

ISO 16890

Air filters for general ventilation

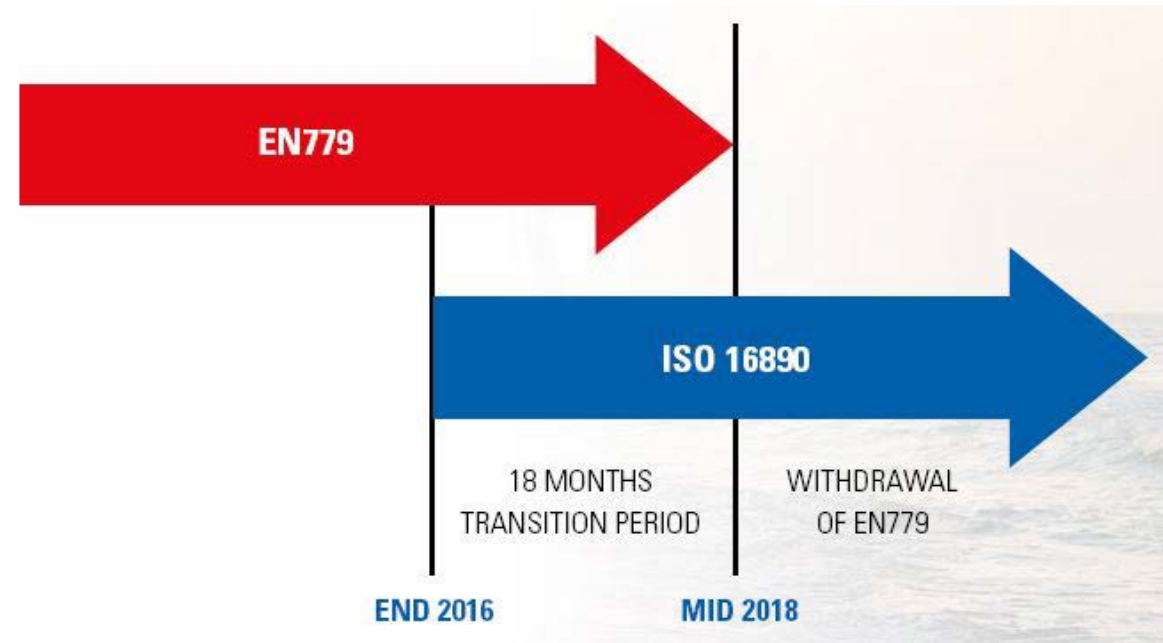
MBM 2018 – 15. & 16. May 2018



ISO 16890 is a new test method for air filters

- Valid since August 2017
- Replaces EN 779 by July 2018 fully

TIMING OF ISO 16890



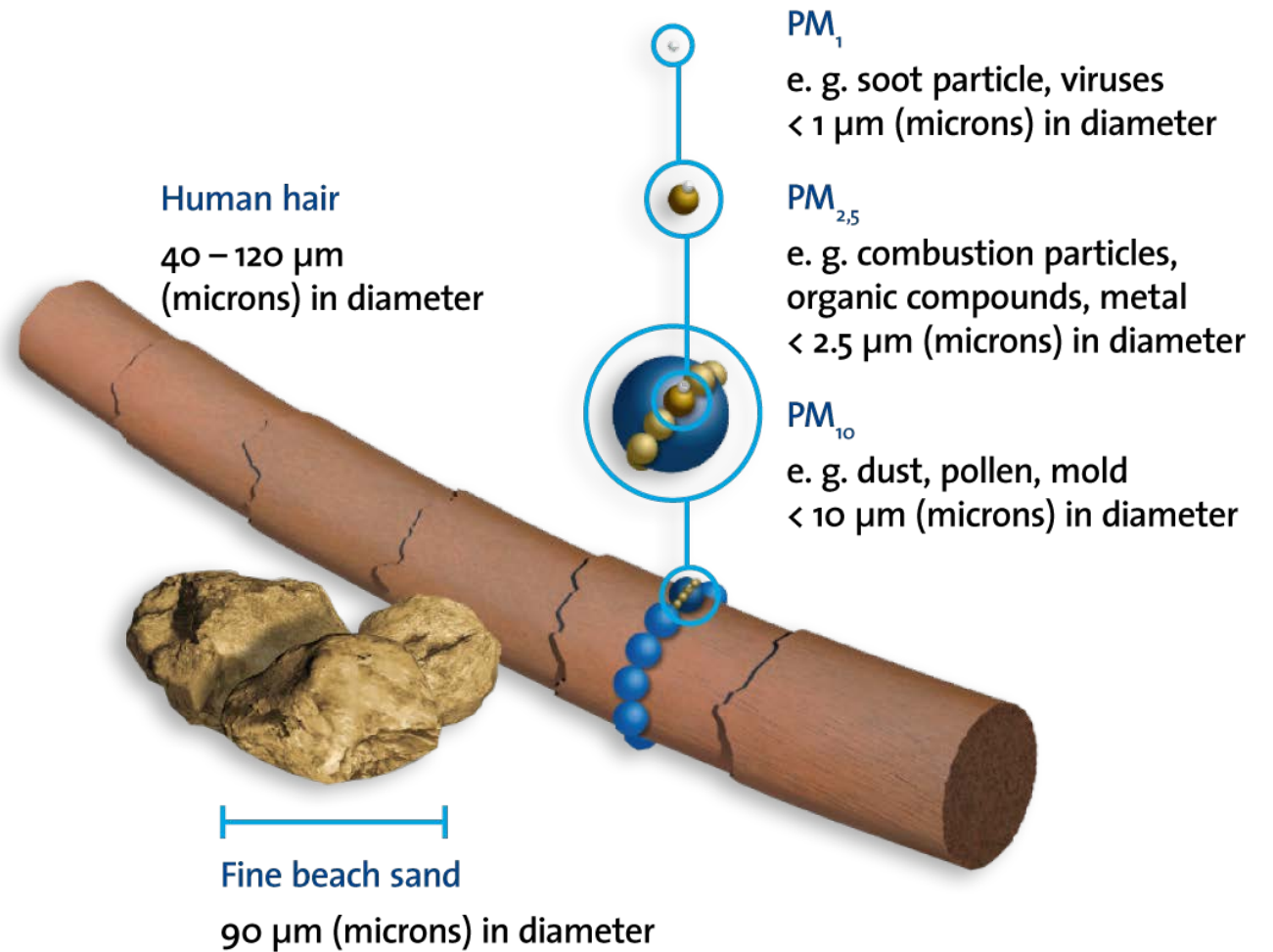
EN 779 defines 9 classes for coarse, medium and fine filters

- Principle of the test method was set up in the 1960s
- Filtration quality is measured by using **one test aerosol** with **0,4 μm**

Filter Class	Average arrestance A_m	Average efficiency E_m	Minimum efficiency E_{min}
acc. to EN 779	(synthetic dust)	(DEHS-Aerosol @ 0,4 μm)	(DEHS-Aerosol @ 0,4 μm) after IPA treatment
G1	$A_m < 65\%$	—	—
G2	$65\% \leq A_m < 80\%$	—	—
G3	$80\% \leq A_m < 90\%$	—	—
G4	$90\% \leq A_m$	—	—
M5	—	$40\% \leq E_m < 60\%$	—
M6	—	$60\% \leq E_m < 80\%$	—
F7	—	$80\% \leq E_m < 90\%$	$35\% \leq E_{min}$
F8	—	$90\% \leq E_m < 95\%$	$55\% \leq E_{min}$
F9	—	$95\% \leq E_m$	$70\% \leq E_{min}$

