



PMFT 1000 F as an all-rounder in the testing of almost all mask and filter types. Test of total penetration better than the standard, exact analysis of filter mask efficiency from 145 nm to 40 μm

Description

The PMFT 1000 F tests respiratory protection particle filters better than the standards EN 143, ISO 16900-3 and NIOSH 42 CFR 84 with additional accurate analysis of filter mask efficiency for SARS-CoV-2 (size approximately 120 nm to 160 nm). In addition, the testing of face masks based on the EN 149/ISO 13274-7 standards is possible. Both total photometric penetration and fractional efficiency are tested e.g., the efficiency in the whole size range respectively the particle size-dependent penetration.

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 standard (exposure test) are supplied.

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

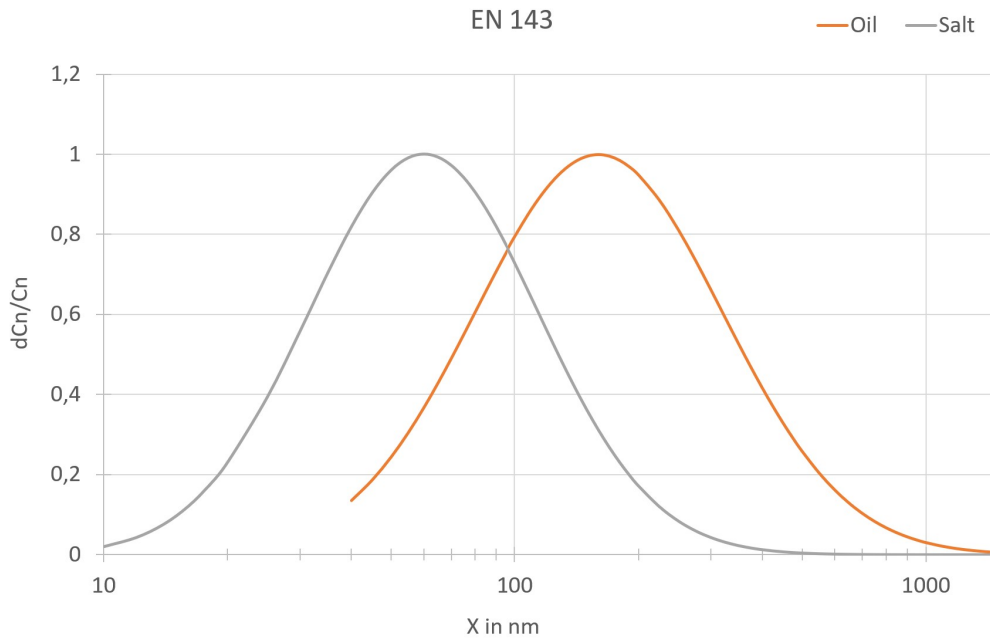
The measurement of total penetration and penetration via particle size is carried out with the high-precision aerosol photometer Promo LED 2300. An automatic switch allows efficiency measurements without dilution up to 99.9995 %.

The size distribution of the test aerosol according to the standard is as follows:

EN 143

Oil: Media diameter ca. 160 nm | Geom. standard deviation < 2

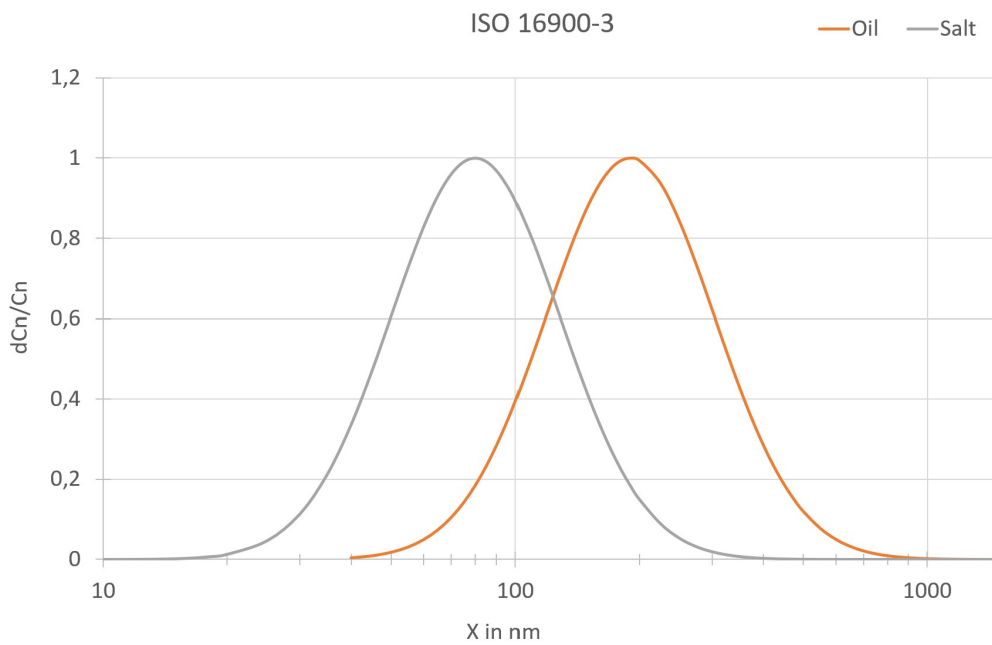
Salt: Media diameter ca. 60 nm | Geom. standard deviation < 1.9



