



TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK



AIR FILTERS

Identification: [ECP 11 FIL](#)

Revision 1 – [April 2020](#)

(This version cancels and replaces any previous versions)

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The purpose of these Technical Certification Rules is to prescribe procedures for the operation of the Eurovent Certified Performance (ECP) certification programme for Air Filters (FIL), in accordance with the Certification Manual.

Modifications as against last version:

| No. | Modifications | Section | Page |
|-----|---|-------------------|-----------|
| 1 | <i>Clarification of the scope and exclusion of all combination filters with active carbon</i> | <i>I.1</i> | <i>5</i> |
| 2 | <i>Modification of the sampling process</i> | <i>I.1.1.1a</i> | <i>14</i> |
| 3 | <i>Clarification for calibration report</i> | <i>III.1.1</i> | <i>12</i> |
| 4 | <i>For participant with MVF>10%:</i> <ul style="list-style-type: none"> - <i>a 2nd sampling must be done for the dedicated additional filters.</i> - <i>New rating requirement</i> | <i>III.1.3.3d</i> | <i>16</i> |
| 5 | <i>Clarification when new models need to be updated on declaration list</i> | <i>III.2.1</i> | <i>20</i> |
| 6 | <i>Removal of Appendix A: FORM FIL-1: SUBMITTAL FOR CERTIFICATION</i> | | |
| 7 | <i>Modification of the Campaign schedule</i> | <i>Appendix A</i> | <i>25</i> |

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TABLE OF CONTENTS

| | |
|--|-----------|
| I. GENERAL INFORMATION | 5 |
| I.1. Scope | 5 |
| I.2. Certified performances | 5 |
| I.3. Definitions | 6 |
| I.4. Contributors | 6 |
| II. REQUIREMENTS OF THE REFERENCE DOCUMENT | 8 |
| II.1. Reference documents | 8 |
| II.2. Specific requirements and quality management | 8 |
| II.3. Marking | 10 |
| III. CERTIFICATION PROCESS | 12 |
| III.1. Admission procedure | 12 |
| III.1.1. Declaration file | 12 |
| III.1.2. Admissibility of the application | 14 |
| III.1.3. Implementation of checking operations | 14 |
| III.2. Surveillance procedure | 20 |
| III.2.1. Implementation of surveillance operations | 20 |
| III.2.1.1 Surveillance audit | 20 |
| III.2.1.2 Selection of filters to be tested | 20 |
| III.2.1.3 Surveillance tests | 20 |
| III.2.1.4 software checking procedure | 21 |
| III.2.1.5 Desk study | 21 |
| III.2.1.6 Technical and commercial documentation check | 21 |
| III.2.1.7 Challenge procedure | 21 |
| III.2.2. Evaluation and decision | 21 |
| III.2.2.3 Repeated failures along the test campaigns | 22 |
| III.3. Declaration of modifications | 22 |
| III.3.1. Changes concerning the participant | 22 |
| III.3.2. Changes concerning production sites | 22 |
| III.3.3. Changes concerning the quality organisation of the manufacturing and/or marketing process | 22 |
| III.3.4. Changes concerning the declaration list (model and/or range) | 22 |
| III.3.5. Changes concerning the certified product | 23 |
| III.3.6. Temporary or permanent cessation of production of a certified product | 23 |
| III.4. Suspension/cessation conditions | 23 |
| APPENDIX A. CAMPAIGN SCHEDULE | 25 |
| APPENDIX B. CALCULATION METHOD AND IMPLEMENTATION OF MEAN VALUE OF FAILURE (MVF) | 26 |
| B.I. General | 26 |

| | |
|--|-----------|
| B.II. Newcomers and admission procedure | 26 |
| APPENDIX C. TEST RESULTS INTERPRETATION..... | 27 |
| C.I. All performances are within the tolerances | 27 |
| C.II. Some performances are out the tolerances | 27 |
| C.III. All performances are within the tolerances, however, the filter ISO class is different from the declaration | 27 |
| C.IV. All performances are within the tolerances, however, the ePMx group measured is better than in the declaration | 28 |

I. GENERAL INFORMATION

I.1. Scope

I.1.1. General

The purpose of these Technical Certification Rules (TCR) is to prescribe procedures for the Eurovent Certified Performance Programme for Air Filters.

Participation in this programme is open to:

- Original Equipment Manufacturers (OEM)
- Brand Name company (BN) selling products already certified by OEM

Random tests are conducted under this programme. These tests shall be conducted at the independent test facilities approved by Eurovent Certita Certification (ECC) and in accordance with this relevant Technical Certification Rules standard.

The programme scope covers Air Filter elements rated and sold as ISO ePM₁, ISO ePM_{2.5} and ISO ePM₁₀ according to EN ISO 16890-1:2016, referring to a front frame size of 592x592mm according to standard EN 15805:2010 and with a nominal airflow between 0.24 and 1.5 m³/s (including filter mats). When a company joins the program, all relevant ISO ePM₁, ISO ePM_{2.5} and ISO ePM₁₀ air filter elements shall be declared.

As manufacturers may produce a large number of filters with different length/depth there is an acceptance criteria for the declaration of filters belonging to the same filter family as already certified filters with the same nominal airflow and with different length/depth of the overall filter element within an acceptance criteria of +/- 10% or 50 mm (whatever is the smaller). Outside of this acceptance criteria the filters shall be declared.

The following filters are specifically excluded from the scope:

- ISO Coarse filters
- All combination filters with active carbon

I.1.2. Certify-all principle

Whenever a company participates in the programme for FIL, all filters that are promoted by the applicant/participant to end-users, specifiers, trading companies, contractors by means of paper or electronic catalogue, price list or software within the scope of the programme, shall be certified, in accordance with these Technical Certification Rules. This includes all models in modular ranges. For the FIL programme, the certify-all requirement as defined in the Certification Manual is applicable to the European market and the Turkish market (since 1st January 2019).

