



TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK



VENTILATION DUCTS

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The purpose of this Technical Certification Rules is to prescribe procedures for the operation of the Eurovent Certified Performance (ECP) certification programme for Ventilation ducts (DUCT), in accordance with the Certification Manual.

Modifications as against last version:

No.	Modifications	Section	Page
1	New structure	all	all
2	Introduction of EN 17192:2008 for Non metallic ducts	all	all
3	Clarification of Specific requirements and quality management	II.2	8-10
4	Modification of the number of sites audited	III.1.3.1	12-13
5	Specific process for the metallic ducts manufacturers using fittings from ECP DUCTS certified ductwork	III.1.3.1 – Appendix A.I	12-14-15 20-22
6	Optimisation of the Non-metallic surveillance tests frequency	III.2.1.3.	17
7	Precision of case 4 for ducts manufacturer only	Appendix B	42
8	Update of Campaign Schedule (addition of the quarter 4)	Appendix C	44-45

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Published by Eurovent Certita Certification
 48-50 rue de la Victoire
 75009 Paris, FRANCE

Tel: + 33 1 75 44 71 71
 E-mail: s.raffier@eurovent-certification.com

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I. GENERAL INFORMATION

I.1. Scope

I.1.1. General

The DUCT programme scope covers rigid and semi-rigid ventilation ductwork systems (as defined in standard EN 12792:2003) divided into the following sub-programmes:

- Rigid metallic ductwork systems with circular cross-section up to a maximum of 1,23 m² included (DUCT-MC);
- Rigid metallic ductwork systems with rectangular cross-section up to a maximum of 4 m² included (DUCT-MR);
- Semi-rigid non-metallic ductwork systems predominantly made of plastics (DUCT-P);

Each of these sub-programmes is the subject of a dedicated Technical Appendix, identified using the sub-programme acronym:

- APPENDIX A.I for DUCT-MC sub-programme;
- APPENDIX A.II for DUCT-MR sub-programme;
- APPENDIX A.III for DUCT-P sub-programme.

The programme applies to ducts with integrated sealing solution as described in each relevant Technical Appendix.

Only ductwork systems with an air-tightness class equal or better than A (according to EN 13779:2007 definition) are covered by the DUCT certification programme.

The present programme does not cover other types of ventilation ductwork elements like flexible ducts (as defined in standard EN 12792:2003), double-wall ductwork or ductwork made of insulation ductboards.

I.1.2. Certify-all principle

Whenever a company participates in one of the DUCT sub-programmes, all ranges 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 sub-programme, shall be certified, in accordance with this Technical Certification Rules. For each DUCT sub-programme, the certify-all requirement as defined in the Certification Manual is applicable not only to the European market but worldwide.

I.2. Certified performances

Certified performance items:

- | | |
|--|---------------------------|
| ○ Air tightness class (all): | as claimed or better |
| ○ Positive and negative pressure limits (all): | as claimed (no tolerance) |
| ○ Dimensions (DUCT-MC): | as per EN 1506: 2007 |
| ○ Dimensions (DUCT-MR): | as per EN 1505: 1998 |
| ○ Maximum service temperature (DUCT-P): | as claimed (no tolerance) |
| ○ Minimum service temperature (DUCT-P): | as claimed (no tolerance) |
| ○ Resistance to external pressure (DUCT-P): | ±10% |

I.3. Definitions

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

Air leakage limit

The air leakage limit (f_{\max}) is the maximum permitted leakage factor for the ductwork according to its air tightness class defined as per the ductwork classification.

Air tightness class

The air tightness classes A to D are defined as per the ductwork classification that appear in the relevant standards:

- EN 12237:2003 for Metallic circular ducts.
- EN 1507:2006 for Metallic rectangular ducts
- EN 17192:2018 for Non metallic ducts

Design operating pressure

Maximum static pressure difference p_{design} (Pa) for which the installed ductwork is designed to operate under normal conditions.

Duct

A duct is in a general way the envelope of the space in which the air is carried.

Ductwork surface area

The surface area (m^2) of the metallic ductwork is determined according to EN 14239:2004 for ducts and fittings and EN 15727:2010 for technical ductwork components.

The non-metallic ductwork surface area, or total internal surface area (m^2), is the sum of each internal perimeter multiplied by the length of that section of the ductwork. For semi-rigid ductwork the length to be considered is the centerline.

Ductwork system

The ductwork system refers to the assembly of the ducts and fittings of an HVAC (Heating, Ventilation and Air-Conditioning) installation that are used to supply the air to or extract the air from the conditioned spaces.

It does not include components such as air handlers, heat recovery units, air terminal devices, coils.

Integrated/additional sealing solution

The integrated and additional sealing solutions are defined in each Technical Appendix.

Leakage factor

The leakage factor (f) is the leakage flow rate per unit of ductwork surface area expressed in $[m^3 \cdot s^{-1} \cdot m^{-2}]$ with q_v the leakage flow rate at a given test pressure in $[m^3 \cdot s^{-1}]$ and A the ductwork surface area in $[m^2]$:

$$f = \frac{q_v}{A}$$

Longitudinal seam

Joint oriented in the direction of the air flow.

Minimum / maximum Service Temperature

Lowest / highest temperature at which the ducts and fittings, when installed, continue to function within specified limits of performance.

Nominal diameter and nominal size

A ductwork of circular cross-section is characterized by its nominal diameter d_n as defined in EN 1506:2007.

A ductwork of semi-circular cross-section is characterized by its hydraulic diameter D_H expressed in [m] with A_c the internal cross-sectional area of the duct in [m²] and P the internal perimeter of the cross section of the duct in [m]:

$$D_H = \frac{4 \times A_c}{P}$$

Range

A range of ductwork present the following identical features:

- range designation
- geometry (circular, semi-circular or rectangular cross section)
- material list (main material + available options)
- rigidity (rigid as per definition stated in standard EN 12792:2003)
- sealing solution designation
- mechanical connection designation

Resistance to external pressure

The resistance to external pressure value is given as the force F that is the maximum allowed force received to reach a duct height deformation of 3 %. The value shall be rounded down to the nearest ten.

Rigid/semi-rigid/flexible ductwork

The definitions for rigid/semi-rigid and flexible ductwork that are stated in standard EN 12792:2003 apply.

Size categories

The size categories for metallic ductwork elements are defined in each Technical Appendix.

Side lengths

A ductwork of rectangular cross-section is characterized by its side lengths a and b as defined in EN 1505:1998.

Static gauge pressure limit

Maximum design operating pressure p_s (Pa) for the ductwork according to its air tightness class.

Technical ductwork product

Component, including its connection pieces, installed in the ductwork that has one or more functions more than conveying air.

Test pressure

Static air pressure difference p_{test} (Pa) between the ductwork to be tested and the surrounding air.

Total joint length

Length (m) of joints resulting from the installation of the ductwork, that is the sum of each joint perimeter.

Transverse joint

Connection of two duct or fitting elements, oriented perpendicular to the air flow.

Typical ductwork system

When a ductwork system is set up in compliance with the requirements specified in relevant Technical Appendix and it is then considered representative of the range to be certified and referred to as "typical ductwork system".

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:

EUROFINS Expert Services Ltd
Tekniikantie 15 A, Research Hall 1
FI 02150 ESPOO
FINLAND
www.eurofins.fi/expertservices

II. REQUIREMENTS OF THE REFERENCE DOCUMENT

II.1 Reference documents

II.1.1. Product and test standards

The test procedure is detailed in the technical appendix and in the product and test standards. The applicable standards are as follow (non-exhaustive list):

EN 1506: 2007	Ventilation for buildings - Sheet metal air ducts and fittings with circular cross-section
EN 1505: 1998	Ventilation for buildings - Sheet metal air ducts and fittings with rectangular cross section - Dimensions
EN 12792: 2003	Ventilation for buildings. Symbols, terminology and graphical symbols
EN 12237: 2003	Ventilation for buildings – Ductworks - Strength and leakage of circular sheet metal ducts
EN 1507: 2006	Ventilation for buildings - Sheet metal air ducts with rectangular section - Requirements for strength and leakage
EN 17192: 2018	Ventilation for buildings - Ductwork - Non-metallic - ductwork - Requirements and test methods
EN 14239: 2004	Ventilation for buildings. Ductwork. Measurement of ductwork surface area
EN 15727: 2010	Ventilation for buildings - Ducts and ductwork components, leakage classification and testing

II.1.2. Quality management systems standards

EN ISO 9001:2015, Quality management system – Requirements.

For brand name manufacturer, an ISO 9001 certificate for “sales and after sales” is required.

II.2 Specific requirements and quality management

Production requirements

Incoming inspections

Orders shall clearly describe the ordered part (technical specifications, quantities, lead times ...) and the related technical specifications.

