ISO16890 - Air Filters for general ventilation

ISO 16890 (all parts) refers to particulate air filter elements for general ventilation having an ePM_1 efficiency less than or equal to 99 % and an ePM_{10} efficiency greater than 20 % when tested per the procedures defined within parts 1-4 of ISO 16890.

EN779:2012 classify air filters due to the efficiency of 0,4 µm particle size. The new standard ISO16890 the filters classifies according to efficiency of particle size fractions , (PM10), (PM2,5) and (PM1).

EN779: 2012 - test

Particle size 0,4 µm by classification.

Dust feeding and particle efficiency measure in steps up to 450 Pa final pressure drop
⇒ Average efficiency ex. 85%

No relation to real environment.

Discharging by a piece of filtermedia in IPA-liquid (Isopropanol). Class F7 – F9

Minimum Efficiency (ME) defines the filter in classes F7 – F9. Ex.: ≥ 35% is class F7

Test dust: ASHRAE

Air flow rate: 3400 m^3/h (0.944 m^3/s)

ISO16890 - test

ePMx – efficiency of particle fraction with a diameter ≥ 0,3 µm and x µm

Efficiency	Size range, µm
ePM_{10}	$0,3 \le x \le 10$
$ePM_{2,5}$	$0,3 \le x \le 2,5$
ePM_1	$0,3 \le x \le 1$

Average efficiency = average value of initial efficiency and discharged (conditioned) efficiency. Final pressure drop: 200 Pa (Coarse), and 300Pa (Pm_x). More equal to real environment.

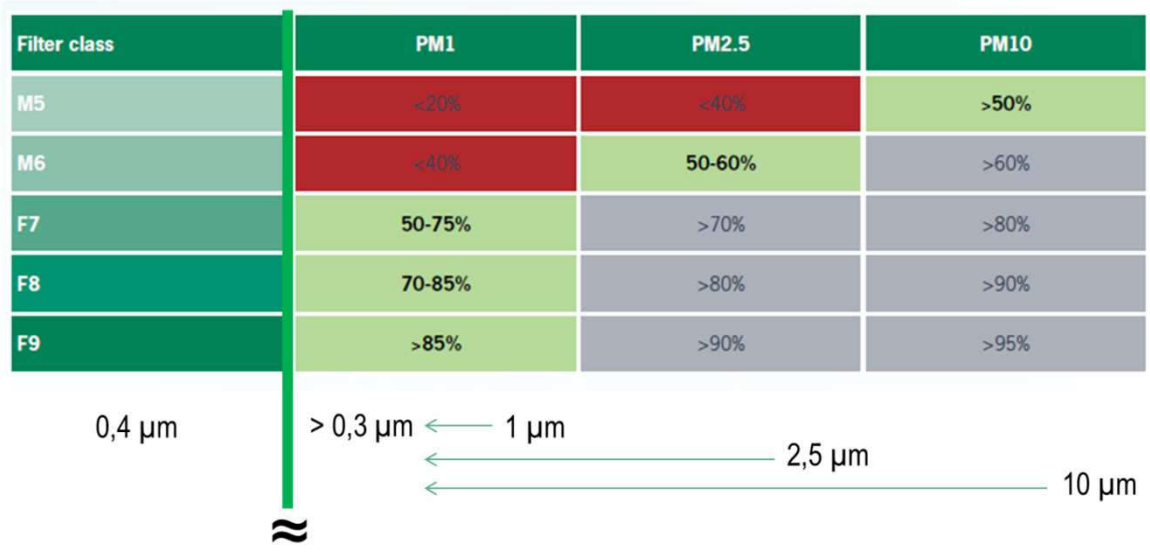
Discharge of a complete filter in IPA-vapor

Test dust: ISO A2 / AC Fine (≈ double dust holding)

Air flow rate: 3400 m^3/h (0.944 m^3/s)

Filter classes EN779 vers. ISO16890

Filter class	PM1	PM2.5	PM10
M5	<20%	<40%	>50%
M6	<40%	50-60%	>60%
F7	50-75%	>70%	>80%
F8	70-85%	>80%	>90%
F9	>85%	>90%	>95%



Filter classes - ISO16890

Group designation	Requirement			Class reporting value
	$ePM_{1,\ min}$	$ePM_{2,5,\ min}$	ePM_{10}	
ISO Coarse	—	—	< 50%	Initial grav. arrestance
ISO *e*PM10	—	—	≥ 50%	ePM_{10}
ISO *e*PM2,5	—	≥ 50%	—	$ePM_{2,5}$
ISO *e*PM1	≥ 50%	—	—	ePM_1

Filter ePM1 and ePM2,5 with initial / discharged efficiency below 50% becomes one group worse.

PM1 classes	PM2,5 classes	PM10 classes	Coarse
ePM1[95%]	ePM2.5[95%]	ePM10[95%]	Arrestance
ePM1[90%]	ePM2.5[90%]	ePM10[90%]	In step of 5%
ePM1[85%]	ePM2.5[85%]	ePM10[85%]	
ePM1[80%]	ePM2.5[80%]	ePM10[80%]	
ePM1[75%]	ePM2.5[75%]	ePM10[75%]	
ePM1[70%]	ePM2.5[70%]	ePM10[70%]	
ePM1[65%]	ePM2.5[65%]	ePM10[65%]	Ex:
ePM1[60%]	ePM2.5[60%]	ePM10[60%]	ISO Coarse 60%
ePM1[55%]	ePM2.5[55%]	ePM10[55%]	
ePM1[50%]	ePM2.5[50%]	ePM10[50%]	
Demand: >50% initial eff. >50% discharged eff.	**Demand :** >50% initial eff. >50% discharged eff.	**Demand :** >50% initial eff. No demand of minimum eff. (ME)	**Demand :** No discharge.

Always round down to nearest lower 5% -unit point.