I.2. Certified performances

Certified performance items:

- Initial pressure drop Δp_0 in Pa, measured according to EN ISO 16890
- ePM₁, ePM_{1,min}, ePM_{2.5}, ePM_{2.5,min} and ePM₁₀ efficiencies measured according to EN ISO 16890
- Eurovent Energy Efficiency Class according to Appendix A is calculated from the annual energy consumption
- Annual Energy Consumption

I.3. Definitions

In addition to the definitions specified in the Certification Manual, the following definitions apply:

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 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 an acceptance criteria of +/- 10%.
 - The same length/depth of the overall filter element with an acceptance criteria 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 an acceptance criteria of +/- 10%.
 - Same initial pressure drop with an acceptance criteria of +/- 10%.
- The same ePM_x group
- The same ISO efficiency 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 ISO16890:2016 – test rig.

Particulate matter efficiency ePM_x: efficiency of an air cleaning device to reduce the mass concentration of particles with an optical diameter between 0,3 µm and x µm.

ePM_x group designation: designation of a group of filters fulfilling certain requirements in the filter classification (ISO ePM₁, ISO ePM_{2.5}, ISO ePM₁₀ and ISO Coarse)

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.

Minimum Efficiency: fractional efficiency after applying the conditioning method defined in EN ISO 16890-4:2016

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 - 2019 (*Eq. (1a)*, kWh/annum).

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

I.4. Contributors

The lists of contributors are given for information and may be modified by EUROVENT CERTITA CERTIFICATION whenever necessary.

I.4.1. Audit body

The audit functions are performed by the following body(ies), called audit body:

EUROVENT CERTITA CERTIFICATION SAS
48/50 rue de la Victoire
F- 75009 PARIS
Tel : + 33 1 75 44 71 71
www.eurovent-certification.com

I.4.2. Independent laboratory / test body

When the checks carried out involve product tests, these are performed at the request of EUROVENT CERTITA CERTIFICATION by the following laboratories, known as Independent laboratory:

CETIAT

*Domaine Scientifique de la Doua
54 avenue Niels Bohr
69100 VILLEURBANNE
FRANCE
Website: www.cetiat.fr*

Eurofins Expert Services Ltd

*Tekniikantie 15 A, Research Hall 1
FI 02150 ESPOO
FINLAND
Website: <http://www.eurofins.fi/expertservices>*

RISE Research Institutes of Sweden

*Division: Samhällsbyggnad / built environment
Industrigatan 4
SE-50462 Borås Sweden
Website: www.ri.se*

II. REQUIREMENTS OF THE REFERENCE DOCUMENT

II.1. Reference documents

II.1.1. Product and test standards

The applicable standards are as follow:

- European Standard EN ISO 16890-1:2016: “Air filters for general ventilation - Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM)”
- European Standard EN ISO 16890-2:2016: “Air filters for general ventilation - Part 2: Measurement of fractional efficiency and air flow resistance”
- European Standard EN ISO 16890-3:2016: “Air filters for general ventilation - Part 3: Determination of the gravimetric efficiency and the air flow resistance versus the mass of test dust captured”
- European Standard EN ISO 16890-4:2016: “Air filters for general ventilation - Part 4: Conditioning method to determine the minimum fractional test efficiency”
- Eurovent Document 4/21 - 2019: “Energy Efficiency Evaluation of air filters for general ventilation purposes”

II.1.2. Quality management systems standards

The company shall be certified for having a quality management system according to *ISO 9001:2015*.

All manufacturing places for the products within the scope of the certification programme shall be declared to Eurovent Certita Certification (ECC) and shall be covered by an ISO 9001 certificate:

- issued by a certification body accredited by an accreditation body member of the European co-operation for Accreditation (EA, see list in <http://www.european-accreditation.org>)
- whose scope covers at least “production” of all products within the scope of the certification programme
- valid:
 - on the day of the first selection by Eurovent Certita Certification for admission test campaign
 - on the 30th of November year n-1 for surveillance test campaigns (see Appendix A Certification schedule)

A manufacturing place is the address of the factory where the finished product is assembled.

For brand name manufacturer, an ISO 9001 certificate for “sales and after sales” is required (mandatory starting from 1st January 2015).

II.2. Specific requirements and quality management

II.2.1. Acceptance criteria

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 initial pressure drop at 50%, 100%, 75% and 125%: $+(10\%+Mt)$ or $+(10 \text{ Pa} + Mt)$ whichever largest where $Mt = 5\text{Pa}$ (measuring acceptance criteria as allowed by EN ISO 16890)

- ePM_1 , $ePM_{1,min}$, $ePM_{2.5}$, $ePM_{2.5,min}$ and ePM_{10} efficiencies: -7%-point and $\geq 50\%$ for declared ePM_x group
- For the ePM_x group: as claimed or higher
- For the annual energy consumption: +10%+ 60 kWh/y

II.2.2. Energy Efficiency Classification and Labelling

Table 1: Energy efficiency class limits for each filter class according to EN ISO 16890 measured at 0.944 m³/s.

