4 – 1,8	< 1,86 (through additional software module)	< 1,6 (through additional software module)
Concentration	4 –12 mg/m³	15 – 35 mg/m³	8 – 35 mg/m³	15 – 35 mg/m³	< 200 mg/m³	< 200 mg/m³
Discharge	necessary	-	necessary	-	necessary	necessary
Airflow	95 l/min	95 l/min	still to be defined	still to be defined	85 ± 4 l/min	85 ± 4 l/min
Temperature	22 ± 3 °C	24 ± 8 °C	22 ± 3 °C	24 ± 8 °C	25 ± 5 °C	25 ± 5 °C
Rel. humidity < 40 %	< 40 %	20 - 80 %	< 40 %	20 – 80 %	20 – 40 % (with compressed air)	20 – 40 % (with compressed air)
Measuring device	Sodium flame photometer	Light scattering photometer	Sodium flame photometer	Light scattering photometer	Light scattering photometer	Light scattering photometer
Measuring time	30 s	30 s	30 s	30 s	lowest charging efficiency	lowest charging efficiency
Break time	180 s	180 s	180 s	180 s	lowest charging efficiency	lowest charging efficiency
Exposition	120 mg	120 mg	150 mg	150 mg	200 ± 5 mg	200 ± 5 mg
PMFT Remarks	O.K.	O.K.	O.K.	O.K.	O.K.	O.K.

Table 2: Overview of standards for filter testing of full-face masks

Extensions/Accessories

The PMFT 1000 F is equipped with aerosol generators for measuring penetration with oil and salt. Measurement procedures for quick quality control (short test) or for testing according to standards (exposure test) are included. A corona discharge test with the CD 2000 A is integrated.

Operation and automatic printing of the measurement results are therefore easy, even for inexperienced users.

BENEFITS

- Test bench performance exceeds EN 143, ISO 16900-3, 42 CFR 84, EN 149, 13274-7, and GB 2626
- Determination of total photometric penetration for the size range according to standard
- Supplied with two aerosol generators for NaCl and oil
- Integrated corona discharge with CD 2000 A
- Testing of fractional efficiency, e.g., efficiency across the entire size range from 145 nm to 5 μm
- Accurate analysis of filter and filter mask efficiency for SARS-CoV-2 (size approx. 120 nm to 160 nm). Efficiency analysis at 145 nm
- Future-proof: Works with any type of aerosol without adjustments
- Additional measurement of the differential pressure, e.g. also at different flow velocities to simulate breathing resistance
- Flow velocity adjustable between 1.5 and 70 cm/s
- Product for rapid quality assurance **and** continuous optimization in R&D (Representation of size distribution)
- Can be used with standard filter fittings according to EN 148-1
- Measurement of filter efficiencies up to 99.9995%

NORMS AND CERTIFICATES

CCF (Covid Certified Filter), EN 149, EN 13274-7, GB 2626, 42 CFR 84

DATASHEET

Aerosols	Salts (e.g. KCl, NaCl), liquid aerosols (e.g. DEHS), latex particles (PSL)
Test area of the medium	100 cm^2
Measuring range (total penetration)	0.0005 - 100 %
Measurement range (size)	0.145 – 40 μm
Volume flow	1 – 27 m^3/h - pressurized operation
Power supply	115 – 230 V, 50/60 Hz
Installation conditions	+10 – +40 °C
Differential pressure measurement	0 – 1,200 Pa
Inflow velocity	1.5 – 70 cm/s (others on request)
Compressed air supply	6 – 8 bar
Dilution factor	1 : 27 / 1 : 700
Test conditions according to standard	+19 – +23 °C
Dimensions	Approx. 1,800 • 600 • 900 mm (H • W • D)

APPLICATIONS

- Testing of full face mask filters for use with standard filter fittings according to EN 148-1
- Measurement of total penetration of respirators
- Exact analysis of filter mask efficiency, e.g. coronavirus
- Media test for HEPA quality

Mehr Informationen:
https://www.palas.de/en/product/pmft-1000-f