PMFT 1000



The PMFT 1000 tests respirators better than the standards EN 149/EN 13274-7 with additional accurate analysis of filter mask efficiency for SARS-CoV-2 (size approximately 120 nm to 160 nm). Both total photometric penetration and fractional efficiency are tested e.g., the efficiency in the whole size range respectively the particle size-dependent penetration.

Operation principle

PMFT 1000 for development and production monitoring of half masks

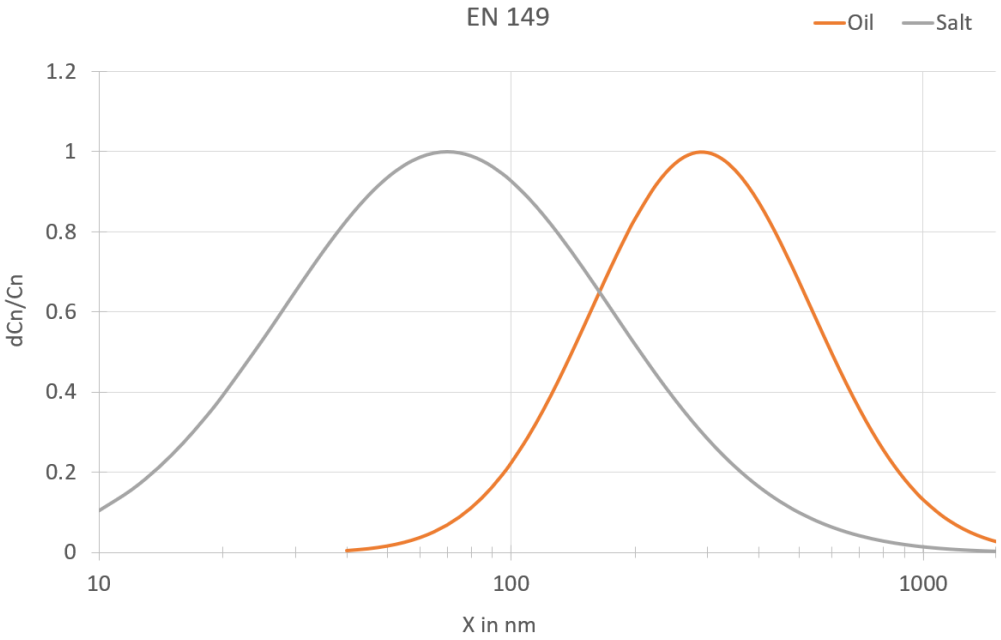
The measurement of total penetration and penetration via particle size is carried out with the high-precision Promo® 1000 aerosol photometer.

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

EN 149

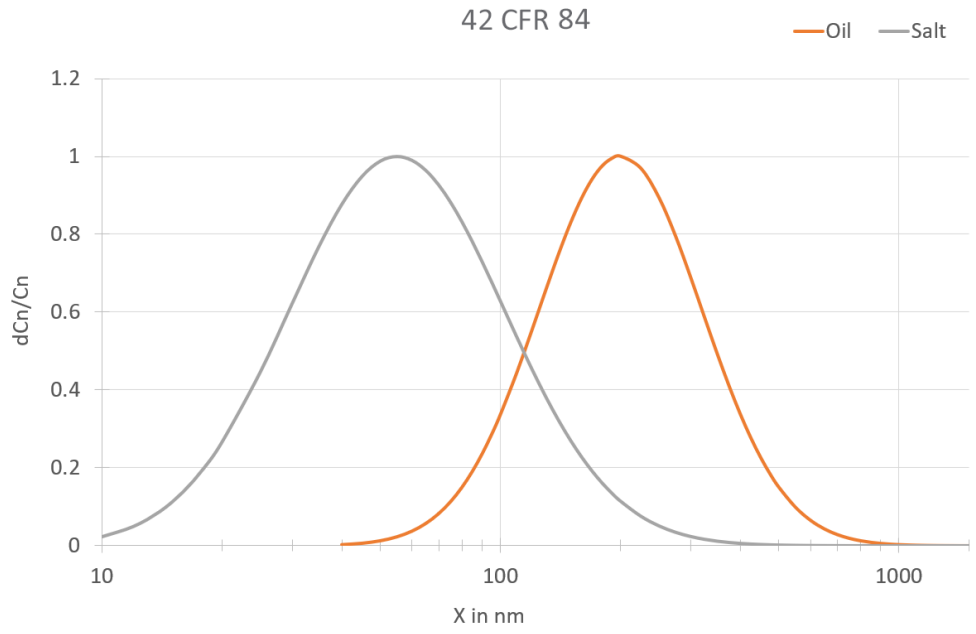
Oil: Media diameter 290 nm | Geom. standard deviation 1.85