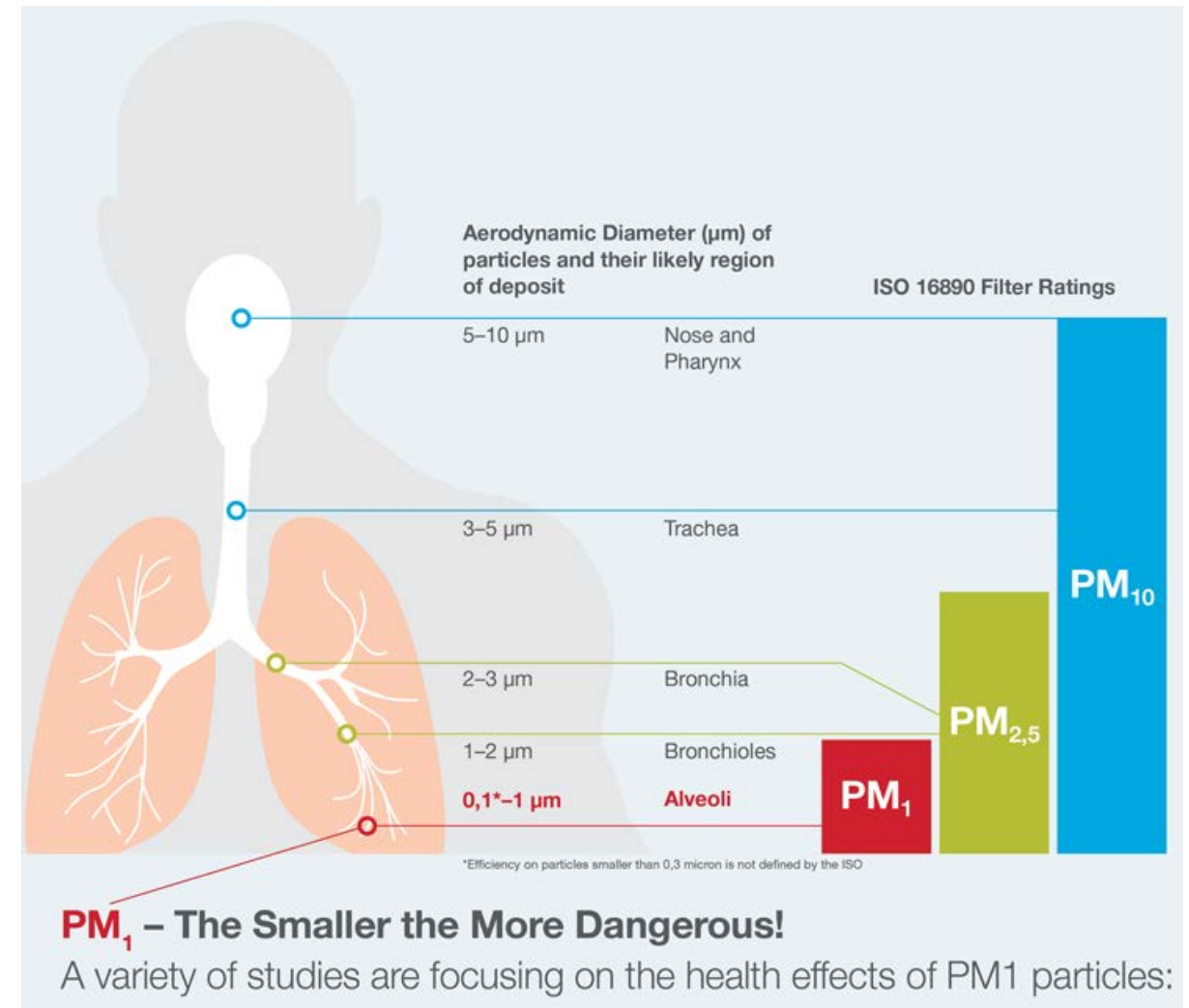
Why a new standard?

- Particulate Matter is divided into three particle sizes:
 - ePM10
 - ePM2.5
 - ePM1



