

EVIA FAQ on ISO 16890 – Filter Classes

Version 1: 10th July 2017 Final draft Claus Händel

Objective:

Filters are essential elements in ventilation system to ensure good Indoor Air Quality and hygiene operation. With the new ISO 16890 (2016-12) the filter test and qualification procedure has been changed to a more realistic classification based on ePM₁, ePM_{2,5}, and ePM₁₀ values. This allows a detailed filter selection based on outdoor particular matter.

However most of the existing standards (EN 16798-3 etc.) and regulation for applications are based on EN 779 filter classes (G3 to F9). It is expected that all the existing application standards will be changed within the next years, but a simple one to one relation might not be possible. A detailed requirement for the filter classes must be developed in each application standard.

This will be a process over years. Filter and ventilation unit manufacturer need a simplified method, which allows a quick decision, which new filter class will be an option for EN 779 replacement.

The following table gives an orientation but will not replace individual selections and determinations in real application. EVIA will replace this recommendation as soon as a new status of investigation is available.

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%			

ISO ePM₁ the particle size distribution is a range from 0,3 - 1 Micron as found in an urban environment
 ISO ePM_{2,5} the particle size distribution is a range from 0,3 - 2,5 Micron as found in an urban environment
 ISO ePM₁₀ the particle size distribution is a range from 0,3-10 Micron as found in a rural environment
 ISO Coarse Arizona test dust contaminants A2 Fine Grade 0,97 - 176 Micron

- [1] EN 779:2012-10 – EN 779 :Particulate air filters for general ventilation. Determination of the filtration performance
- [2] ISO 16890-1:2016-12 – Air filters for general ventilation —Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM)
- [3] FGK Status-Report 44 and
 VDI <https://www.vdi.de/presse/artikel/neue-filter-fuer-die-raumluft-technik/>

Question and answers on filtration in ventilation units:

1 How to classify filters according EU 1253/2014 in ventilation units?

The definition in EU 1253/2014 does not refer direct to ISO 16890 or EN 779. However the definitions given in Annex IX are based on EN 779. Fine filter means therefore class F7 and medium filter M5. For declaration of CE-Conformity the following options might be used.

- Filters according definition EN 1253/2014 shall be used and tested and classified according ISO 16890. The resulting ISO classes shall be reported.
- Filters according this recommendation shall be used.

2 How to specify filters for different air volume flows and average air velocity in ventilation units?

The efficiency of the filter should be measured at the nominal air volume of the installation the filter is intended for.

3 Is the filter classification valid in applications with changing flow directions (clean side to dust side)?

No. There are two problems in this case. First, the efficiency might be different - depending on the media type that is used - with changing flow directions. This could be tested along ISO16890 (so filter tested with flow from both directions). Second, how to consider the particulate matter that might be released by the filter when the flow will come from the opposite direction.

About EVIA:

The European Ventilation Industry Association (EVIA) was established in Brussels in July 2010. EVIA's mission is to represent the views and interests of the ventilation industry and serve as a platform between all the relevant European stakeholders involved in the ventilation sector, such as decision-makers at the EU level as well as our partners in EU Member States.

Our membership is composed of more than 35 member companies and 6 national associations across Europe, realising an annual turnover of over 7 billion euros and employing more than 45,000 people in Europe.

EVIA aims to promote highly energy efficient ventilation applications across Europe, with high consideration for health and comfort aspects. Fresh and good indoor air quality is a critical element of comfort and contributes to keeping people healthy in buildings.

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