The applicant/participant shall establish and implement incoming inspection by sampling or other need processes to ensure that the purchased parts are in compliance with the specified requirements and the declaration file (DUCT-2).

The results of incoming inspection shall be recorded. The acceptance criteria and the non-conformity management shall be clearly integrated in this recording.

Inspections during manufacturing process

The products conformity with the technical specifications is regularly evaluated and the corresponding evaluations are recorded;

The manufacturing process key steps are submitted to a validation check which results are recorded, in particular a dimensional check shall be performed at least once a day and after material, diameter or production parameters change:

- Diameter,
- Length,
- Thickness,
- Reinforcement,
- Material type, if applicable.

Inspections on the final product

Each manufactured product must be operated at the end of the production line to check that it works properly.

Periodic inspections must be carried out to ensure the compliance and presence of the marking on the certified product, as defined in the Technical Certification Rules.

Visual inspections shall be carried out before the product is packaged.

All the inspections and tests carried out throughout the assembly process shall be validated and recorded.

Production identification and traceability:

The participant shall use suitable means to identify the products, at least on packaging, by a unique identification code (the minimum traceable information: production plant, N° of lot, components), and the retention of documented information (records) necessary to enable traceability.

Quality management requirements

Control of monitoring and measuring equipment

The measurement, inspection and testing equipment having an influence on the tests conducted within the scope of certification mark shall be:

- calibrated or checked at a specified frequency or prior to use, based on measurement standards associated with international or national calibration standards (when such standards do not exist, the reference used for calibration shall be recorded),
- calibrated as often as required,
- identified in order to determine the validity of the calibration,
- protected against adjustments likely to invalidate the measurement results,
- protected against damage and deterioration during handling, maintenance and storage.

In addition, the manufacturer shall assess and record the validity of previous measurement results when it is determined that equipment is not in compliance. The manufacturer must undertake appropriate actions on equipment and on any affected product. The records of calibration and verification results must be kept.

Control, measurement and testing equipment shall be used so as to ensure that the measurement uncertainty is known and consistent with required needs in measurement.

Qualification of staff involved in critical operations

Factory staff working on critical operations, defined in each Technical Certification Rules, shall be qualified and the manufacturer shall be able to provide evidences thereof.

On installation site, some critical operations can be also conducted. The installation manual shall describe the exact procedure and confirm that these operations shall be conducted by qualified and authorized staff.

Use of mark logo

The participant shall respect the marking requirements of the present certification manual and of the Technical certification rules if the logo is used on its products and/or services on all the relative documentations

Production instruction documentation

The applicant/participant shall ensure the availability of documented information that defines:

- the characteristics of the products to be produced and/or the activities to be performed
- the results to be achieved when appropriate

Management of suppliers

The applicant/participant shall ensure the quality of the incoming goods (Raw materials and components), supplied for the manufacturing of products concerned by the certification process.

The applicant/participant shall:

- Define the specifications of parts to be supplied (and possibly establish specifications with its suppliers),
- Define its supplier selection criteria,
- Compile and maintain a regularly updated list of its authorized suppliers and maintain records relating to the periodic evaluation of these acceptable suppliers.

Management of non-conforming products

The applicant/participant shall manage the nonconforming products and notably:

- Identify the nonconforming products
- Define the responsibilities and authority to treat these non-conformities.
- Take appropriate actions to control and correct the non-conformity and eliminate its causes.
- Keep records of the actions taken.

Management of customer claims

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

Internal audit and factories audits in the case of multi-site company

The applicant/participant must conduct internal audits and factories audits in the case of multi-site company at scheduled intervals to determine if the quality management system is:

- Compliant with the requirements of the quality management system and this certification manual
- Implemented and maintained in an efficient way.

Records of internal audits and their results must be stored.

II.3. Marking

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

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



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

II.3.1 Display of Eurovent Certified Performance logo on production units

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

Each participant is entitled to display the ECP mark on each production unit of ranges which have been certified. The participant may affix the certification mark at any location thereon satisfactory to him. The ECP mark may be applied as part of nameplate of certified products providing it meets the requirements stated in Certification Manual.

Whenever the participant marks the ductwork elements with an ECP logo, for example by punching, marking with laser or indelible heat-resistant ink, a specific logo comprising the certificate number shall be used. This logo and the related design and proportions requirements are to be obtained from Eurovent Certita Certification marketing department.

Whenever the participant applies the logo on the packaging, the ECP mark shall conform to the design, minimum size and proportions as presented in the Certification Manual and include in the dedicated area (see Certification Manual):

- the short name of the relevant sub-programme the product is certified for;
- the certificate number.

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

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

Whenever the participating company indicates participation in the programme it shall be by displaying the appropriate ECP mark on technical documentation as defined in the Certification Manual (electronic and printed catalogues, websites and specification sheets), carrying ratings or claiming certification of certified ranges.

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

Following the qualification procedure the basic documentation literature shall be submitted for approval to Eurovent Certita Certification. It shall be the responsibility of the participant to ensure compliance of other published literature.

When used in literature containing the certified performance data (technical catalogues and leaflets) the ECP mark shall be used only on products that are declared as part of a certified system. Elements that are not part of the declaration file (DUCT-2) shall be clearly distinguished or presented in a separate document.

The ECP mark shall conform to the design, minimum size and proportions as presented in the Certification Manual.

The ECP mark shall include in the dedicated area (see Certification Manual) the name of the relevant sub-programme the product is certified for or the corresponding short name and certificate number.

III. CERTIFICATION PROCESS

III.1 Admission procedure

III.1.1 Declaration of data

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 Eurovent Certita Certification all information required for the qualification: declaration file DUCT-2 and relevant literature.

All characteristics and performances shall be expressed in SI units.

Submittal of data shall be made by filling in the forms provided by Eurovent Certita Certification as .xls or .xlsx files or by any other tool provided by Eurovent Certita Certification. The forms shall be sent by e-mail to Eurovent Certita Certification within the time limits specified in Certification Schedule (see Appendix – Campaign schedule, if applicable).

The forms can be described as follows (see Appendix B):

- Declaration file DUCT-2 will be used
 - for manufacturing companies (Original Equipment Manufacturer – OEM) to declare ranges, Basic Model Groups (BMG), performance ratings, technical data and production site(s).
 - for Brand Name (BN) companies to identify the corresponding model's number of the original equipment manufacturer
- Technical data sheet DUCT-3 will be used to complete technical description of all raw material or incoming goods for the units selected.

III.1.2 Admissibility of the application

The provisions of the Certification Manual apply.

III.1.3 Implementation of checking operations

III.1.3.1 Initial admission audit

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

In the frame of the qualification procedure, an auditor appointed by Eurovent Certita Certification shall audit the production sites declared by the applicant, i.e. facilities involved in the ductwork elements (fittings and ducts) production (see §III.1.1), as follows:

- In the case of multi-site company, one site designated as “Office” where internal audits data can be checked, where customer complaints can be addressed and where product selection (and testing when appropriate) can be performed;
- A minimum of one production site(s) designated as category “factory” which manufactures at least metallic fittings or plastic components (see Table 1); during the admissibility campaign, each manufacturing process type must be audited.
- A minimum of one production site(s) designated as category “metallic ducts workshop” which manufacture ducts only (see Table 2)

Table 1: Number of sites that manufacture at least metallic fittings or plastic components to be audited

Number of <i>factories</i>	Number of sites audited
$1 \leq \text{Number} \leq 5$	1
$5 < \text{Number} \leq 10$	2
$10 < \text{Number}$	3

No specific audit is carried out in the fitting factories if they are already covered by the ECP DUCT certification.

Table 2: Number of sites that manufacture metallic ducts only to be audited

Number of <i>metallic</i> ducts workshops	Number of sites audited
$1 \leq \text{Number} \leq 5$	1
$5 < \text{Number} \leq 10$	2
$10 < \text{Number} \leq 20$	3
$20 < \text{Number}$	5

No specific audit is carried out in the duct workshops if they are already covered by the ECP DUCT certification.

The duration of the site audit is 1.5 day for the “Office” site and the “factory” audit and 1 day for “metallic ducts workshops” audit (including audit preparation, the audit itself, the report writing and the management of the corrective actions, if relevant). This duration can be adjusted in the case of carrying out a joint audit with other certifications.

For the qualification procedure, audits shall be conducted within the time limitations specified in the notification received from Eurovent Certita Certification.

If audits are not conducted within the time limitations, it is considered as non-application of procedures (see §III.1.3.3.).

Anytime, Eurovent Certita Certification has the right to ask an auditor to conduct an additional audit to one of the applicant’s, subcontractor’s or complementary manufacturer’s production sites.

In case of force majeure (e.g. accidents, labour disputes, natural events, acts of war) which would not allow Eurovent Certita Certification to perform a factory audit, Eurovent Certita Certification can decide to replace it by another mean of verification, to postpone it within a reasonable deadline or to cancel it.

