



RS 4/C/001- 2018

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**RATING STANDARD
for the
CERTIFICATION
of
AIR FILTERS**

RS 4/C/001- 2018

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Nb	Modifications	Section	Page
1	<i>Tolerance for the ISO rating is added</i>	VI	5
2	<i>In 2018 all sampled filters will be tested according to both standards</i>	IV	5
3	<i>Replacement of ISO16890:XXXX by ISO16890:2016</i>	VARIOUS	
4	<i>Editorial revisions</i>	VARIOUS	

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I. PURPOSE

The purpose of this Rating Standard is to prescribe rating procedures to be used in the Eurovent Certified Performance Programme for Air Filters in accordance with the Operational Manual OM-11.

II. SCOPE

This Programme applies to air filter elements rated and sold as “medium and fine filters M5, M6, F7 – F9” as defined in the respective valid version of EN 779:2012 and ISO 16890:2016.

III. DEFINITIONS

Air Filter Element: A filter unit to clean air from particulate contamination comprising filter material including framing, supporting parts and gaskets, the total to be inserted into a filter housing device.

Performance Data: Single values out of the filter test report as carried out in accordance with EN 779:2012 or ISO16890:2016.

Filter family: A filter family is characterised by the following:

- the same filter material
- the same basic construction (e.g. bag, V-type, etc.)
- the same face velocity : rated air-flow / min. net filter area; (does not have to be published). The airflow rate shall be adapted to the face area with a tolerance of +/- 10%.
- The same length/depth of the overall filter element with a tolerance of +/- 10% or 50 mm whatever is the smaller
- For Bag and V-Type filters, the same ratio of filter medium area to front face area with a tolerance of +/- 10%.
- Same initial pressure drop with a tolerance of +/- 10%.
- the same filter class M5, M6, F7, F8 or F9
- *the same ISO rating*
- published data available about: basic construction, filter media, filter class available via internet or other published sales brochures.

Representative Filter Element: Any type chosen by Eurovent Certita Certification out of a “filter” fitting into the EN 779:2012 – test rig.

F-Filter Class: Class of fine (group “F”) air filters based on classification according to EN 779:2012 (F7, F8 or F9).

M-Filter Class: Class of medium (group “M”) air filters based on classification according to EN 779:2012 (M5, M6).

Filter depth: overall depth of the filter including the frame (complete filter). The Filter Depth defined here (and declared in the declaration file) is not the one used to calculate the filtering area.

Initial Pressure Drop: Pressure drop of the clean filter operating at the test air flow rate.

Initial Efficiency: Efficiency of the clean filter operating at the test air flow rate.

Discharged Efficiency: Discharged efficiency of media at 0.4 µm according to EN 779:2012 clause 11.

Minimum Efficiency: Lowest efficiency among the discharged efficiency, initial efficiency and the lowest efficiency throughout the loading procedure of the test – Note: Minimum efficiency is used for the classification of F-filters (see definition in EN779:2012).

Eurovent Energy Efficiency Class: Energy Efficiency class as defined in – Appendix A.

Annual Energy Consumption: Estimated Electricity Consumption per year due to an air filter as defined in Eurovent Document 4/21 - 2014 (kWh/annum).

ISO rating: Filter class according to ISO 16890:2016 (e.g. ISO ePM₁ 65%)

IV. TESTING REQUIREMENTS

Verification of performance characteristics shall be carried out in accordance with:

- European Standard EN 779:2012: “Particulate air filters for general ventilation - Determination of filtration performance” for Filter Class, initial pressure drop, initial efficiency and minimum efficiency;
- Eurovent Document 4/21 - 2014: “Calculation method for the energy use related to air filters in general ventilation systems”

All independent laboratories have to use the same test dust producer for a given test campaign. Before each test campaign independent laboratories will inform the participants on which test dust producer will be used. Applicant (participant not yet certified) can request from Eurovent Certita Certification information on the test dust producer used during the previous test campaign.

All tests shall be done with a temperature of 23 °C +/- 5 K and a relative humidity of 45% +/- 10 %.

Note: In 2018, all selected filters shall be tested according to both EN 779:2012 and ISO 16890:2016. See Operational Manual OM-11-2017 §IV.2.c for more details. The testing of all filters shall be based on dust from the same source.