| M_x = 200 g (AC Fine) | AEC in kWh/y FOR ePM1 (ePM_1 and $ePM_{1,min} \geq 50\%$) | | | | | |
|--|--|-------------|-------------|-------------|-------------|-----------------|
| | A+ | A | B | C | D | E |
| 50&55% | 800 | 900 | 1050 | 1400 | 2000 | >2000 |
| 60&65% | 850 | 950 | 1100 | 1450 | 2050 | >2050 |
| 70&75% | 950 | 1100 | 1250 | 1550 | 2150 | >2150 |
| 80&85% | 1050 | 1250 | 1450 | 1800 | 2400 | >2400 |
| >90% | 1200 | 1400 | 1550 | 1900 | 2500 | >2500 |
| M_x = 250 g (AC Fine) | AEC in kWh/y FOR ePM2.5 ($ePM_{2.5}$ and $ePM_{2.5,min} \geq 50\%$) | | | | | |
| | A+ | A | B | C | D | E |
| 50&55% | 700 | 800 | 950 | 1300 | 1900 | >1900 |
| 60&65% | 750 | 850 | 1000 | 1350 | 1950 | >1950 |
| 70&75% | 800 | 900 | 1050 | 1400 | 2000 | >2000 |
| 80&85% | 900 | 1000 | 1200 | 1500 | 2100 | >2100 |
| >90% | 1000 | 1100 | 1300 | 1600 | 2200 | >2200 |
| M_x = 400 g (AC Fine) | AEC in kWh/y FOR ePM10 ($ePM_{10} \geq 50\%$) | | | | | |
| | A+ | A | B | C | D | E |
| 50&55% | 450 | 550 | 650 | 750 | 1100 | >1100 |
| 60&65% | 500 | 600 | 700 | 850 | 1200 | >1200 |
| 70&75% | 600 | 700 | 800 | 900 | 1300 | >1300 |
| 80&85% | 700 | 800 | 900 | 1000 | 1400 | >1400 |
| >90% | 800 | 900 | 1050 | 1400 | 1500 | >1500 |

Examples:

- declared value: ePM₁ 66% / measured ePM₁ efficiency = 59% → passed
- declared value: ePM₁ 54% / measured ePM₁ efficiency = 48% → failed and rerate in ePM_{2,5} group (MVF = 1)
- declared value: ePM₁ 77% and ePM_{1, min} 72% / measured ePM₁ efficiency = 62% and measured ePM_{1, min} efficiency 48% → failed and rerate in ePM_{2,5} group (MVF = 2)

II.2.3. Traceability¹

The traceability of products as required in standard ISO 9001:2015 must be ensured by all participants. In some cases, such as a complaint or non-conformity, Eurovent Certita certification is entitled to ask a participant/applicant to provide information as per the origin of a specific product.

II.2.4. Management of customer claims

Customer claims and their treatment related to certified products shall be done, recorded and maintained available.

II.3. Marking

It is highly recommended that the participating company indicates participation in the EUROVENT CERTIFIED PERFORMANCE (ECP) programme for Air Filters by the following means.

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The Eurovent Certification mark consists of:

- Eurovent Certification mark in conformity with the design as presented in the Certification Manual, Appendix G. The accepted color combinations consist of green pantone n°341 on white, or black on white. Any size of Eurovent Certification mark may be used.
- Identification number provided by Eurovent Certita Certification when the certification is granted.



Figure 1: Illustration of the EUROVENT CERTIFIED PERFORMANCE (ECP) mark

II.3.1. Display of Eurovent Certified Performance logo on certified products

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The Eurovent Certification Performance logo may be affixed on each product or applied as part of the product label.

¹ See minutes of the Programme Committee meeting held on 25 September 2018.

II.3.2. Display of Eurovent Certified Performance logo on commercial and technical documentation

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The Participant shall indicate his participation in the Programme by displaying the appropriate Eurovent Certified Performance mark on all specification sheets and in other literature carrying ratings, or claiming certification of certified models, in accordance with the Certification Manual, Appendix G.

The Eurovent Certified Performance mark alone may be used in literature without certified performance data (general leaflets, advertising etc).

When used in literature containing the certified performance data (technical catalogues and leaflets) the Eurovent Certified Performance mark shall be used only once and shall be associated with the following statement (e.g. by footnote):

NAME OF COMPANY participates in the Eurovent Certified Performance Programme for: NAME OF PROGRAMME; Check ongoing validity of certificate online: www.eurovent-certification.com

a. Display of ratings according to standards other than EN ISO16890:2016

All ISO ePM₁, ISO ePM_{2.5}, ISO ePM₁₀ air filters shall be rated at least according to EN ISO16890:2016. If other ratings are given next to ECP mark, it shall be clearly stated that only the EN ISO16890:2016 rating is certified.

b. Display of Eurovent Energy Efficiency rating on filters with face dimensions different from 592x592 according to EN 15805:2010 in literature, selection programmes and advertising

Filters with face dimensions different from 592x592 according to EN 15805:2010 but which dimensions are listed in Table 1 of EN 15805:2010 or in Table 2 below can be rated according to §I.2 with the same energy class as the certified filters with the standard size belonging to the same filter family (see definition of filter family in §I.3).

Table 2: Filter face dimensions as listed in Table 1 of EN15805:2010

| Filter face dimensions (Header dimensions) | |
|--|-------------|
| Width (mm) | Height (mm) |
| 592 | 592 |
| 490 | 592 |
| 287 | 592 |
| 592 | 287 |
| 490 | 287 |
| 287 | 287 |

Table 3: Additional sizes authorized for labelling

| Filter face dimensions (Header dimensions) | |
|--|----------------------|
| Height or Width (mm) | Height or Width (mm) |
| 592 | 490 |
| 490 | 490 |
| 592 | 892 |
| 490 | 892 |
| 287 | 892 |

II.3.3. Eurovent Certified Performance energy labels

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

It is not mandatory to use Eurovent Certified Performance energy labels however it is highly recommended to do so. If an energy label is used by the participant, it is mandatory to use the layout described on our website.

High resolution files of these labels, as well as specifications for the layout are available on the website in the manufacturer's restricted area.



Figure 2: Illustration of the AIR FILTER Energy Efficiency Labels



Figure 3: Illustration of the AIR FILTER Energy Efficiency Mini Labels

III. CERTIFICATION PROCESS

III.1. Admission procedure

III.1.1. Declaration file

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The applicant, after signing the Certification Agreement, shall send to ECC all information required for the qualification: declaration file with brochures, technical data sheets, literature etc. for each ISO ePM1, ISO ePM2.5 and ISO ePM10 filters according EN ISO 16890-1:2016 he is selling on the market.

The applicant has to categorize all his ISO ePM₁, ISO ePM_{2.5} and ISO ePM₁₀ filters into a filter family, as defined in §1.3

Submittal of data shall be made by filling in the forms provided by ECC as .xls or .xlsx files. The forms shall be sent by e-mail to ECC.