The production site audit will comprise a tour accompanied by a technical expert working at the factory.

After evaluation, a nonconformity is classified as critical when, on the basis of objective evidence, the following cases are identified:

- there is a significant risk to the product conformity with respect to specified requirements;
- there is a significant risk on the quality management system ability to control the product conformity to specified requirements;
- there is systematic or repeated nonconformity to a specified requirement;

Otherwise the nonconformity is classified as not-critical.

In case of nonconformity, the applicant shall be requested to provide Eurovent Certita Certification with the corrective actions report within the deadline specified by the auditor.

The Audit failure treatment consists of the following:

- The applicant shall resolve the nonconformity within the time limitation agreed in the corrective actions report.
- In case of critical nonconformity, the certification may be not granted until the critical nonconformity resolution and the corresponding verification.

III.1.3.2 Selection of units to be tested

In addition to the provisions laid down in the Certification Manual, the following requirements apply: Eurovent Certita Certification shall proceed to the typical ductwork system(s) selection for testing on the basis of its evaluation of the declaration file (DUCT-2) communicated by the applicant.

At least one (1) typical ductwork system per range shall be selected in order to cover the variations declared (see Technical Appendix A.III for non-metallic and Table otherwise).

When an applicant is already holder of a right to use the QB 40 mark for the range he applies for, the corresponding test can be accepted for the size S category on condition that the requirements specified in Technical Appendix A.I are fulfilled and that the test was performed less than 12 months before the application date. When size L category is represented in the range, then typical ductwork system(s) made of size S and size L elements shall be tested in the production facility as shown in Table .

When the sub-programme comprises basic and extended configurations the selection is made on the basic set-up, the extended set-up being selected in addition and upon request (see “basic” and “extended” set-ups and size categories definitions in each relevant Technical Appendix).

Table 3 : Number of typical ductwork systems to be selected for testing

Size categories in the range	Number of typical ductwork system to be tested in the laboratory facility	Number of typical ductwork system to be tested in the production facility
S	1 basic (+1 extended upon request) made of size S elements only	0
S and L	1 basic (+1 extended upon request) made of size S elements only	1 basic (+1 extended upon request) made of size S and size L elements

For the metallic ducts manufacturers using fittings from ECP DUCTS certified ductwork, only one typical ductwork system to be tested in the laboratory facility or in the production facility made of size S and size L elements.

The samples necessary for carrying out the tests may be taken during the audit(s) of the production entity(ies). They must be marked and numbered by the auditor in order to authenticate them later.

In case the sampling cannot be completed as foreseen, including tailor made production, it shall be verified that the products made available for sampling are consistent with regular production, by comparing them to similar products (same or close family/BMG) taken from the production line and/or stock, and/or by comparing production order files/bills of material.

Samples taken are sent in less than 15 days by and under the responsibility of the applicant to the laboratory responsible for performing the tests or to the “office” in case of multi-site company.

III.1.3.3. Tests by the independent laboratory

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

a) General

The tests shall be conducted at the conditions stated in the relevant Technical Appendix A.

Tests are to be conducted at the independent laboratory facility (see §I.4.2.) except when size L category is represented (see Table 3) in which case the test may be conducted at the applicant production facility. In both cases the tests shall be performed by the independent laboratory selected by Eurovent Certita Certification.

Upon completion of the tests on each ductwork system, the laboratory will send the complete report as a .pdf file to Eurovent Certita Certification.

When one or more performance items fail, the test status is considered FAILED and the failure treatment corresponding to test failure (see § III.1.3.3 e) shall be applied.

Eurovent Certita Certification will forward a copy of the report together with the test report result sheet (DUCT-4) and, if applicable, the test rerate sheet (DUCT-5) to the applicant (see Appendix B).

b) Tests at the independent laboratory facility

Deadline for delivery of ductwork elements to the laboratory, together with the technical data sheet (DUCT-3) completed and the payment, is defined in the Certification Schedule (Appendix For the qualifying procedure the deadline is specified in the notification received from Eurovent Certita Certification. If elements are not delivered within the time limitations, it is considered as non-application of procedures (see § III.1.3.4.).

The laboratory shall have the responsibility of unpacking, handling, testing and packing the ductwork elements for shipment.

Before testing, the laboratory shall check dimensions to ensure that the ductwork system corresponds to the selection. If one of the dimensions is not compliant (see standards EN 1505:1998 and EN 1506:2007 for tolerances), the laboratory shall not perform the test and contact Eurovent Certita Certification who shall ask the applicant to send new ductwork elements. If one of the ductwork elements appears damaged, it shall be replaced by the applicant (see §XVIII.17712512□ e) "Initial test failure").

The ductwork system shall be installed in the test facility by the laboratory personnel in accordance with the manufacturer's published installation instructions. The applicant shall therefore provide the laboratory with full information about the installation. The applicant is allowed to attend the preparation and installation of the system, that is until the ductwork system is under pressure, prior to the test and upon request. No applicant's personnel shall be present in the laboratory test facility during the tests.

The applicant has to recover the products maximum eight (8) working weeks after receiving the test reports and results. If the products are not recovered after this delay, the laboratory can destroy them (scrapping) and the corresponding invoice will be sent by Eurovent Certita Certification to the applicant.

c) Tests at the production facility by the independent laboratory staff

When the L size category is represented in the range, the test may be conducted at the applicant production facility by the independent laboratory selected by Eurovent Certita Certification.

In that case, the typical ductwork system to be selected is made of a mix of elements of size S and L in compliance with the relevant Technical Appendix (see also §II.1.3.2). The items are directly sampled from the production line and/or the stock by the auditor who identifies the selected items by a signature.

The laboratory shall provide the measuring instruments.

The laboratory shall authenticate the auditor signature before testing. If one of the elements is not compliant, the laboratory shall not perform the test and contact Eurovent Certita Certification who will communicate appropriate instructions. Whenever necessary an additional visit will be scheduled and invoiced to perform sampling and testing again.

The ductwork system shall be installed by the manufacturer and/or the laboratory in accordance with the manufacturer's published installation instructions. Installation is considered complete once the ductwork system is under pressure and there is no evidence of unintended leakage. The applicant is allowed to attend the test but shall not interfere in the test which is to be conducted by the laboratory.

d) Test conditions

The tests shall be conducted at the conditions stated in Technical Appendices A.

e) Failure treatment

- Reasons of failure

The applicant shall be authorised by Eurovent Certita Certification to examine the reasons of the failure.

- Initial test failure

If one of the elements constituting the ductwork delivered to the laboratory appears to be damaged this is considered as a "Initial test failure". The laboratory shall immediately inform Eurovent Certita Certification and make a notice to the applicant. The applicant shall deliver within four (4) working weeks a new ductwork element, and the typical ductwork shall then be tested according to the availability of the laboratory.

- Test failure

For each test in the laboratory facility that failed, the applicant has four (4) working weeks from the notification of failure to select between the following alternatives:

- (1) Rerate the data by adapting the ratings to the test results.
- (2) Ask for a second test on a new copy of the same ductwork system scheduled by Eurovent Certita Certification according to the availability of the laboratory. If this second test is successful no rerate will be required, otherwise the data will have to be rerated as explained in the rerating procedure (see Technical Appendix A).

When a test that was conducted in the production site facility failed the applicant has four (4) working weeks from the notification of failure to accept rerating. Otherwise this is considered as non-application of procedures and the appropriate action shall be initiated (see Certification Manual).

- Rerating procedure

General Rerating procedure requirements are stated in the dedicated paragraph of the Certification Manual.

Specific rules for rerating are detailed in the relevant Technical Appendix A.

III.1.3.4 Non-application of procedures

The general consequences of non-application of procedures are described in the relevant paragraph of the Certification Manual.

III.1.4. Evaluation and decision

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

If the aforementioned checks prove all the ranges compliance with the requirements specified in the present Technical Certification rules, the certification is granted for the corresponding sub-programme. If not, the procedure for failure treatment shall be applied.

When the applicant appeals to a complementary manufacturer (see §III.1.1), if the latter is also applying for (or already participating to) the relevant certification sub-programme then the certification granting is conditioned to the complementary manufacturer's product certification granting/renewal. Otherwise the complementary manufacturer's facilities involved in the production of the missing ductwork elements are to be accounted for in the facilities to be audited (see III.1.3.1).

The certified data of the certified products are published on the Eurovent Certified Performance (ECP) 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 range (new, certified, deleted or obsolete).