V. CERTIFIED CHARACTERISTICS

The following performance characteristics shall be certified:

- Filter class: M5, M6, F7 to F9
- Initial pressure drop Δp_0 in Pa, measured according to EN 779:2012
- Initial Efficiency according to EN 779:2012 (for F7 to F9 filters only)
- Minimum Efficiency according to EN 779:2012 clause 11 (for F7 to F9 filters only)
- Eurovent Energy Efficiency Class according to Appendix A (for filters rated at 0.944 m³/s only) is calculated from the annual energy consumption
- Annual Energy Consumption according to Eurovent Document 4/21 - 2014 (for filters rated at 0.944 m³/s only)

Note: If a filter rated F7, F8 or F9 is measured in a filter class lower than F7, the discharged efficiency test shall be performed (unless the manufacturer asks to not test the discharged efficiency according to OM-11 §IV.3.c in case of a first test).

VI. TOLERANCES

For the test to be acceptable, the depth of the pockets (for bag and V-Type filters) shall not differ from the claimed value by more than:

- +/- 10 mm

When tested in the independent laboratory, the obtained results shall not differ from the claimed values by more than:

- For the filter class: as claimed or higher
- For the initial pressure drop: $+(10\%+Mt)$ or $+(10 \text{ Pa} + Mt)$ whichever largest where $Mt = 5\text{Pa}$ (measuring tolerance as allowed by EN 779:2012)
- For initial efficiency and minimum efficiency: -10%-point

The measured value shall be higher or equal to the minimum efficiency of the declared filter class as defined in EN 779:2012.

- For the annual energy consumption: $+10\%+ 60 \text{ kWh/y}$
- *For the ISO rating: -10%-point, same ISO group*

Table 1: Examples of result treatment for the minimum efficiency (the same principles apply to the result treatment of the initial efficiency)

Declared filter class	Declared minimum efficiency (%-point)	Measured minimum efficiency (%-point)	Deviation (%-point)	Result	Rerated minimum efficiency (%-point)	Comment
F7	50	45	-5	Passed	-	The deviation is lower than the tolerance and the measured value corresponds to the declared filter class.
F7	50	38	-12	Failed	38	The deviation is higher than the tolerance unless the measured value corresponds to the declared filter class.
F7	40	32	-8	Failed	32	The deviation is lower than the tolerance however the measured value doesn't correspond to the declared filter class.
F7	40	27	-13	Failed	27	The deviation is higher than the tolerance and the measured value doesn't correspond to the declared filter class

APPENDIX A. ENERGY EFFICIENCY CLASSIFICATION AND LABELLING

A.I. Definition of the energy efficiency classes

The Annual Energy Consumption calculated using the method described in Eurovent Document 4/21 - 2014 shall be compared to the class limits defined in the table below for the different energy efficiency classes to classify the filter under concern, depending of its filter class to EN 779:2012.

Table 2: Energy efficiency class limits for each filter class according to EN 779:2012 measured at 0.944 m³/s.

Filter class		M5	M6
ME		--	--
		$M_M = 250 \text{ g ASHRAE}$	
A+		0 – 450 kWh	0 – 550 kWh
A		> 450 kWh – 600 kWh	> 550 kWh – 650 kWh
B		> 600 kWh – 700 kWh	> 650 kWh – 800 kWh
C		> 700 kWh – 950 kWh	> 800 kWh – 1100 kWh
D		> 950 kWh – 1200 kWh	> 1100 kWh – 1400 kWh
E		> 1200 kWh	> 1400 kWh
Filter class	F7	F8	F9
ME	ME \geq 35%	ME \geq 55%	ME \geq 70%
		$M_F = 100 \text{ g ASHRAE}$	
A+	0 – 800 kWh	0 – 1000 kWh	0 – 1250 kWh
A	> 800 kWh – 950 kWh	> 1000 kWh – 1200 kWh	> 1250 kWh – 1450 kWh
B	> 950 kWh – 1200 kWh	> 1200 kWh – 1500 kWh	> 1450 kWh – 1900 kWh
C	> 1200 kWh – 1700 kWh	> 1500 kWh – 2000 kWh	> 1900 kWh – 2600 kWh
D	> 1700 kWh – 2200 kWh	> 2000 kWh – 3000 kWh	> 2600 kWh – 4000 kWh
E	> 2200 kWh	> 3000 kWh	> 4000 kWh