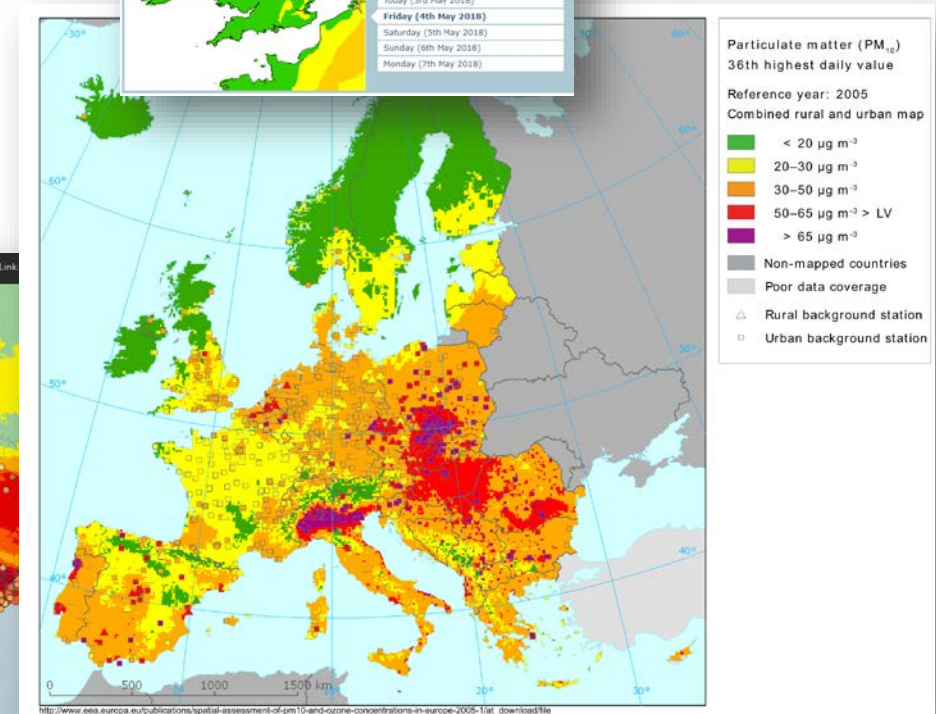
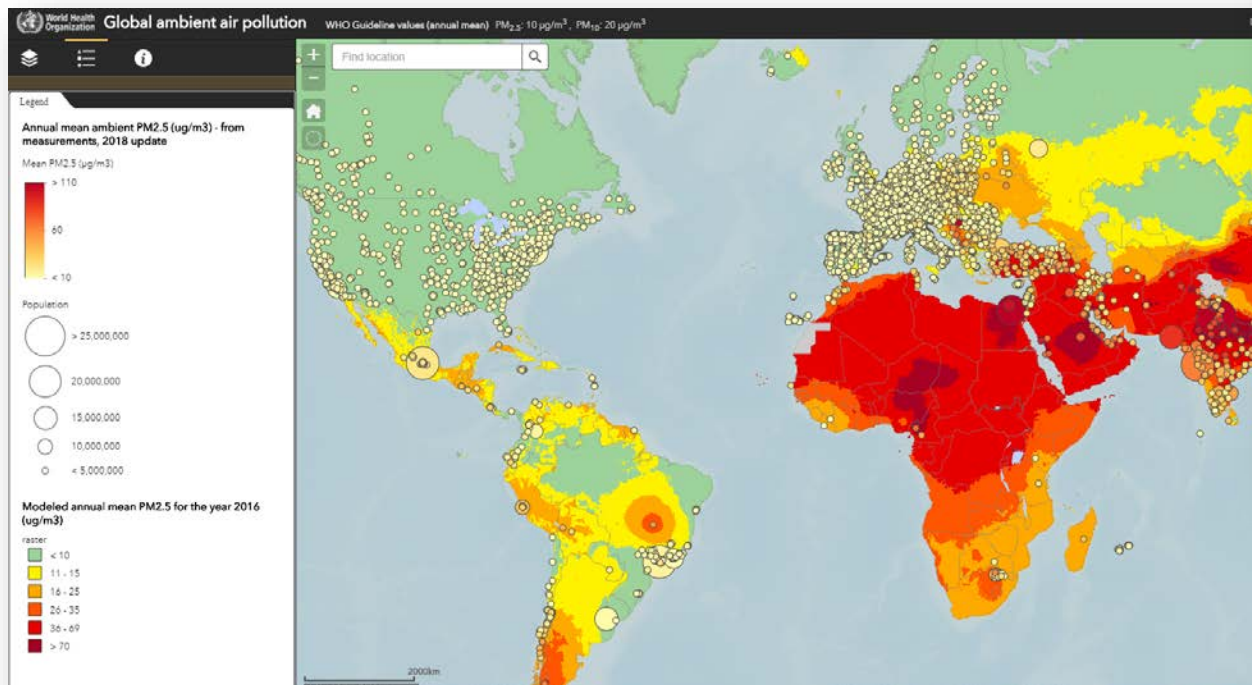
The different particles have different impacts on the human body

- PM1 particles are most dangerous
- Possible consequences:
 - Heart attack, lung cancer, dementia, emphysema, edema or other serious diseases



Air pollution available in several databases

- WHO
- Federal Environment Agency (DE, AT)
- Defra UK
- ... etc ...