The following data are published for each sub-programme:

- Name of Company
- Trade or brand name
- Certificate number
- Range designation
- Ductwork elements geometry (cross section)
- Ductwork elements rigidity (rigid or semi-rigid as per definition stated in standard EN 12792:2003)
- Air tightness class
- Positive and negative pressure limits
- Maximum service temperature (DUCT-P)
- Minimum service temperature (DUCT-P)
- Resistance to external pressure (DUCT-P)
- Dimensions
- Exhaustive list of ductwork elements falling into the relevant sub-programme scope for each range and sold by the applicant
- Ductwork elements main material and available options
- Ductwork sealing solution(s)
- Ductwork mechanical connection designation(s)
- Exhaustive list of complementary manufacturers when applicable

III.2. Surveillance procedure

The provisions of the Certification Manual apply.

III.2.1. Implementation of surveillance operations

III.2.1.1. Surveillance audit

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

The audit process detailed in the initial audit section (cf. § III.1.3.1) is applicable for the surveillance audit.

III.2.1.2. Selection of units to be tested

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

For the repetition procedure, Eurovent Certita Certification shall select ductwork elements among the declared ranges to test one (1) typical ductwork system.

Whenever possible, a configuration different from that previously tested shall be selected and the typical ductwork system to be tested shall be predominantly the same for all participants.

For ranges that comprise items of size S and L, a rotation will be applied so that testing occurs in the laboratory facility on year N and in the production facility on year N+1.

For participants who are also holders of a right to use the QB40 mark the rotation will be applied so that QB40 tests can be accepted on year N and that specific tests for the ECP mark are conducted in the production facility on year N+1.

If there is one range declared with only one size category represented, the minimum frequency of the tests will be one every 2 years.

III.2.1.3. Surveillance tests

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

The test process detailed in the initial admission test section (cf. § III.1.3.3) is applicable for the surveillance tests.

Eurovent Certita Certification has discretion not to discontinue the certification when a participant provides a definite and acceptable date of supply.

The frequency of the tests of the minimum and maximum service temperature and the resistance to external pressure (DUCT-P) is one every 2 years.

III.2.1.4. Technical and commercial documentation check

The provisions of the Certification Manual apply.

III.2.2. Evaluation and decision

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

Every year, Eurovent Certita Certification checks whether the certified characteristics of the certified products still fulfil the requirements. The certification is renewed at the date specified in the Certification Schedule (see Appendix C) on condition that:

- The previous test campaign (N-1) has been successfully completed;
- The scheduled audits have been performed by the auditor and are successful or the corrective actions plan is considered satisfactory;
- The product sampling has been performed and the payment has been completed.

The company receives then a new certificate and the display of data is maintained on Eurovent Certified Performance (ECP) website. If not, failure treatment shall be applied.

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 entities

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. Additional admission for a new model and/or new range

The provisions of the Certification Manual apply.

III.3.5. Changes concerning the certified product

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

The applicant/participant shall inform Eurovent Certita Certification of any modification of the product portfolio by updating the declaration file (DUCT-2). Non-compliance of the participant is considered as non-application of procedures.

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.

APPENDIX A. TECHNICAL APPENDICES A.I. Rigid Metallic Ductwork Systems with Circular cross-section (DUCT-MC)

A.I.1 Purpose

The purpose of this appendix is to establish specifications for testing and rating of Rigid Metallic Ductwork Systems with Circular cross-section (DUCT-MC) for the related Eurovent Certified Performance (ECP) certification sub-programme.

A.I.2 Complementary technical specifications

- **Size categories**

The present document refers to size categories which are defined as follows:

- Size S (“small”) for cross-sections lower than or equal to 0,08 m²;
- Size L (“large”) for cross-sections between 0,08 m² excluded and 1,23 m² included;

Ductwork elements of dimensions out of these categories are not part of the certification programme scope.

- **Integrated/additional sealing solution**

In the present document a sealing solution is referred to as “integrated” when it is supplied in each delivery as an integral part of the sealing solution or factory installed (see Table).

On the contrary, a sealing solution is said “additional” when applied on the construction/application/installation site (see Table).

For the present DUCT-MC sub-programme the sealing solutions are classified as follows:

Table 4 : Integrated sealing solutions for circular ducts

Integrated sealing solutions for cross-sectional (transverse) joints	Integrated sealing solutions for longitudinal seams
Single (or more) lip(s) rubber sealing ring	Spiral seam
Beaded sleeve joint	Butt weld seam
Flange with gasket	Grooved / Pipe lock / Flat lock seam
Drawband Clamps with gasket	Snap lock seam

Table 5 : Additional / Not integrated sealing solutions for circular ducts

Additional / Not integrated sealing solutions
Tape (peel and seal; pressure sensitive, etc)
Mastic sealant
Liquid sealant

In consequence, ductwork fittings that involve the use of an additional sealing solution on installation site (e.g nozzles) are not part of the present DUCT-MC sub-programme.

- **Air tightness class**

The air tightness classes A to D are defined as per the ductwork classification that appear in the relevant standard: EN 12237:2003 for Metallic circular ducts.

Table 6 : Air tightness classification (according to EN 12237:2003)

Air tightness class	Static gauge pressure limit (p_s) [Pa]		Air leakage limit (f_{max}) [$m^3 \cdot s^{-1} \cdot m^{-2}$]
	Positive	Negative	
A	500	500	$0.027 \times p_t^{0.65} \times 10^{-3}$
B	1000	750	$0.009 \times p_t^{0.65} \times 10^{-3}$
C	2000	750	$0.003 \times p_t^{0.65} \times 10^{-3}$
D	2000	750	$0.001 \times p_t^{0.65} \times 10^{-3}$

A.I.3 Testing requirements

A.I.3.1 Test standard

The tests shall be conducted in accordance with EN 12237:2003 “Ventilation for buildings. Ductwork. Strength and leakage of circular sheet metal ducts” as full tests (i.e performing both leakage and strength tests steps).

A.I.3.2 Composition of the typical ductwork system

The test is to be performed on a typical ductwork system considered representative of the product portfolio content for the range to be certified.

The typical ductwork system boundaries are the distribution box/plenum chamber on the one hand and the junction between sleeve and ductwork on the other hand.

A.I.3.2.a. General requirements

The typical ductwork system criteria, consistent with paragraph 7.1.2 of standard EN 12237:2003, are the following:

- the test sample shall contain a representative variety of duct dimensions, materials and fittings;
- the test section shall include straight ducts of a minimum length of 2.5 m;
- the ductwork surface area to be tested shall be at least 10 m²;
- the ratio (L/A) between the total joint length (L) and ductwork surface area (A) shall be comprised between 1 and 1.5 m⁻¹.

To ensure the test feasibility the overall dimensions are limited as follows:

- the ductwork surface area to be tested shall be limited to 50 m²;
- the ductwork system overall dimensions shall occupy an area of 10 m x 7 m as a maximum;

For the metallic ducts’ manufacturers using fittings from ECP DUCTS certified ductwork, the basic set-up is applicable without Distribution box, *if relevant*, and Technical ductwork products.

A.I.3.2.b. Basic set-up for a ductwork system made of size S elements

To comply with the criteria specified in §A.I.3.2.a, the basic set-up for a ductwork system composed only of size S elements shall comprise the following elements:

- Rigid straight duct elements of circular cross-section:
 - of at least 3 different nominal diameters;
 - with at least one element which length is higher or equal to 2.5 m;

- Fittings:
 - Bends: at least two (2) pieces among the following : 15° or 30° or 45° or 60° or 90° bend, different whenever possible;
 - Branches :
 - at least one (1) piece among the following : 90° angle T-piece or 45° angle T-piece or X-piece or Y-piece or collecting pipe;
 - with diameter change whenever possible;
 - Transformation elements : at least one (1) reducer;
 - Couplings and female couplings (for pieces of identical size);
 - End caps.
- Technical ductwork products: at least one (1) damper or valve or sound attenuator if included in the product portfolio;

A.I.3.2.c. Basic set-up for a ductwork system that mixes elements of sizes L and S

In the case of a typical ductwork system where size L elements are mixed with size S elements, the minimum composition is the following:

- Rigid straight duct elements of circular cross-section:
 - of at least 4 different nominal diameters with as minimum 2 from size S category and 2 from size L category;
 - with at least one element which length is higher or equal to 2.5 m;
- Fittings:
 - Bends :
 - at least one (1) 90° bend from size L category;
 - at least one (1) 45° or 15° or 60° bend from size S category if included in the product portfolio;
 - at least one of the aforementioned bends with sharp corner (“segmental”) if included in the product portfolio;
 - Branches :
 - at least two (2) pieces among the following : 90° angle T-piece or 45° angle T-piece or X-piece or Y-piece or collecting pipe
 - with diameter change whenever possible;
 - Transformation elements :
 - at least one (1) reducer;
 - Couplings and female couplings (for pieces of identical size);
 - Distribution box if included in the product portfolio;
 - End caps.
- Technical ductwork products :
 - at least one (1) damper or valve or sound attenuator if included in the product portfolio;

A.I.3.2.d. Extended set-up

The extended set-up is composed of the basic set-up to which are added the following elements:

- Components fitted with maintenance accessories such as doors and inspection panels;
- Maximum 1 meter long flexible duct with integrated sealed connection meant to connect the basic set-up to air diffusion components such as
 - air terminal devices (grids, diffusers, registers)
 - complementary accessories (equalizing grids)
- Distribution box

The air diffusion components are excluded from the extended set-up and are replaced by end caps.