These forms will be used:

- for manufacturing companies (Original Equipment Manufacturer – OEM) to declare ranges, Basic Model Groups (BMG), performance ratings and technical data.
- for Brand Name (BN) companies to identify the corresponding model's number of the original equipment manufacturer

Sales documentation shall be supplied for each filter family as an Excel file containing the following information:

- Model/type code
- Product category (e.g. Bag, V-type)
- Filter media
- Basic construction details, number of pockets or “V-shaped” related to a front frame with a size of 592x592 mm according to EN 15805:2010,
- filter depth
- Face dimensions
- Nominal flow rate
- Initial pressure drop *at 50%, 75%, 100% and 125% of the airflow rate*
- ePM₁, ePM_{1,min}, ePM_{2.5}, ePM_{2.5,min} and ePM₁₀ efficiencies according EN ISO 16890
- Eurovent Energy Efficiency Class according to II.2.2²
- Annual Energy Consumption according to Eurovent Document 4/21 (*Eq. (1a)*).
- Filter frame material within a filter family may differ
- Filter ISO class rating according to EN ISO 16890.

If an ISO ePM₁ or ISO ePM_{2.5} or ISO ePM₁₀ filter cannot reach the minimum dust holding capacity defined in Eurovent Document 4/21 – 2019 or if the filter is declared with energy class E, “>XXX” will be displayed on the Eurovent Certified Performance website with “XXX” the threshold between energy class D and energy class E corresponding to the filter class of the filter³. If this filter is selected for test, the energy efficiency calculation according to Eurovent Document 4/21 – 2019 is *not performed*.

All actual printouts of the brochures as published on the participant's homepage must be sent to Eurovent Certita Certification. Eurovent Certita Certification will check if the data for the excel list are identical to the ones published in the brochures. In addition, an actual certificate for the applicant's quality management system must be supplied.

In reporting models for certification and for publication on the Eurovent Certified Performance website, certified ratings shall be given for all Air Filters which meet the requirements of this TCR Standard.

Besides current models, the applicant shall provide Eurovent Certita Certification the list of New models (see Appendix D of the Certification Manual).

It is authorized to declare the performance of one filter for different air volume flows⁴.

Confidentiality of Certification Data: All data submitted to Eurovent Certita Certification is confidential except for information authorised to be published on the Eurovent Certified Performance website.

A full EN ISO16890-1:2016 and EN ISO16890-3:2016 (except for model with Energy Efficiency Class “E”) test reports shall be sent to ECC for 100% of the listed filters.

Measuring devices & Calibration test reports:

If the participant provides external test reports, then he shall also provide the ISO 17025 certificate of the laboratory used (except if it is a laboratory used by ECC).

If the external laboratory is not accredited according to ISO 17025, then the participant shall ask to its supplier the calibration reports defined below and to provide them to ECC.

² Eurovent Document 4/21 – 2019 can be downloaded free of charge on Eurovent association website:

<http://www.eurovent-association.eu> .

³ See minutes of the Programme Committee meeting held on 15 March 2012.

⁴ See minutes of the Programme Committee meeting held on 15 March 2012.

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If the participant provides internal test reports, then he shall provide ECC with the calibration test reports of the relevant measuring devices at least every 2 years. The measuring devices are at least:

- OPC
- Pressure sensors

These reports shall be provided at the start of the campaign⁵ *and shall be valid on January 31st of each years*

The applicant shall declare all their production places around the world in accordance with §II.1.2⁶ with the corresponding ISO 9001 certificate.

III.1.2. Admissibility of the application

The provisions of the Certification Manual apply.

The declaration list is checked according to the requirement in §III.1.1

When a declared value is out of tolerance regarding internal test reports, the performance shall be rerated according to the test measured value or lower (for efficiency values) and higher for (Annual energy consumption or initial pressure drop), respectively.

III.1.3. Implementation of checking operations

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The excel file Declaration file FIL-1 filled by the Applicant shall be submitted to the Programme Committee FIL (PC-FIL) for a review the declared performances with a deadline of 15 days. The file submitted shall be in anonymous format, with no reference to the Applicant name, trade name, range name, or product reference.

III.1.3.1 Initial admission audit

Not applicable

III.1.3.2 Selection of filters to be tested

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

Based on the review from PC-FIL, Eurovent Certita Certification shall select six air filters elements from different filter families *when possible*. In addition, ECC will decide the production places where the selected filters shall be produced in accordance with the declaration of the production factories (see §III.1.1). Eurovent Certita Certification allocates an Identification Number (ID) for each filter to be tested before sending it to the laboratory. Eurovent Certita Certification is the only one deciding the random distribution of the test filters to the independent laboratories.

a. Sampling on-site

A representative person of ECC shall contact the manufacturer in order to plan the sampling date in one of the storage location or production place declared by the manufacturer. *The representative person of ECC also sends a list of all filters that could be sampled. The applicant may add additional explanation on filters with specific production condition, availability (if any) etc.*

Introduction meeting: The ECC representative shall present the aim of the sampling. The manufacturer representative shall list all the areas on the site where certified filters can be sampled.

⁵ See minutes of the Programme Committee meeting held on 3 April 2019

⁶ See minutes of the Programme Committee meeting held on 3 April 2019

Sampling: ECC will select 1 filter element from 6 certified filter references for testing according to EN ISO16890:2016. *Within these 6 filters, one specific filter can be selected from the declaration list by the ECC representative even if it is not available on site. This filter may be manufactured during the sampling or after the sampling date. The other filters are sampled according to availability on production lines and/or storage. Sampling on different batches shall be done when possible.*⁷ In order to sample filters for the potential second test, 1 additional filter will be sampled for each reference. The selected filter elements will be packed in a box and marked and sealed by the ECC representative and photos of the marked/sealed boxes will be taken. These photos will be sent by ECC to the selected independent laboratory.