The new standard classifies the filters in 4 groups

- Minimum efficiency is 50% to be classified per group
- Result is rounded off in 5% steps (50% ... 95%)
- In total 49 new “classes”

Coarse	< 50 % of PM10
ePM10	≥ 50 % of PM10
ePM2.5	≥ 50 % of PM2.5
ePM1	≥ 50 % of PM1

Comparison to EN 779

A 1-to-1 comparison is not possible, but there are similarities:

Classification table							
PM1		PM2,5		PM10		Coarse	
ISO ePM1 95%	F9	ISO ePM2,5 95%	F7	ISO ePM10 95%	M6	ISO Coarse 95%	G4
ISO ePM1 90%		ISO ePM2,5 90%		ISO ePM10 90%		ISO Coarse 90%	
ISO ePM1 85%		ISO ePM2,5 85%		ISO ePM10 85%		ISO Coarse 85%	
ISO ePM1 80%		ISO ePM2,5 80%		ISO ePM10 80%		ISO Coarse 80%	
ISO ePM1 75%	F8	ISO ePM2,5 75%	M6	ISO ePM10 75%	M5	ISO Coarse 75%	G3
ISO ePM1 70%		ISO ePM2,5 70%		ISO ePM10 70%		ISO Coarse 70%	
		ISO ePM2,5 65%		ISO ePM10 65%		ISO Coarse 65%	
ISO ePM1 65%	F7	ISO ePM2,5 60%	M6	ISO ePM10 60%	M5	ISO Coarse 60%	G2
ISO ePM1 60%		ISO ePM2,5 55%		ISO ePM10 55%		ISO Coarse 55%	
ISO ePM1 55%		ISO ePM2,5 50%		ISO ePM10 50%		ISO Coarse 50%	
ISO ePM1 50%						ISO Coarse 45%	
						ISO Coarse 40%	
						ISO Coarse 35%	
						ISO Coarse 30%	

Recommendations to minimum efficiency acc. to EVIA

Filter class EN 779	EVIA recommendation			
	ISO ePM ₁	ISO ePM _{2,5}	ISO ePM ₁₀	ISO Coarse
G2				≥ 30%
G3				≥ 45%
G4				≥ 60%
M5			≥ 50%	
M6		≥ 50%		
F7	≥ 50%			
F8	≥ 70%			
F9	≥ 80%			

Recommendations to minimum efficiency acc. to VDI 6022

Tabelle 4. Empfohlene Filterklassen (angelehnt an DIN EN 16798-3)

Außenluftqualität nach VDI 6022 Blatt 3 ^{a)}	ZUL 1 (sehr hoch)	ZUL 2 (hoch)	ZUL 3 (mittel)
AUL 1 (sauber)	ISO ePM10 50 % + ISO ePM1 50 %	ISO ePM1 50 %	ISO ePM1 50 %
AUL 2 (belastet)	ISO ePM2,5 65 % + ISO ePM1 50 %	ISO ePM10 50 % + ISO ePM1 50 %	ISO ePM10 50 % + ISO ePM1 50 %
AUL 3 (hoch belastet)	ISO ePM1 50 % + ISO ePM1 80 %	ISO ePM2,5 65 % + ISO ePM1 50 %	ISO ePM10 50 % + ISO ePM1 50 %

Our selection of filter qualities

New ISO 16890 Standard	Old EN 779 Standard
Coarse 30%	G2
Coarse 50%	G3
Coarse 60%	G4
ePM10 55%	M5
ePM1 60%	F7

Consequences on Ecodesign 1253/2014

- Initial pressure loss of filters is crucial for the SFP value
- Maximum air flow can change!
- Please remember this for all “older” projects in the future

