



## ISO 16890 New Standard for Classifying Air Filters



For over 20 years EN779 has been the most used standard for classifying air filters for coarse and fine dust particles.

Under EN779, the efficiency of an air filter was assessed as an average value calculated by means of loading steps with a synthetic laboratory dust. However, this only involved a particle size of 0.4 microns.

In practice, however, a much wider range of particle sizes is involved and the development of efficiency in terms of capturing atmospheric dust tends to be more flat or slightly gradual.

With the introduction of the new ISO 16890 standard, filter separation efficiency is evaluated in the laboratory without dust loading. Instead of taking only the 0.4 micron particle size into account, ISO 16890 assesses a wide

spectrum of particle sizes between 0.3 and 10 microns. This allows the degree of separation for the fine dust fractions PM10, PM2.5 and PM1 to be determined.

The separation degrees ePM1 for the particle size range up to 1 micron, ePM2.5 for the particle size range up to 2.5 microns and ePM10 for the particle size range up to 10 microns are calculated from measured separation curves. The “e” stands for efficiency. The efficiency is rounded in 5% increments.

Based on the separation levels described, filters are divided into four groups. The prerequisite for each respective group is that a filter separates at least 50% of the corresponding particle size range.

ISO 16890	Group classification	Type of particulate matter
ISO ePM 1	e(PM1), min ≥50%	Viruses, nanoparticles, exhaust gases
ISO ePM 2.5	e(PM2.5), min ≥50%	Bacteria, combustion particles, toner dust
ISO ePM 10	e(PM10), ≥50%	Pollens, fine dust, mold
ISO Coarse	e(PM10), <50%	Sand, hair

### FILT AIR Ltd.

- Fine Dust Filter
- Final Filter for Fan Filter Units
- Final Filter for Clean Rooms
- Final Filter for Channel Installation
- Highly Active Filter Surface - Low Pressure Drop
- Final Filter for Grid Systems

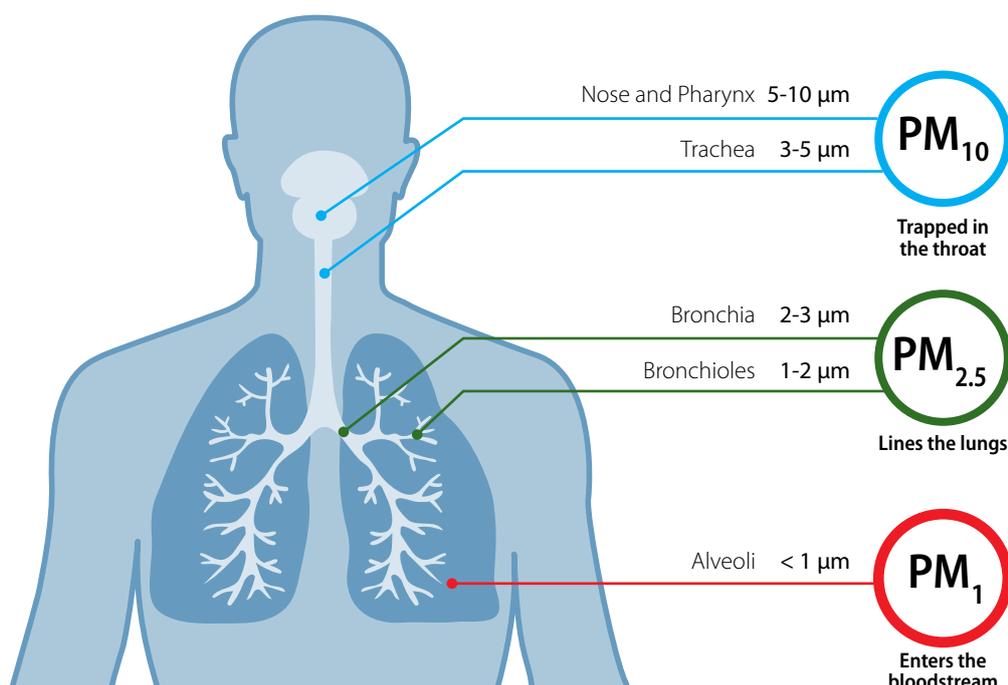
## Comparison of the EN 779 vs ISO16890 Standard

In the EN 779 standard, the efficiency towards coarse and fine powders was based on particles with an aerodynamic diameter of 0,4  $\mu\text{m}$ .

In the ISO 16890, the efficiency is defined on the basis of particulate having different diameters: PM10, PM2,5 and PM1.

EN 779: 2012		ISO 16890
Particle size for classification	0,4 $\mu\text{m}$	0.3 to 1 $\mu\text{m}$ (PM1)
		0.3 to 2.5 $\mu\text{m}$ (PM2.5)
		0.3 to 10 $\mu\text{m}$ (PM10)
Test aerosol	DEHS	DEHS for 0.3 to 1 $\mu\text{m}$
		KCL(Potassium chloride) for 1 $\mu\text{m}$ to 10 $\mu\text{m}$
Electrostatic discharge with IPA (Isopropanol)	Sample of filter is fully immersed	Entire filter is conditioned with IPA vapour
Efficiency of discharged filter	Comparison of sample and entire filter	Average efficiency of treated and untreated (conditioned) filter
Dust feed for classification	Incremental dust feed	Classification without dust feed
Test dust for ISO Coarse and energy efficiency	ASHRAE	ISO A2 Fine
Dust feed	70 mg/m <sup>3</sup>	140 mg/m <sup>3</sup>
Test final differential pressure	G1, G2, G3, G4 = 250 Pa	PM 10 < 50% = 200 Pa
	M5, M6, F7, F8, F9 = 450 Pa	PM 10 $\geq$ 50% = 300 Pa

## The Affects of Particles in the Human Body



### FILT AIR Ltd.

Member of the Beth-El Group

Main Office: P.O. Box 166  
Zikhron Yaaqov, 3095101, Israel

Tel: + 972-4-610 7777

Fax: + 972-4-635 0396

info@filt-air.com

www.filt-air.com