Conclusion meeting: The manufacturer representative signs a sampling sheet detailing the place and date of the sampling, the name of the ECC representative and the manufacturer representative, the references and serial numbers of the filters sampled, the address of the independent laboratory selected by ECC and the deadline for delivery. The ECC representative will report how the sampling proceeded and this report will be signed by both ECC and manufacturer representatives.

b. Delivery

The manufacturer will deliver the selected filters not later than 2 weeks after the sampling date.

III.1.3.3 Tests at the independent laboratory

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

Eurovent Certita Certification scheduled tests shall be performed at the Independent Laboratory selected by Eurovent Certita Certification.

Before testing, the laboratory shall check the product against the information declared in the technical datasheet to ensure that the filter corresponds to the selection (e.g. filter type, number of pockets, filter area, filter class and nominal air flow rate written on the filter).

Only the independent laboratory personnel shall be permitted to handle the test filters.

The laboratory shall not perform the test and contact EUROVENT CERTITA CERTIFICATION:

- one of the information is not compliant with the technical datasheet (see technical appendix),
- one of the filters appears damaged

EUROVENT CERTITA CERTIFICATION will contact the applicant to give instructions regarding further actions.

The laboratory shall be responsible for correct storing, unpacking, handling, and testing. Filters that passed the test will be disposed of by the laboratory in agreement with Eurovent Certita Certification. The laboratory personnel may make repairs of the test filter elements unit only in agreement with the Applicant.

No Applicant's personnel are allowed to be present in the test facility during the test.

a. Time limitation of acquisition and recovery of filters

The provisions of the Certification Manual apply.

Once all the tests for the campaign are finished, the applicant may recover the remaining filters that were not tested. The applicant must inform ECC about its decision within one month after the reception of the last test results report.

b. Test conditions

The tests shall be conducted at the following conditions:

⁷ See minutes of the Programme Committee meeting held on 4 March 2020

All independent laboratories must 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: The testing of all filters shall be based on dust from the same source.

The tests must be performed in the following order:

- Initial pressure drop at 50%, 100%, 75% and 125%
- Initial fractional efficiency curve from 0,3 µm to 10 µm
- Discharged fractional efficiency curve from 0,3 µm to 10 µm
- Determination of the ePM_x group
- Dust Load
- Energy class calculation

Note: During the 1st test, if the Participant/Applicant asks to continue the test after the failure regarding the ePM_x group then the laboratory shall use the correct dust amount defined in Eurovent Document 4/21 – 2019 acc. to the measured ePM_x group.

For a second test, the laboratory shall use the correct dust amount defined in Eurovent Document 4/21 – 2019 acc. to the measured ePM_x group during this 2nd test.

c. Report of tests results

Upon completion of the tests on each filter, the Laboratory will render its complete report as PDF file to Eurovent Certita Certification and the Applicant. Eurovent Certita Certification will transmit a copy of the report together with reporting test result to the Applicant

For models tested, results are sent by Eurovent Certita Certification, showing the deviations between declared and measured data.

d. Failure treatment

Reasons of failure

After a failure, the applicant shall examine the reasons of the failure⁸.

The Applicant shall be authorised by Eurovent Certita Certification to examine the reasons of the failure on location or to have the filter returned. The laboratory must not dispose of the filters that failed.

Initial test failure

Prior to the test, the laboratory must visually inspect each filter. Should the aspect be suspect, the Applicant and Eurovent Certita Certification are contacted by the laboratory.

In case of a damaged filter element, the laboratory shall inform Eurovent Certita Certification immediately and make a notice to the Applicant. The Applicant shall then send a new filter of the same model.

General

A unit failure is automatically confirmed when the test results are not in accordance with claimed data, according to acceptance criteria's specified in §II.2.1, except if there is an error of the test laboratory or a damage of the filter the Applicant is not responsible for.

⁸ See minutes of the Programme Committee meeting held on 25 September 2018

In case of a unit failure occurred, the Applicant has within 4 working weeks after notification of failure to select one of the following alternatives:

1. Re-rate the product in accordance with the re-rating rules;
2. Ask for a second test. In case this second test is successful, no re-rating will be required. In case the second test is unsuccessful, the Applicant shall comply with point 1.

During the first test, when the filter does not meet the claimed performance, the laboratory shall inform the Applicant and Eurovent Certita Certification and ask whether the test shall be continued or not. If the Applicant doesn't want the test to continue, then he must send to Eurovent Certita Certification a written note. Then a second test is mandatory. In case this second test is successful, no re-rating will be required. In case the second test is unsuccessful, the Applicant shall comply with point 1 above.

In case the applicant asks a second test on a new model than the one already sampled, then this new model shall be sampled on site within 2 months. One penalty test will be required during the following test campaign.

Note: During the 1st test, if the Applicant asks to continue the test after the failure regarding the ePM_x group then the laboratory shall use the correct dust amount defined in Eurovent Document 4/21 – 2019 acc. to the measured ePM_x group.

Rating requirements

The tested filter shall be re-rated according to the test results. For the initial pressure drop, the re-rated value is the measured value rounded to the nearest multiple of 5 Pa.

MVF value > 10% (see description in Appendix B)

When a model is rerated, the participants/applicant has to decide to rerate by default the whole range impacted (filters within the same range, same ISO group and efficiency, with the same type of media) or to test 2 additional filters (with the minimum length and number of bags and the maximum length and number of bags) from this range in the same campaign. In case of failure for one of these additional filters, the rerate of the whole range would be applied.

For participant with MVF>10%, a 2nd sampling must be done for the dedicated additional filters and sent if necessary, to the laboratory.

Rating requirements when MVF > 10%

Application of the percentage of the deviation of the model tested to the model(s) with same range, same ISO group and efficiency, with the same type of media for initial pressure drop and AEC.