A.I.3.3 Test pre-requisites

Before testing, the laboratory shall check dimensions to ensure that the elements delivered correspond to the ductwork system selected.

If one of the ductwork elements is not compliant, the laboratory shall not perform the test and contact Eurovent Certita Certification who shall ask the applicant/participant to send a new ductwork element for testing (see also §III.1.3.3 e).

For the metallic ducts manufacturers using fittings from ECP DUCTS certified ductwork, the laboratory shall check only ducts dimensions.

A.I.4 Rating requirements

A.I.4.1. Particular specifications for testing and rating

When testing under positive test pressures that exceed +750 Pa, specific rivets, screws and self-sealing fasteners shall be installed in accordance with the manufacturer's published instructions.

Strength and leakage testing shall be conducted for 5 positive and 5 negative test pressures (p_t) as shown in Table 7 including:

- the negative static gauge pressure limit corresponding to the declared air tightness class (p_{s_neg}) as per Table 6,
- the positive static gauge pressure limit corresponding to the declared air tightness class (p_{s_pos}) as per Table 6 ;

Table 7 : Test pressures according to the declared air tightness class

Class	Test pressures (p_t) in Pa													
A		-500	-400	-300	-200	-100	100	200	300	400	500			
B	-750	-500	-400	-300		-100	100		300		500	750	1000	
C or D	-750	-500	-400	-300		-100	100				500	750	1000	2000

If the design operating pressures (p_{design}) declared by the applicant/participant go beyond the static gauge pressure limits (p_s) the leakage test shall also be conducted for:

- the negative design operating pressure (p_{design_neg});
- and/or
- the positive design operating pressure (p_{design_pos});

A.I.4.2. Optional test

In addition to the basic ductwork system test the applicant/participant can request to test an extended ductwork system as defined in §A.I.3.2.d.

The applicant/participant shall declare specific ratings for this extended ductwork system.

A.I.4.3. Rerating rules

For all the test pressures the following requirements shall be fulfilled to consider that the declared air tightness class rating is accurate:

- The leakage factor (f) shall be lower than the air leakage limit (f_{max})
- The ductwork shall withstand the static pressure limits (p_s) specified in per Table 6 without permanent deformation, or any sudden change in leakage flow rate or test pressure. This is the "strength criteria".

If one of the above requirements is not fulfilled the test status is FAILED. The air tightness class and the static gauge pressure limits have to be rerated.

The new rating proposal will depend on the criteria that failed:

- Case 1: The leakage factor (f) value exceeds the air leakage limit (f_{max}) for one or several test pressure(s) but the strength criteria is fulfilled at all pressures. The leakage factor (f) values are then compared to the air leakage limit (f_{max}) values corresponding to one rating down until the requirement is fulfilled.
- Case 2: $f < f_{max}$ for all test pressures but the ductwork shows a deformation or a sudden change of leakage flow rate or test pressure occurred.
 - The test pressure for which the strength failure occurred is then considered as the new maximum design operating pressure (p_{design_neg} or p_{design_pos}).
 - If the test pressure for which strength failed corresponds to one of the pressures listed in Table 7 then the air tightness class is rated down to a class for which the results at all the test pressures were PASSED.
- Case 3: Both leakage and strength requirements are not fulfilled for one or several test pressures.
 - The test pressure for which the strength failure occurred is then considered as the new maximum design operating pressure (p_{design_neg} or p_{design_pos}).
 - The leakage factor (f) values are compared to the air leakage limit (f_{max}) values corresponding to one rating down until the requirement is fulfilled.

If the ductwork system does not meet at least the class A requirements it is then out of the programme scope and certification cannot be granted/maintained.

Example: The manufacturer claims class C for a typical ductwork system of 10 m² surface area and made of size S elements only. The tests are performed in the laboratory facility.

Table 8: Example of test conclusion

Test Pressure	-750	-500	-400	-300	-100	100	500	750	1000	2000
Measured leakage factor (f)	23	12.1	9.1	6.2	2.1	2.8	14.8	25	36	78
Air leakage limit (f_{max}) for class C	22.5	15	12	9	3	3	15	22.5	30	60
$f < f_{max}$ for class C	NO	YES	YES	YES	YES	YES	YES	NO	NO	NO
Strength criteria for class C	OK	OK	OK	OK	OK	OK	OK	OK	OK	KO

Table 9: Possible rerating

Test Pressure	-750	-500	-400	-300	-100	100	300	500	750	1000
Measured leakage factor (f)	23	12.1	9.1	6.2	2.1	2.8	NC	14.8	25	36
Air leakage limit (f_{max}) for class B	67.5	45	36	27	9	9	27	45	67.5	90
$f < f_{max}$ for class B	YES	YES	YES	YES	YES	YES	-	YES	YES	YES

Both strength and leakage requirements failed at +2000 Pa so class C rating is not accurate. The new rating proposal is class B since:

- The strength test failed at +2000 Pa only so class B, for which maximum test pressure is +1000 Pa, is fulfilled from a strength point of view.
- The leakage factor exceeds class C leakage limit at -750 Pa; +750 Pa and +1000 Pa but class B leakage limit is fulfilled at these pressures.

The manufacturer is asked to either rerate to air tightness class B and static pressure limits [-750Pa ; 1000Pa] or perform a test on a new copy of the same ductwork system (see paragraph III.1.3.3. e).

A.I.5 Certified Performance Items

The following performance characteristics, as defined in paragraph I.3, declared by the applicant/participant shall be verified by tests:

- Air tightness class: A, B, C or D
- Static gauge pressure limits (p_s) [Pa]
- Dimensions

A.I.6 Acceptance criteria

When tested by the independent laboratory, the obtained results shall not differ from the claimed values. The tolerances with respect to the declared ratings are the following:

- Air tightness class: as claimed or better
- Static gauge pressure limits: as claimed (no tolerance)
- Dimensions: as per EN 1506:2007

APPENDIX A TECHNICAL APPENDICES

A.II. Rigid Metallic Ductwork Systems with Rectangular cross-section (DUCT-MR)

A.II.1 Purpose

The purpose of this appendix is to establish specifications for testing and rating of Rigid Metallic Ductwork Systems with Rectangular cross-section (DUCT-MR) for the related Eurovent Certified Performance (ECP) certification sub-programme.

A.II.2 Complementary technical specifications

- **Size categories**

The present document refers to size categories which are defined as follows:

- Size S (“small”) for cross-sections between 0,02 m² and 0.36 m² included;
- Size L (“large”) for cross-sections between 0.36 m² excluded and 4 m² included;

Ductwork elements of dimensions out of these categories are not part of the certification programme scope.

- **Integrated/additional sealing solution**

In the present document a sealing solution is referred to as “integrated” when it is supplied in each delivery as an integral part of the sealing solution or factory installed (see Table 10 and 11)

On the contrary, a sealing solution is said “additional” when applied on the construction/application/installation site (see Table 12).

For the present DUCT-MR sub-programme the sealing solutions are classified as follows:

Table 10 Integrated sealing solutions for rectangular ducts cross-sectional (transverse) joints

Description	Reference in SMACNA Standard
Companion angles flange connection: flange + continuous gasket (or caulk or tack weld if factory applied) + rivet or screw	T-22 ⁽¹⁾
Slide-on or slip-on flange connection (flange + continuous gasket + corner pieces + clamps or cleats)	Slip-on flange ⁽¹⁾
Other flange connection (flange + continuous gasket)	T-24; T-24A; T-25a; T-25b ⁽¹⁾
Welded flange	T-21 ⁽¹⁾

(1) ANSI/SMACNA 006-2006: HVAC Duct Construction Standards - Metal and Flexible, 3rd edition (2005), fig. 2-1

Table 11: Integrated sealing solutions for rectangular ducts longitudinal seam joints

Description	Reference in SMACNA Standard
Pittsburgh lock seam	L-1 ⁽²⁾
Button punch snap lock seam	L-2 ⁽²⁾
Grooved / Pipe lock / Flat lock seam / Double corner seam	L-3 ⁽²⁾
Standing seam	L-4 ⁽²⁾
Single corner seam	L-5 ⁽²⁾

(2) ANSI/SMACNA 006-2006: HVAC Duct Construction Standards - Metal and Flexible, 3rd edition (2005), fig. 2-2

Table 12: Additional / Not integrated sealing solutions for rectangular ducts

Additional / Not integrated sealing solutions
Tape (peal and seal; pressure sensitive...etc)
Caulk / Mastic sealant
Liquid sealant
Following transverse joints ⁽³⁾ : Drive slip, S slip, Hemmed S slip, Double S slip, Standing S slip, Standing seam

(3) Considered as not integrated whenever the final assembly (weld for instance) is to be performed on the construction site. See Figure 2-1 of ANSI/SMACNA 006-2006 Standard for illustrations.

