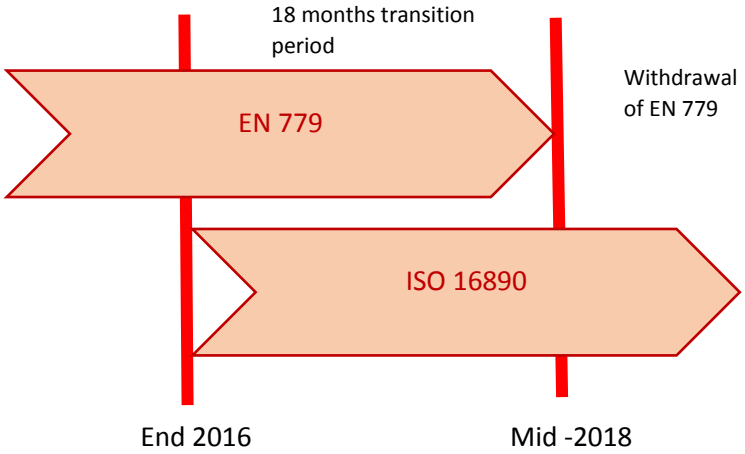
From EN779 to ISO 16890 Norm

What is happening? This ISO 16890 Norm is replacing EN 779?

The ISO 16890 is the new way to evaluate air filter. This standard is going to become the global normal for testing and classifying air filter and hence replace the previous EN 779:2012 norm (fine dust filter).

The documents regarding the "ISO 16890 Test standard" for air filters will be published towards the end of 2016. From this point until the following 18 month the EN 779:2012 test standard will be phased out and replaced by the new standard.



What does it change?

The ISO 16890 has a significant impact on the method the air filters will be selected. Unlike in the EN 779:2012 the ISO 16890 focuses on **the classes of particulate matter size (PM)** (see definition1) instead of filtration performance. Making this a more practical and realistic test criteria than the theoretical EN 779.

Definition 1:
Particulate matter also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets that get into the air. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.

Therefore with the new ISO 16890 standard filter efficiencies will be determined based on **particulate matter size** classes PM1, PM2.5 and PM10, which are correlated to the evaluation parameters used by the WHO (World Health Organization) and other authorities. Based on these parameters it will be easier for users to select the right air filter based on their field applications.

Concretely: A new classification method

The ISO16890 standard shares air filters, **fine dust filters and coarse dust filters** into four categories (Table 1). A precondition for each set is that a filter captures at least 50% of the appropriate particle size range. So if a filter, for instance, intercepts more than 50% of PM1 particles, it will be labelled as an ISO ePM1 filter. Then the effective efficiency of our filter will be reported and rounded in 5 % and this will be recorded incrementally to the closest increments. (See example 1)

Definition 2:
PM1, PM2.5 or PM 10 means all Particulate matter with size smaller than respectively 1, 2.5 or 10 microns.
Reminder
1µ = 0.001 mm; 2.5 µ = 0.0025 mm; 10µ = 0.01 mm

It implies that with the new ISO16890 standard, real working conditions will be considerate more successfully. Instead of taking into account merely the efficiency of a filter to intercept particle size of 0.4 microns such as in the EN779:2012, a wide range between 0.3 microns and 10 microns is used to define efficiencies regarding particulate matter fractions PM10, PM2,5 and PM1 (ISO 16890) of a given filter.

Classes	Minimum Efficicency	Type of particulate matter
ISO ePM1	e(PM1),min ≥ 50 %	Viruses, nanoparticles, exhaust gasses
ISO ePM2.5	e(PM2.5),min ≥ 50 %	Bacteria, fungal and mold spores, pollen, toner dust
ISO ePM10	e(PM10),min ≥ 50 %	Pollen, desert dust
ISO coarse	e(PM10),min ≤50 %	Sand, hair

Table 1 : Particulate matter size classification

In order to be rated according PM1, PM2.5 or any of the other PM sizes classes, an air filter will need to prove a minimum efficiency of 50% regarding the concerned class. So with this norm a filter can have until four classes of efficiency if it perform at least 50 % in the PM(n) category (Table 2)

Example 1:
an air filter performing at 74% to PM1 particles is rated at ePM1 75%.
an air filter performing at 72% to PM1 particles is rated at ePM1 70%.

Finally for **coarse filters** the new standard will include **filters that capture less than 50% of particles in the PM10 range** –these will be known as "ISO Coarse" and will detail their PM10 performance i.e. "PM Coarse 45%".

Class	ISO ePM1	ISO ePM2.5	ISO ePM10	ISO Coarse
G3	-	-	-	>80 %
G4	-	-	-	>90 %
M5	-	-	>50 %	-
M6	-	50- 65 %	>60 %	-
F7	50- 65 %	65 – 80 %	>85 %	-
F8	65 – 80 %	>80 %	>90 %	-
F9	>80 %	>95 %	>95 %	-

The efficiencies in this table are expected value for these filters. They can deviate depending of the supplier and the type of technology used.
Table 2 : efficiencies of fine dust filter and coarse filter

To summarize

- What is happening?
  - A new norm is coming the ISO 16890
  - EN779:2012 will be replaced by this norm
  - An 18 month transition period starting the end of 2016
- What does it change?
  - A new way to classify fine dust filters and coarse filters is introduce
  - the filters are being sorted regarding their abilities to intercept a wide spectrum of particulate matter size starting from 0.3µ
- What can be the possible advantages?
  - Filters will be more adapted to real condition of the desired application
  - Easier to relate and to correlate to international organization such as WHO (World Health organization) due to same nomenclature
- What can be the possible drawbacks?
  - An 18 month transition period where two norms will be applicable
  - To adapt to new way of selection the air filter