Application of the deviation value of the model tested to the model(s)) with same range, same ISO group and efficiency, with the same type of media for efficiencies.

| Model tested | | | | Model(s) of the same "range" | | | |
|---------------------|---------------------------|-------------------|-------------------|-------------------------------------|---------------------------|-------------------|-------------------|
| | <i>Pressure Drop (Pa)</i> | <i>Effic. (%)</i> | <i>AEC (kW/y)</i> | | <i>Pressure Drop (Pa)</i> | <i>Effic. (%)</i> | <i>AEC (kW/y)</i> |
| <i>Declared</i> | 55 | 78 | 1000 | <i>Declared</i> | 52 | 80 | 870 |
| <i>Measured</i> | 72 | 70 | 1200 | <i>Deviation</i> | -16 (-31%) | -8 | -174 (-20%) |
| <i>Deviation</i> | -17 (-31%) | -8 | -200 (-20%) | <i>Rerate</i> | 68 | 72 | 1044 |
| <i>Rerate</i> | 72 | 70 | 1200 | | | | |

III.1.3.4 Software checking procedure

Not applicable

III.1.3.5 Desk study

Not applicable

III.1.4. Evaluation and decision

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

When results of tests are within the allowed acceptance criteria defined in §II.2.1, the laboratory shall provide Eurovent Certita Certification with a test report (which includes the name of the manufacturer). The laboratory test reports shall always present measured performances. The interpretation of the results belongs to ECC (See Interpretation of test results in Appendix C)

In any case the report shall contain a table presenting all claimed, measured, and allowed performance values as follow:

| Property | Claimed | Measured | Allowed |
|-------------------------------------|---------|----------|---------|
| Initial pressure drop @100% airflow | | | |
| Initial pressure drop @50% airflow | | | |
| Initial pressure drop @75% airflow | | | |
| Initial pressure drop @125% airflow | | | |
| ePM ₁ | | | |
| ePM _{1,min} | | | |
| ePM _{2.5} | | | |
| ePM _{2.5,min} | | | |
| ePM ₁₀ | | | |
| Filter class | | | |
| Annual energy consumption | | | |
| Energy efficiency class | | | |

Whenever results of a test are not in accordance with the requirements defined in §II.2.1 the laboratory shall generate a corresponding test report related to the ID Number. *Participant name* must not be stated on that report. It is provided only to Eurovent Certita Certification who shall inform the participant. In that case, the procedure for failure treatment shall be applied.

The following statement shall appear on all the test reports: “Determination of filtration performance for certification of ISO ePM₁, ISO ePM_{2.5}, ISO ePM₁₀ filters”.

If all the test results are in accordance with the requirements of §II.2.1, all products sold EN ISO 16890-1:2016 classes ISO ePM₁, ISO ePM_{2.5}, ISO ePM₁₀ are certified by Eurovent Certita Certification: Certification is granted until the date defined in Appendix A.

III.1.4.1 Penalty tests

One (1) additional filter will be selected in case of:

- deviation of more than $+(20\%+Mt)$ or $+(20\text{ Pa}+Mt)$ whichever is the largest, where $Mt = 10\text{ Pa}$ for the initial pressure drop
If one or more of the pressure drops performance are failed (50%, 75%, 100% and 125%) acc. to the high failure, a penalty test will be asked during the next campaign.
- deviation of more than $+(20\%+60\text{ kWh/y})$ for the Annual Energy Consumption.
- deviation of more than -15% point on ePM_1 , $ePM_{1,\min}$, $ePM_{2.5}$, $ePM_{2.5,\min}$ and ePM_{10} efficiency value

If a second test is asked by the applicant, only the results of the second test will be considered. Each test leading to a high failure will lead to one penalty test (however there is a maximum of one penalty test per filter tested). Several penalty tests can therefore be asked during one test campaign.

This additional selection shall be made immediately, and the test must be validated before the certification is granted.

III.1.4.2 Non application of procedures

Non-application of procedures and relevant penalties are described in the Certification Manual, Section III.4.

III.1.4.3 Publication of certified data by Eurovent Certita Certification

The certified data of the certified products are published on Eurovent Certified Performance website: www.eurovent-certification.com

Eurovent Certita Certification will supply, on request, to any interested party, the current status of any participant or of any model (new, deleted or obsolete).

The following information to each model certified shall be published on the Eurovent Certified Performance website:

- Name of Company
- Trade or brand name of model
- Model name
- Filter media
- Basic design
- Pocket length
- Face dimensions (592x592 according to EN 15805:2010)
- Nb of pockets or "V"s
- Nominal air flow rate
- Initial pressure drop at 50%, 75%, 100% and 125% of the air flow rate
- ePM_1 , $ePM_{1,\min}$, $ePM_{2.5}$, $ePM_{2.5,\min}$ and ePM_{10} measured efficiencies
- Eurovent Energy Efficiency Class NEW
- Annual Energy Consumption NEW
- ISO efficiency rating according to EN ISO16890:2016

III.2. Surveillance procedure

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

Once certified, the Applicant is called Participant.

Every year, Eurovent Certita Certification checks whether the certified products still meet the requirements. An update of the declaration file is asked to the participant according to campaign schedule. In case of modification of the models, §III.3.4 and/or §III.3.5 apply.

III.2.1. Implementation of surveillance operations

In addition to the provisions laid down in the Certification Manual, the requirements described in §III.1.1 apply:

However:

- the anonymous Declaration file FIL-1 files shall not be submitted to the Programme Committee for review
- Further to the independent tests made by Eurovent Certita Certification, a full EN ISO16890-1:2016 and EN ISO16890-3:2016 (except for model with EEC with “E”) test reports shall be sent for all new declared filters. All new reports should be sent with the updated declaration list. *In case of missing information, the update on the declaration list (including on the ECC internet webpage) will be delayed until full reception of the information.*

III.2.1.1 Surveillance audit

Not applicable

III.2.1.2 Selection of filters to be tested

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The procedure described in §III.1.3.2 is repeated annually. However, Eurovent Certita Certification shall select four air filters elements from different filter families.