ISO 16900-3

Oil: Media diameter 190 nm | Geom. standard deviation 1.6

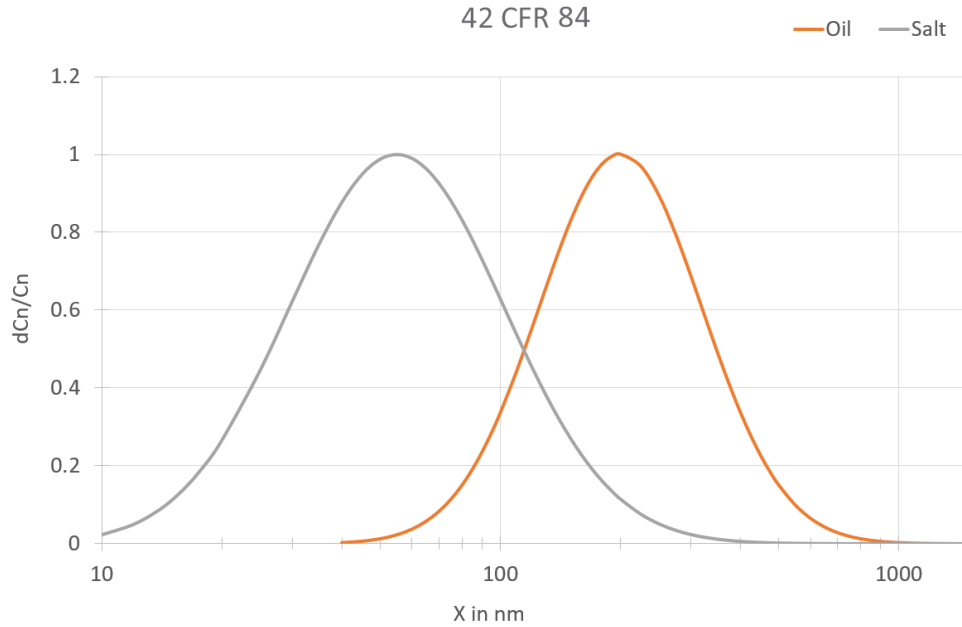
Salt: Media diameter 80 nm | Geom. standard deviation 1.6



42 CFR 84

PMFT 1000 F

Oil: Media diameter 200 nm | Geom. standard deviation 1.6
Salt: Media diameter 55 nm | Geom. standard deviation 1.86



Based on the measurement of the particle penetration via the particle size, the PMFT can also be used to consider the tolerances in the particle size distribution according to EN 13274-7 as 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
Mean diameter	approx. 0.06 μm	approx. 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	approx. 1.9	approx. 2	1.4 – 1.8	1.4 – 1.8	< 1.86 (by additional software module)	< 1.6 (by additional software module)
Concentration	4 – 12 mg/m^3	15 – 35 mg/m^3	8 – 35 mg/m^3	15 – 35 mg/m^3	< 200 mg/m^3	< 200 mg/m^3
Discharge	required	-	required	-	required	required
Air flow	95 l/min	95 l/min	to be defined	to be defined	85 \pm 4 l/min	85 \pm 4 l/min
Temperature	22 \pm 3 $^{\circ}\text{C}$	24 \pm 8 $^{\circ}\text{C}$	22 \pm 3 $^{\circ}\text{C}$	24 \pm 8 $^{\circ}\text{C}$	25 \pm 5 $^{\circ}\text{C}$	25 \pm 5 $^{\circ}\text{C}$
Rel. humidity	< 40 %	20 – 80 %	< 40 %	20 – 80 %	20 – 40 % (by compressed air)	20 – 40 % (by compressed air)
Measurement 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 eff. during loading	lowest eff. during loading
Pause time	180 s	180 s	180 s	180 s	lowest eff. during loading	lowest eff. during loading
Exposition	120 mg	120 mg	150 mg	150 mg	200 \pm 5 mg	200 \pm 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 personal protection masks

Benefits

- Test rig working principle better than EN 143, ISO 16900-3, 42 CFR 84, EN 149 and EN 13274-7
- Determination of photometric total penetration for the size range according to standard
- Includes two aerosol generators for NaCl and for oil
- Testing of fractional efficiency, e.g., efficiency in whole size range of 145 nm up to 40 μm
- Exact analysis of filter and filter mask efficiency for SARS-CoV-2 (size approx. 120 nm up to 160 nm). Efficiency also displayed at 145 nm
- Future proof: Works with any kind of aerosol without adjustments

PMFT 1000 F



- Further measurement of differential pressure, e.g., as well within different face velocities to simulate test of breathing resistance
- Face velocity adjustable between 1.5 – 70 cm/s
- Product for fast quality assurance **and** continuous optimization in RD (display of size distribution)
- Attractive two years maintenance package for availability of test rig
- Can be operated with standard filter threads according to EN 148-1
- Measurement of filter efficiencies up to 99.9995 %

Datasheet

<i>Parameter</i>	<i>Description</i>
Measuring range (total penetration)	0,0005 - 0,1%
Measurement range (size)	0.145 – 40 μm
Volume flow	1 – 27 m ³ /h- pressurized operation
Installation conditions	+10 – +40 °C
Inflow velocity	1.5 – 70 cm/s (others on request)
Differential pressure measurement	0 – 1,200 Pa
Test area of the medium	100 cm ²
Aerosols	Salts (e.g. KCl, NaCl), liquid aerosols (e.g. DEHS), latex particles (PSL)
Compressed air supply	6 – 8 bar
Dilution factor	1:27 / 1:700
Power supply	115 – 230 V, 50/60 Hz
Test conditions according to standard	+19 – +23 °C
Dimensions	Approx. 1,800 • 600 • 900 mm (H • W • D)

Applications

- Test of respiratory masks with standard filter threads according to EN 148-1
- Test of total penetration for respiratory masks
- Exact analysis of filter mask efficiency for e.g., Coronavirus
- Filter testing for HEPA quality

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