In consequence, ductwork fittings that involve the use of an additional sealing solution on installation site (e.g take-offs) are not part of the present DUCT-MR sub-programme.

- **Air tightness class**

The air tightness classes A to D are defined as per the ductwork classification that appear in the relevant standard: EN 1507:2006 for Metallic rectangular ducts.

Table 13: Air tightness classification (according to EN 1507:2006)

Air tightness class	Air leakage limit (f_{max}) $[m^3 \cdot s^{-1} \cdot m^{-2}]$	Static gauge pressure limits (p_s) [Pa]			
		Negative at all pressure classes	Positive at pressure class		
			1	2	3
A	$0.027 \times p_t^{0.65} \times 10^{-3}$	200	400		
B	$0.009 \times p_t^{0.65} \times 10^{-3}$	500	400	1000	2000
C	$0.003 \times p_t^{0.65} \times 10^{-3}$	750	400	1000	2000
D	$0.001 \times p_t^{0.65} \times 10^{-3}$	750	400	1000	2000

A.II.3 Testing requirements

A.II.3.1 Test standard

The tests shall be conducted in accordance with EN 1507:2006 “Ventilation for buildings. Sheet metal air ducts with rectangular section. Requirements for strength and leakage” as full tests (i.e performing both leakage and strength tests steps).

A.II.3.2 Composition of the typical ductwork system

The test is to be performed on a typical ductwork system considered representative of the product portfolio content for the range to be certified.

The typical ductwork system boundaries are the distribution box/plenum chamber on the one hand and the junction between sleeve and ductwork on the other hand.

A.II.3.2.a General requirements

The typical ductwork system criteria, consistent with paragraph 5.2.1 of standard EN 1507:2006, are the following:

- the test sample shall, whenever possible, contain a representative variety of duct dimensions, materials and fittings.
- the ductwork surface area to be tested shall be at least 10 m².
- the ratio (L/A) between the total joint length (L) and ductwork surface area (A) shall be comprised between 1 and 1.5 m⁻¹.

To ensure the test feasibility the overall dimensions are limited as follows:

- the ductwork surface area to be tested shall be limited to 50 m²;
- the ductwork system overall dimensions shall occupy an area of 10 m x 7 m as a maximum;

A.II.3.2.b Basic set-up for a ductwork system made of size S elements

To comply with the criteria specified in A.II.3.2.a, the basic set-up for a ductwork system composed only of size S elements shall comprise the following elements:

- Rigid straight single-wall duct elements of rectangular cross-section:
 - of at least 3 different nominal sizes (a x b);
 - with a mix of beaded ducts and cross broken ducts whenever applicable;
- Fittings:
 - Bends:
 - at least two (2) pieces among the following: 45° or 90° bend, different whenever possible;
 - at least one (1) S-bend or “offset” if included in the product portfolio;
 - at least one of the aforementioned bends with sharp corner (“square throat bend”) whenever possible;
 - Branches:
 - at least one (1) piece among the following: T-piece or X-piece or Split-piece;
 - Transformation elements: at least one (1) taper or rect-to-round transition;
 - End covers.
- Technical ductwork products: at least one (1) damper or valve or sound attenuator if included in the product portfolio;

A.II.3.2.c Basic set-up for a ductwork system that mixes elements of sizes L and S

In the case of a typical ductwork system where size L elements are mixed with size S elements, the minimum composition is the following:

- Rigid straight single-wall duct elements of rectangular cross-section:
 - of at least 4 different nominal sizes (a x b) with as minimum 2 from size S category and 2 from size L category;
 - with a mix of beaded ducts and cross broken ducts whenever applicable;
- Fittings:
 - Bends:
 - at least two (2) pieces among the following: 45° or 90° bend, different whenever possible;
 - at least one (1) S-bend or “offset” if included in the product portfolio;
 - at least one of the aforementioned bends with sharp corner (“square throat bend”) whenever possible;
 - Branches:
 - at least one (1) piece among the following: T-piece or X-piece, different whenever possible;
 - Transformation elements:
 - at least one (1) taper or rect-to-round transition;
 - End covers.
- Technical ductwork products:
 - at least one (1) damper or valve or sound attenuator if included in the product portfolio;

A.II.3.2.d Extended set-up

The extended set-up is composed of the basic set-up to which are added the following elements:

- Components fitted with maintenance accessories such as doors and inspection panels;
- Maximum 1 meter long flexible duct with integrated sealed connection meant to connect the basic set-up to air diffusion components such as
 - air terminal devices (grids, diffusers, registers)
 - complementary accessories (equalizing grids)

The air diffusion components are excluded from the extended set-up and are replaced by end caps.

A.II.3.3 Test pre-requisites

Before testing, the laboratory shall check dimensions to ensure that the elements delivered correspond to the ductwork system selected.

If one of the ductwork elements is not compliant, the laboratory shall not perform the test and contact Eurovent Certita Certification who shall ask the applicant/participant to send a new ductwork element for testing (see § III.1.3.3 e).

A.II.4 Rating requirements

A.II.4.1 Particular specifications for testing and rating

When testing under positive test pressures that exceed +750 Pa, the assembly shall be done using as many clamps as specified by manufacturers in their assembly procedure.

The leakage testing shall be conducted on the typical ductwork system for 5 positive and 5 negative test pressures (p_t) as shown in Table 1 including:

- the negative static gauge pressure limit corresponding to the declared air tightness class (p_{s_neg}) as per Table 13;
- the positive static gauge pressure limit corresponding to the declared air tightness class (p_{s_pos}) as per Table 13;

Table 1: Test pressures according to the declared ratings

C_P	$CI1$			$CI2$		$CI3$	
C_{AT}	A	B	C or D	B	C or D	B	C or D
Test pressures (p_t) in Pa			-750		-750		-750
		-500	-500	-500	-500	-500	-500
		-400	-400	-400	-400	-400	-400
		-300	-300	-300	-300	-300	-300
	-200	-200		-200		-200	
	-150						
	-125						
	-100	-100	-100	-100	-100	-100	-100
	-50						
	50						
	100	100	100	100	100	100	100
		150	150				
	200	200	200	200	200		
	300	300	300				
	400	400	400	400	400	400	400
				750	750	750	750
				1000	1000	1000	1000
					2000	2000	

If the design operating pressures (p_{design}) declared by the applicant/participant go beyond the static gauge pressure limits (p_s) the leakage test shall also be conducted for the negative ($p_{\text{design_neg}}$) and/or positive design operating pressures ($p_{\text{design_pos}}$).

The strength testing shall be performed as per §5.3 of standard EN 1507:2006 applying the negative static gauge pressure limit (p_{s_neg}), and the negative design operating pressure ($p_{\text{design_neg}}$) if beyond p_{s_neg} , on the test object.

A.II.4.2. Optional test

In addition to the basic ductwork system test the applicant/participant can request to test an extended ductwork system as defined in §A.II.3.2.d.

The applicant/participant shall declare specific ratings for this extended ductwork system.

A.II.4.3. Rerating rules

For all the test pressures the following requirements shall be fulfilled to consider that the declared air tightness class rating is accurate:

- The leakage factor (f) shall be lower than the air leakage limit (f_{max})
- The ductwork shall withstand the static pressure limits (p_s) specified in Table 13 without permanent deformation, or any sudden change in leakage flow rate or test pressure. This is the "strength criteria".

If one of the above requirements is not fulfilled the test status is FAILED. The air tightness class and the static gauge pressure limits have to be rerated.

The new rating proposal will depend on the criteria that failed:

- Case 1: The leakage factor (f) value exceeds the air leakage limit (f_{max}) for one or several test pressure(s) but the strength test status is PASSED. The leakage factor (f) values are then compared to the air leakage limit (f_{max}) values corresponding to one pressure class down until the requirement is fulfilled for the same air tightness class as a first step and then for one air tightness class down if necessary.
- Case 2: $f < f_{\text{max}}$ for all test pressures but the strength test status is FAILED:
 - If the failure occurred for the negative static gauge pressure limit (p_{s_neg}) the air tightness class is directly rated down of one class.
 - If the failure occurred for the negative design operating pressure ($p_{\text{design_neg}}$) the technical documentation will have to be modified with the static gauge pressure limits as new design operating pressures.
- Case 3: Both leakage and strength tests are FAILED:
 - The leakage factor (f) values are compared to the air leakage limit (f_{max}) values as for Case 1.
 - The new maximum design operating pressures are the ones corresponding to the new air tightness class rating.