III.2.1.3 Surveillance tests

In addition to the provisions laid down in the Certification Manual, the requirements described in §III.1.3.3 and following requirements apply:

Within the programme, tests may be conducted under the following procedures:

- Scheduled tests in admission procedure
- Scheduled tests in surveillance procedure
- Penalty test
- Complaint test (challenge procedure)

Eurovent Certita Certification retains the right to make anticipated tests in case of:

- Modification of the declared list out of the certification schedule (additional filters or modification of already listed filters; see §III.3.4);

Eurovent Certita Certification retains the right to make additional tests in case of:

- Complaint from a Participant’s customer;
- Complaint from a non-certified manufacturer;
- Following an internal checking of the declaration list or of the manufacturer’s commercial documentation.

In these cases, the complainer (that is the participant’s customer, the non-certified manufacturer or Eurovent Certita Certification) shall pay for the test. If the test confirms the non-compliance of one of

the certified performances, the re-rating procedure shall apply, and the certified manufacturer must pay for the test.

III.2.1.4 software checking procedure

Not applicable

III.2.1.5 Desk study

Not applicable

III.2.1.6 Technical and commercial documentation check

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

In case of rerating, the participant must correct its technical documentation within 8 weeks.

III.2.1.7 Challenge procedure

In addition to the provisions laid down in the Certification Manual, the following procedure for the challenge procedure apply:

1. Request of challenge procedure
2. Analysis by ECC of the complaint
3. Ask for additional information if needed by ECC
4. Invoice and payment of the fees (testing and general) to both involved parties (the complainant and the challenged participant)
5. Sampling on site should be organized within 1 month after the payment of the related invoices
6. Delivery of the filters within 2 weeks
7. Test in laboratory
8. Analysis and treatment of the results
9. Communication of the conclusion to both part
10. Credit note acc. to conclusion (to the complainant or the challenged Participant)

The whole procedure could be fulfilled within 3 to 4 months if all the deadlines are met.

During 1 sampling on site and if more than one model is under a challenge procedure, all general fees (administrative, sampling, travel cost...) are charged to the challenged Participant if at least one test result is out of tolerance.

III.2.2. Evaluation and decision

In addition to the provisions laid down in the Certification Manual, the requirements described in §III.1.4 apply and the following requirements:

If the participants fulfilled all previous test campaigns and provided all the necessary elements and delivered all the filters for the current campaign, the certification is renewed for another campaign.

III.2.2.1 Penalty tests

Each test leading to a high failure will lead to one penalty test for the next campaign (however there is a maximum of one penalty test per filter tested). Several penalty tests can therefore be asked during one test campaign.

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III.2.2.2 Non application of procedures

Non-application of procedures and relevant penalties are described in the Certification Manual, Section III.4.

To come back to the certification programme, the suspended participant must complete the test campaign of the year he has been suspended for (n) and give all the necessary elements for the following test campaign (n+1).

III.2.2.3 Repeated failures along the test campaigns

The rules regarding Mean Value of Failure (MVF) are described in Appendix B

III.3. Declaration of modifications

The provisions of the Certification Manual apply.

III.3.1. Changes concerning the participant

The provisions of the Certification Manual apply.

III.3.2. Changes concerning production sites

The provisions of the Certification Manual apply.

III.3.3. Changes concerning the quality organisation of the manufacturing and/or marketing process

The provisions of the Certification Manual apply.

III.3.4. Changes concerning the declaration list (model and/or range)

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

Submittal of data shall be made by filling in the forms provided by EUROVENT CERTITA CERTIFICATION as .xls or .xlsx files. The forms shall be sent by e-mail to EUROVENT CERTITA CERTIFICATION within the time limits specified in Certification Schedule (see Appendix A – Campaign schedule).

In reporting models for certification and for publication on the Eurovent Certified Performance website, certified ratings shall be given for all Air Filters which meet the requirements of this TCR Standard.

Besides current models, the Participants shall provide Eurovent Certita Certification the list of (see Appendix D of the Certification Manual):

- New models
- Deleted models,
- Obsolete models.

The participant shall inform Eurovent Certita Certification of all modifications of products that have relevance to the published data. Updated literature shall be sent to Eurovent Certita Certification as soon as available.

It is authorized to declare the performance of one filter for different air volume flows⁹.

Changes on performances of models never tested or related¹⁰ can be authorized. Eurovent Certita Certification will check the consistency of the new data and validate them or not. Such changes shall always be justified by the manufacturer in order to be authorized. The filters concerned will be tested in priority during the following test campaign.

Confidentiality of Certification Data: All data submitted to Eurovent Certita Certification is confidential except for information authorised to be published on the Eurovent Certified Performance website.

III.3.5. Changes concerning the certified product

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The participant shall inform Eurovent Certita Certification of any modification of the product portfolio by updating the declaration file (FIL-1). Non-compliance of the participant is considered as non-application of procedures (see §III.2.2.2).

EUROVENT CERTITA CERTIFICATION decides whether the modification is significant for the certified performance data or not. In the case of significant modifications EUROVENT CERTITA CERTIFICATION is entitled to request adequate tests to check the influence on performance data. This test shall not be considered as a repetition one.

III.3.6. Temporary or permanent cessation of production of a certified product

The provisions of the Certification Manual apply.

III.4. Suspension/cessation conditions

The provisions of the Certification Manual apply.

III.5. Publication of the certified performances

The certified data of the certified products are published on Eurovent Certified Performance website: www.eurovent-certification.com

Eurovent Certita Certification will supply, on request, to any interested party, the current status of any participant or of any model (new, deleted or obsolete).