Salt: Media diameter 70 nm | Geom. standard deviation 2.5

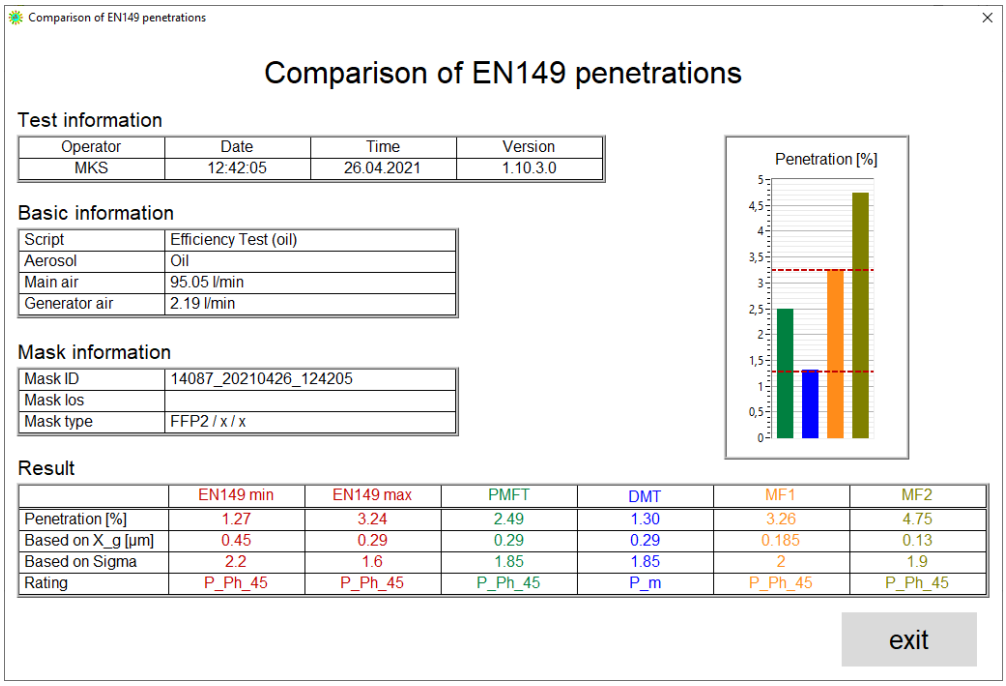


42 CFR 84 / GB 2626

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 particle penetration via particle size, the PMFT 1000 can also be used to view the tolerances in the particle size distribution according to EN 13274-7 as min. / max. penetration values. In addition, comparative values to other manufacturers are possible (option).


Comparison of EN149 penetrations

Comparison of EN149 penetrations

Test information

Operator	Date	Time	Version
MKS	12:42:05	26.04.2021	1.10.3.0

Basic information

Script	Efficiency Test (oil)
Aerosol	Oil
Main air	95.05 l/min
Generator air	2.19 l/min

Mask information

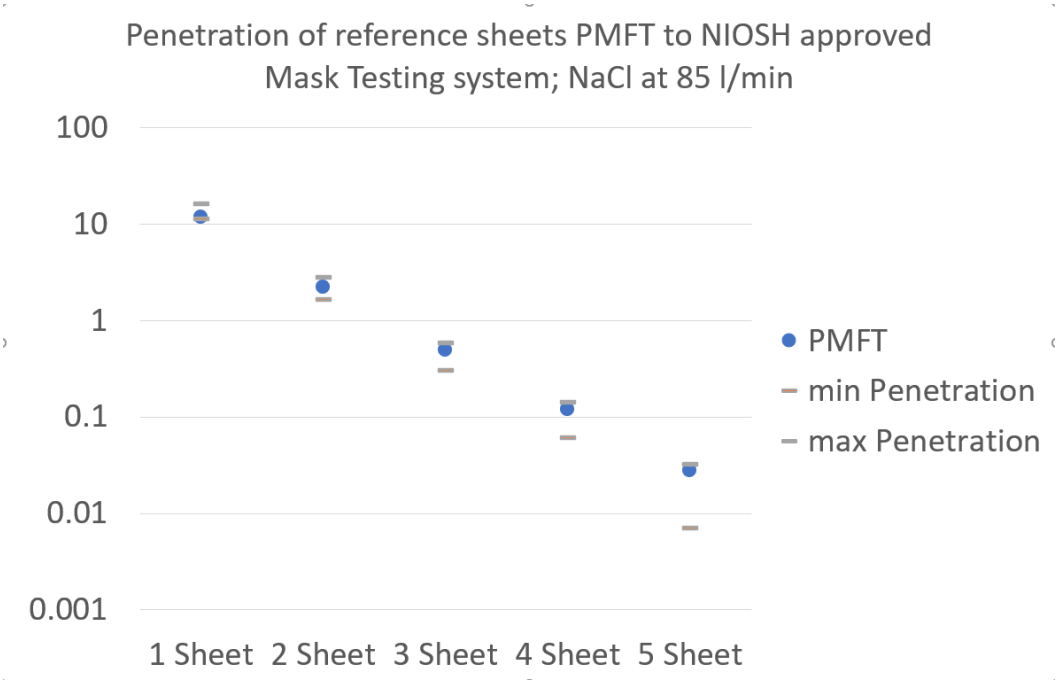
Mask ID	14087_20210426_124205
Mask los	
Mask type	FFP2 / x / x