If the ductwork system do not meet at least the class A requirements it is then out of the programme scope and certification cannot be granted/maintained.

Example: The manufacturer claims air tightness class C and pressure class 2 for a typical ductwork system of 10 m² surface area and made of size S elements only. The tests are performed in the laboratory facility.

Table 2: Example of test conclusion

Test Pressure	-750	-500	-400	-300	-100	100	200	400	750	1000
Measured leakage factor (f)	23	12.1	9.1	6.2	2.1	2.8	5.9	12.4	25	36
Air leakage limit (f _{max}) for C _{AT} C/C _P 2	22.5	15	12	9	3	3	6	12	22.5	30
f < f _{max}	NO	YES	YES	YES	YES	YES	YES	NO	NO	NO
Strength test	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3: Possible rerating

Test Pressure	-500	-400	-300	-200	-100	100	200	400	750	1000
Measured leakage factor (f)	12.1	9.1	6.2	N.C	2.1	2.8	5.9	12.4	25	36
Air leakage limit (f _{max}) for C _{AT} B/C _P 2	67.5	45	36	27	9	9	18	36	67.5	90
f < f _{max}	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Both strength and leakage requirements failed at -750 Pa so class C rating is not accurate:

- The new air tightness class rating proposal is class B since the leakage factor exceeds class C leakage limit at +400 Pa; +750 Pa and +1000 Pa but class B leakage limit is fulfilled at these pressures.
- The pressure class is then maintained at Class 2.
- The new static gauge pressure limits are -500 Pa (p_{s_neg}) and 1000 Pa (p_{s_pos})
- The new maximum design operating pressures are -500 Pa (p_{design_neg}) and 1000 Pa (p_{design_pos})

The manufacturer is therefore asked to either rerate the values as stated above or perform a test on a new copy of the same ductwork system (see paragraph III.1.3.3. e).

A.II.5 Certified Performance Items

The following performance characteristics, as defined in paragraph I.3, declared by the applicant/participant shall be verified by tests:

- Air tightness class: A, B, C or D
- Static gauge pressure limits (p_s) [Pa]
- Dimensions

A.II.6 Acceptance criteria

When tested by the independent laboratory, the obtained results shall not differ from the claimed values. The tolerances with respect to the declared ratings are the following:

- Air tightness class: as claimed or better
- Static gauge pressure limits: as claimed (no tolerance)
- Dimensions: as per EN 1505:1998

APPENDIX A TECHNICAL APPENDICES

A.III. Semi-rigid non-metallic ductwork systems predominantly made of plastics (DUCT-P)

A.III.1 Purpose

The purpose of this appendix is to establish specifications for testing and rating of Semi-rigid non-metallic ductwork systems predominantly made of plastics (DUCT-P) for the related Eurovent Certified Performance (ECP) certification sub-programme.

A.III.2 Complementary technical specifications

- **Integrated/additional sealing solution**

In the present document a sealing solution is referred to as “integrated” when it is supplied in each delivery as an integral part of the sealing solution or factory installed (cf. Table 4).

On the contrary, a sealing solution is said “additional” when applied on the construction /application/installation site (cf. Table 5).

For the present DUCT-P sub-programme the sealing solutions are classified as follows:

Table 4: Integrated sealing solutions

Integrated sealing solutions for cross-sectional (transverse) joints
Seal ring
Clamp

Table 5: Additional / Not integrated sealing solutions

Additional / Not integrated sealing solutions
Tape (peal and seal; pressure sensitive...etc)

In consequence, ductwork fittings that involve the use of an additional sealing solution on installation site are not part of the present DUCT-P sub-programme.

- **Air tightness class**

The air tightness classes A to D are defined as per the ductwork classification that appear in the relevant standard: EN 17192:2018:

Table 19: Air tightness classification for Semi-Rigid Non-Metallic Ductwork

Air tightness class		Air leakage limit (f_{max}) [$m^3 \cdot s^{-1} \cdot m^{-2}$]
<i>Old</i>	<i>New</i>	
	ATC 7	Not classified
	ATC 6	$0.0675 \times p_t^{0.65} \times 10^{-3}$
A	ATC 5	$0.027 \times p_t^{0.65} \times 10^{-3}$
B	ATC 4	$0.009 \times p_t^{0.65} \times 10^{-3}$
C	ATC 3	$0.003 \times p_t^{0.65} \times 10^{-3}$
D	ATC 2	$0.001 \times p_t^{0.65} \times 10^{-3}$
	ATC 1	$0.00033 \times p_t^{0.65} \times 10^{-3}$

A.III.3 Testing requirements

A.III.3.1 Test standard

The tests shall be conducted in accordance with EN 17192: 2008 "Ventilation for buildings. Ductwork. Non-metallic - ductwork - Requirements and test methods" as full tests.

The tests shall be conducted in the independent testing laboratory facility.

The test samples shall be conditioned in air at the test temperature for at least 24 hours prior to testing. All tests shall be carried out at an ambient temperature of 20 ± 3 °C.

A.III.3.2 Composition of the typical ductwork system

The test is to be performed on a typical ductwork system considered representative of the product portfolio content for the range to be certified.

The typical ductwork system boundaries are the distribution box/plenum chamber/manifold on the one hand and the terminal adaptor (valve or floor grille adaptor) on the other hand, both included.

A.III.3.2.a General requirements

The general requirements are the following:

- the test sample shall contain a representative variety of duct dimensions and fittings;
- the test section shall include straight ducts of a minimum length of 2.5 m;
- the ductwork surface area to be tested shall be at least 3 m²;
- the ratio (L/A) between the total joint length (L) and ductwork surface area (A) shall be comprised between 0.4 and 0.6 m⁻¹ included.

To ensure the test feasibility the ductwork system overall dimensions shall occupy an area of 10 m x 7 m as a maximum.

A.III.3.2.b Set-up for ductwork of circular cross-section

To comply with the criteria specified in §A.III.3.2.a, the set-up shall comprise the following elements:

- Semi-Rigid straight duct elements of circular cross-section:
 - with at least one element which length is higher or equal to 2.5 m;
- Fittings:
 - Bends: at least two (2) 90° bends with one (1) horizontal and one (1) vertical whenever possible;
 - Converging / diverging junctions: at least one (1) piece among the following: 90° angle T-piece or Y-piece;
 - Straight connectors or adaptators ;
 - Distribution box/plenum chamber/manifold or collecting pipe;
 - Terminal adaptor (valve or floor grille adaptor);
 - Closing covers.
- Technical ductwork products :
 - at least one (1) air flow restrictor or regulator if included in the product portfolio;

A.III.3.2.c Set-up for ductwork of semi-circular cross-section

To comply with the criteria specified in §A.III.3.2.a, the set-up shall comprise the following elements:

- Semi-Rigid straight duct elements of semi-circular cross-section:
 - with at least one element which length is higher or equal to 2.5 m;
- Fittings:
 - Bends: at least two (2) 90° bends with one (1) horizontal and one (1) vertical whenever possible;
 - Converging / diverging junctions: at least one (1) piece among the following: 90° angle T-piece or Y-piece;
 - Straight connectors or adaptators ;
 - Distribution box/plenum chamber/manifold or collecting pipe;
 - Terminal adaptator (valve or floor grille adaptator);
 - Closing covers.
- Technical ductwork products:
 - at least one (1) air flow restrictor or regulator if included in the product portfolio;

A.III.3.2.d Set-up for ductwork of mixed circular and semi-circular cross-sections

To comply with the criteria specified in § A.III.3.2.a, the set-up shall comprise the following elements:

- Semi-Rigid straight duct elements:
 - of both circular and semi-circular cross-section whenever compatible;
 - with at least one element which length is higher or equal to 2.5 m;
- Fittings:
 - Bends : at least two (2) 90° bends with one (1) horizontal and one (1) vertical whenever possible;
 - Converging / diverging junctions: at least one (1) piece among the following : 90° angle T-piece or Y-piece;
 - Transformation elements : at least one (1) circular/semi-circular transition piece ;
 - Straight connectors or adaptators ;
 - Distribution box/plenum chamber/manifold or collecting pipe;
 - Terminal adaptator (valve or floor grille adaptator);
 - Closing covers.
- Technical ductwork products:
 - at least one (1) air flow restrictor or regulator if included in the product portfolio;

A.III.3.3 Test pre-requisites

Before testing, the laboratory shall check dimensions to ensure that the elements delivered correspond to the ductwork system selected.

If one of the ductwork elements is not compliant, the laboratory shall not perform the test and contact Eurovent Certita Certification who shall ask the applicant/participant to send a new ductwork element for testing (see also § III.1.3.3. e).