The following information pertaining to each model certified shall be published on the Eurovent Certified Performance website:

- Name of Company
- Trade or brand name of model
- Model name
- Filter media
- Basic design
- Pocket length
- Face dimensions (592x592 according to EN 15805:2010)
- Nb of pockets or "V"s
- Nominal air flow rate
- Initial pressure drop at 50%, 75%, 100% and 125% of the air flow rate
- ePM₁, ePM_{1,min}, ePM_{2.5}, ePM_{2.5,min} and ePM₁₀ measured efficiencies
- Eurovent Energy Efficiency Class NEW

⁹ See minutes of the Programme Committee meeting held on 15 March 2012.

¹⁰ See minutes of the Programme Committee meeting held on 15 March 2012.

- Annual Energy Consumption NEW
- ISO efficiency rating according to EN ISO16890:2016

APPENDIX A. CAMPAIGN SCHEDULE

For each surveillance test campaign (year n), the following schedule shall be applied:

| | | Normal Schedule |
|----|--|---|
| 1 | <i>Eurovent Certita Certification asks for up-date of product list and all production places</i> | <i>31/01/n</i> |
| 2 | <i>Participant confirms up-date of products list and provides list of production places</i> | <i>15/02/n</i> |
| 3 | <i>Eurovent Certita Certification send selection with associated production place and sampling invoice</i> | <i>31/03/n</i> |
| 4 | <i>Validation by participant</i> | <i>30/04/n</i> |
| 5 | <i>Sampled filters are all sampled</i> | <i>30/06/n</i> |
| 6 | <i>Sampled filters are all delivered</i> | <i>15/07/n</i> |
| 7 | <i>All payments from Participant are completed</i> | <i>31/07/n</i> |
| 8 | <i>Certificate are valid until</i> | <i>31/08/n+1</i> |
| 9 | <i>The Laboratory carries out all first tests</i> | <i>15/12/n</i> |
| 10 | <i>Eurovent Certita Certification sends the test reports</i> | <i>Date of reception of test report + 15 days</i> |

APPENDIX B. CALCULATION METHOD AND IMPLEMENTATION OF MEAN VALUE OF FAILURE (MVF)

B.I. General

Mean Value of Failure (MVF) is equal, for each manufacturer, to the ratio between the total number of measurements which failed and the total number of performed measurements in the considered years.

$$\text{MVF} = \frac{\sum \text{Number of measurements failed}}{\sum \text{Number of measurements performed}}$$

Mean Value of Failure *Number of considered years* *Number of considered years*

MVF considers the following performances:

- Initial pressure drop at 50% or 75% or 100% or 125%
- ePM₁, ePM_{1,min}, ePM_{2.5}, ePM_{2.5,min} and ePM₁₀ measured efficiencies
- ePM_x group
- Annual energy consumption

If one or more of the pressure drop performances are failed (50%, 75%, 100% and 125%), only one MVF will be noted.

When there is a second test on a filter, then the first test is not considered.

If the MVF is equal to 0%, one less filter will be selected for the next test campaign that is three tests will have to be performed instead of four.

A manufacturer is suspended from the Certification Programme for one year if the MVF is higher than 15%, starting campaign 2020, i.e. considering the results from the campaigns 2018-2019-2020.

B.II. Newcomers and admission procedure

During his admission procedure, the MVF shall not be higher than 15%. If the MVF is higher than 15%, the Applicant shall not be granted the certification.

After one year the applicant can apply again through the regular admission procedure.

A manufacturer that leaves the programme and rejoins some years later is considered to be a newcomer if he rejoins after three years. If he rejoins before, all the latest existing test campaigns are considered, with minimum two and maximum three. The same rule applies if the manufacturer has been suspended for one year.

APPENDIX C. TEST RESULTS INTERPRETATION

The interpretation of the results belongs to ECC. The different cases are given hereunder with the corresponding interpretation.

C.I. All performances are within the tolerances

| | Declaration | Measured |
|-------|-------------------|-------------------|
| ePM1% | 68 | 65 |
| Group | ePM1 | ePM1 |
| % | 65 | 65 |
| EEC | Based on ePM1 65% | Based on ePM1 65% |

Interpretation: there is no rerate

C.II. Some performances are out the tolerances

| | Declaration | Measured |
|---------|-------------------|---------------------|
| ePM1% | 55 | 49 |
| ePM2.5% | 70 | 65 |
| Group | ePM1 | ePM2.5 |
| % | 55 | 65 |
| EEC | Based on ePM1 55% | Based on ePM2.5 65% |

Interpretation: rerate of failed value is done acc. to laboratory test report

C.III. All performances are within the tolerances, however, the filter ISO class is different from the declaration

| | Declaration | Measured |
|-------|-------------------|-------------------|
| ePM1% | 65 | 59 |
| Group | ePM1 | ePM1 |
| % | 65 | 55 |
| EEC | Based on ePM1 65% | Based on ePM1 55% |

The measure of the EEC is done based on filter ISO class ePM_x XX% measured by the laboratory.

Interpretation:

Case 1: AEC is inside of tolerance, no rerate of the Energy Efficiency Class (EEC)

Case 2: AEC is out of tolerance, Rerate of the Energy Efficiency Class acc. to ePM_x XX% declared by the participant (because Measured efficiencies are inside of tolerance)

C.IV. All performances are within the tolerances, however, the ePM_x group measured is better than in the declaration

| | Declaration | Measured |
|---------|---------------------|---|
| ePM1% | 50 | 50 |
| ePM2.5% | 65 | 65 |
| Group | ePM2.5 | ePM1 |
| % | 65 | 50 |
| EEC | Based on ePM2.5 65% | Based on ePM1 50% And for information based on ePM2.5 65% |

The measure of the EEC is done based on filter ISO class ePM_x XX% measured by the laboratory. In addition, the EEC based on filter ISO class ePM_x XX% declared by the participant can be also displayed

Interpretation:

Case 1: AEC is inside of tolerance, no rerate of the Energy Efficiency Class (EEC)

Case 2: AEC is out of tolerance, Rerate of the Energy Efficiency Class acc. to filter ISO class ePM_x XX% declared by the participant (because Measured efficiencies are inside of tolerance)



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