Result

	EN149 min	EN149 max	PMFT	DMT	MF1	MF2
Penetration [%]	1.27	3.24	2.49	1.30	3.26	4.75
Based on X_g [µm]	0.45	0.29	0.29	0.29	0.185	0.13
Based on Sigma	2.2	1.6	1.85	1.85	2	1.9
Rating	P_Ph_45	P_Ph_45	P_Ph_45	P_m	P_Ph_45	P_Ph_45

exit

Compared with other standards (42CFR84/NIOSH) is also easy with the 42CFR84 upgrade KIT.



Extensions/Accessories

Aerosol generators

The PMFT 1000 has aerosol generators for measuring penetration with oil and salt. Measurement procedures for quick quality control (short test) or testing according to standard (exposure test) are supplied.

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

Software extension

Display of penetration results of the entire tolerance range of the size distribution according to EN 13274-7

- Allows the comparison of different test institutes and test systems

	EN 149	EN 13274-7	EN 13274-7	GB 2626	GB 2626	42CFR 84	42 CFR 84
Aerosol	see EN 13274-7	NaCl	PaO	NaCl	PaO/DOP	NaCl	DOP
Mean diameter	see EN 13274-7	0.06 – 0.1 μm	0.29 – 0.45 μm	0.055 – 0.095 μm	0.165 – 0.205 μm	0.055 – 0.095 μm	0.165 – 0.205 μm
Standard deviation	see EN 13274-7	2 – 3	1.6 – 2.2	< 1.86 (by additional software module)	< 1.6 (by additional software module)	< 1.86 (by additional software module)	< 1.6 (by additional software module)
Concentration	see EN 13274-7	4 –12 mg/m³	15 – 25 mg/m³	< 200 mg/m³	(50 mg/m³) < 200 mg/m³	< 200 mg/m³	< 200 mg/m³
Discharge	-	-	-	required	required	required	required
Air flow	see EN 13274-7	95 l/min	95 l/min	85 ± 4 l/min	85 ± 4 l/min	85 ± 4 l/min	85 ± 4 l/min
Temperature	see EN 13274-7	22 ± 3 °C	-	25 ± 5 °C	25 ± 5 °C	25 ± 5 °C	25 ± 5 °C
Rel. humidity	see EN 13274-7	< 40 %	-	20 – 40 % (by compressed air)	-	20 – 40 % (by compressed air)	20 – 40 % (by compressed air)
Measurement device	see EN 13274-7	Sodium flame photometer	Light scattering photometer	particle detector	particle detector	Light scattering photometer	Light scattering photometer
Measuring time	see EN 13274-7	30 s	30 s	lowest eff. during loading	lowest eff. during loading	lowest eff. during loading	lowest eff. during loading
Pause time	see EN 13274-7	180 s	180 s	lowest eff. during loading	lowest eff. during loading	lowest eff. during loading	lowest eff. during loading
Exposition	120 mg	120 mg	120 mg	200 ± 5 mg	200 ± 5 mg	200 ± 5 mg	200 ± 5 mg
PMFT remarks	O.K.	O.K.	O.K.	O.K. with upgrade KIT	O.K. with upgrade KIT	O.K. with upgrade KIT	O.K. with upgrade KIT

Table 2: Overview of standards for face mask penetration testing

- Facilitates certification
- Shows wide range of standards. Depending on the test operation – i.e., particle size distribution of the test aerosol – one and the same mask can perform very well or fail the test

BENEFITS

- Test rig working principle better than EN 149 and EN 13274-7, equivalent to GB 2626, 42 CFR 84 and ASTM 2299-3 by additional software option
- Test of community masks equivalent to CWA 17553
- Includes two aerosol generators for oil and NaCl
- Testing of fractional efficiency, e.g., efficiency in whole size range of 100 nm up to 3 μm
- Exact analysis of filter and filter mask efficiency for SARS-CoV-2 (size approx. 120 nm up to 160 nm) in the size range between 100 nm and 180 nm we have eight size channels
- Future-proof: Works with any kind of aerosol without adjustments
- Further measurement of differential pressure, e. g., as well within different face velocities to simulate measurement of breath resistance
- Face velocity adjustable between 1.5 – 70 cm/s
- Product capable of fast quality assurance **and** continuous optimization in R&D (display of size distribution)
- Individual face mask adapter for your product

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)	0.12 – 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

- Development and production monitoring of half masks
- Test of total penetration for respiratory masks
- Exact analysis of filter mask efficiency for e.g., Coronavirus

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