A.III.3.4 Selection for testing: particular rules for DUCT-P sub-programme

In the frame of the qualification procedure two (2) typical ductwork systems shall be tested. The selection will be done as follows:

- One (1) system selected per ductwork cross-section type (circular or semi-circular)
- Each of the two (2) systems corresponding to a different nominal size if available in the portfolio

In the frame of the repetition procedure, one (1) typical ductwork system shall be tested.

A rotation will be foreseen so that each type of set-up (circular cross section, semi-circular cross section, mixed cross sections) is tested in turn. If there is only one type of cross section in the product portfolio the minimum frequency of tests is once every two years.

In any case the nominal size of the ductwork will change from one test to another.

A.III.4 Rating requirements

A.III.4.1. Particular specifications for testing and rating

The ductwork system shall be installed by the laboratory with as many mounting clips as specified in the manufacturer's documentation.

A.III.4.1.a Air tightness class

Leakage testing shall be conducted in accordance with standards EN 17192: 2018 "Ventilation for buildings - Ductwork - Non-metallic ductwork - Requirements and test methods" and EN 12237:2003 "Ventilation for buildings. Ductwork. Strength and leakage of circular sheet metal ducts" for 5 positive and 5 negative test pressures (p_t), defined according to declared positive and negative design operating pressures (p_{design}), as shown in Table 20 and Table 21.

Table 20 : Positive test pressures

p_{design_pos}	Positive test pressures (p_t) in Pa										
200	20	50	100	150	200						
250		50	100	150	200	250					
300		50	100		200	250	300				
400		50	100		200		300	400			
500		50			200		300	400	500		
1000		50			200		300		500	1000	
2000		50			200				500	1000	2000

Table 21 : Negative test pressures

p_{design_neg}	Negative test pressures (p_t) in Pa									
-200						-200	-150	-100	-50	-20
-250					-250	-200	-150	-100	-50	
-300				-300	-250	-200		-100	-50	
-400			-400	-300		-200		-100	-50	
-500	-500	-400	-300			-200			-50	

A.III.4.1.b Minimum and maximum service temperatures

The ductwork elements shall be exposed to the minimum and maximum service temperatures as declared by the manufacturer for a minimum of 24 hours. After the test, the ductwork elements shall not have any visible cracks or more than 2% deformation of all relevant dimensions of the duct for the intended function when the ductwork component has reached the ambient temperature (20 +/-3°C).

A.III.4.1.c Resistance to external pressure

The test specimen shall be laid on a horizontal metal plate, which has a length of $\geq 300\text{mm}$ and a width ≥ 1.5 times the test specimen.

A force shall be applied vertically on five (5) ductwork sections using a metal plate of more than 250 mm long and which width is $10\text{ mm} \pm 0.5\text{mm}$.

The force shall be applied at the appropriate deformation speed as indicated in Table 22 below:

Table 22: Deformation speed

Nominal height of duct (mm)	Deformation speed (mm/min)
$h \leq 100$	$2 \pm 0,1$
$100 < h \leq 200$	$5 \pm 0,25$

The force shall be applied increasingly until the ductwork section height has decreased by 3%. The applied force values (F_1, F_2, F_3, F_4, F_5) shall be recorded. The average force shall be calculated and rounded down to the nearest ten, giving the resistance to pressure value F .

A.III.4.2. Rating rules

A.III.4.2.a Air tightness class

For all the test pressures the following requirements shall be fulfilled to consider that the declared air tightness class rating is accurate:

- The leakage factor (f) shall be lower than the air leakage limit (f_{\max})
- The ductwork shall withstand the test pressures (p_{test}) specified in Table 20 and Table 21 without permanent deformation, or any sudden change in leakage flow rate or test pressure. This is the "strength criteria".

If one of the above requirements is not fulfilled the test status is FAILED.

The resulting action to be undertaken will depend on the criteria that failed:

- Case 1: The leakage factor (f) value exceeds the air leakage limit (f_{\max}) for one or several test pressure(s) but the strength criteria is fulfilled. The leakage factor (f) values are then compared to the air leakage limit (f_{\max}) values corresponding to one rating down until the requirement is fulfilled to obtain the new air tightness class rating.
- Case 2: $f < f_{\max}$ for all test pressures but the ductwork shows a deformation or a sudden change of leakage flow rate or test pressure occurred. This is considered as a component failure and shall be treated as such (see § III.1.3.3. e).

If the ductwork system do not meet at least the class A requirements it is then out of the programme scope and certification cannot be granted/maintained.

Example: The applicant/participant claims air tightness class C or ATC 3 for a typical ductwork system of 3 m² surface area and which design operating pressures are -200/+200Pa.

Table 23: Example of test conclusion

Test Pressure	-200	-150	-100	-50	-20	20	50	100	150	200
Measured leakage factor (f)	1.81	1.34	0.82	0.37	0.14	0.15	0.38	0.83	1.36	1.83
Air leakage limit (f _{max}) for class C	1.80	1.35	0.90	0.45	0.18	0.18	0.45	0.90	1.35	1.80
f < f _{max} for class C	NO	YES	YES	YES	YES	YES	YES	YES	NO	NO
Strength criteria	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

Table 24: Possible rerating

Test Pressure	-200	-150	-100	-50	-20	20	50	100	150	200
Measured leakage factor (f)	1.81	1.34	0.82	0.37	0.46	0.47	0.38	0.83	1.36	1.83
Air leakage limit (f _{max}) for class B	5.40	4.05	2.70	1.35	0.54	0.54	1.35	2.70	4.05	5.40
f < f _{max} for class B	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

The leakage factor exceeds class C leakage limit at -200 Pa, +150 Pa and +200 Pa but class B leakage limit is fulfilled at these pressures.

The applicant/participant is therefore asked to either rerate to air tightness class B or perform a test on a new copy of the same ductwork system (see § III.1.3.3. e).

A.III.4.2.b Design operating pressures

The manufacturer is asked to rerate to design operating pressures for which the strength criteria of the leakage test was passed (see § III.1.3.3. e).

A.III.4.2.c Minimum and maximum service temperatures

After the test, if the ductwork elements present any visible cracks or more than 2% deformation then the applicant/participant shall declare new temperature values. Eurovent Certita Certification invoices and schedules a second test on a new copy of the same ductwork system to confirm the new ratings.

A.III.4.2.d Resistance to external pressure

In case of test failure regarding resistance to external pressure, the force F shall be rerated to the average of the applied force values (F₁, F₂, F₃, F₄, F₅) rounded down to the nearest ten.

A.III.5 Certified Performance Items

The following performance characteristics, as defined in paragraph I.3, declared by the applicant/participant shall be verified by tests:

- Air tightness class: A, B, C or D – ATC1 to ATC7
- Positive and negative design operating pressures (p_{design}) [Pa]
- Minimum and maximum service temperatures [°C]
- Resistance to external pressure: force F [N]

A.III.6 Acceptance criteria

When tested by the independent laboratory, the obtained results shall not differ from the claimed values. The tolerances with respect to the declared ratings are the following:

- Air tightness class: as claimed or better
- Positive and negative design operating pressures: as claimed (no tolerance)
- Minimum service temperature: as claimed (no tolerance)
- Maximum service temperature: as claimed (no tolerance)
- Resistance to external pressure: ±10%

APPENDIX B. FORMS Form DUCT-1 : Legal dossier

CERTIFICATION PROGRAMME FOR VENTILATION DUCTS
LEGAL DOSSIER
This response form shall be sent back by <i>e-mail</i> to EUROVENT CERTITA CERTIFICATION <u>together with the signed license agreement.</u>

Date : _____ Name and company : _____ Signature :

According to the document ECP-19-2020, you are asked to select one of the following alternatives:

	OEM of fittings and ducts, owning all facilities involved in the production of the ductwork elements sold by my company. (case 1)
	OEM Daughter company that manufacturers fittings and ducts, sold by the daughter company. (case 1bis)
	OEM of fittings and ducts, with at least one supplier facility involved in the production of the ductwork elements sold by my company. (case 2)
	OEM of fittings only, with at least one complementary manufacturer for ducts signatory of an agreement with my company as specified below. (case 3)
	OEM of ducts only, with at least one complementary manufacturer for fittings signatory of an agreement with my company as specified below. (case 4)
	Brand name - A distributor of a product with a Eurovent certified component can benefit from certification of the component under its own brand.

The present form is to be accompanied with:

- the exhaustive list of the facilities involved in the production of the ductwork elements with at least the following information city, country, owner (Company of the OEM that applies for certification, or company of the supplier / complementary manufacturer whenever applicable).
- A copy of the agreement signed between the applicant and the complementary manufacturer(s), whenever applicable. This agreement shall:
 - specify clearly that the applicant is authorized by the complementary manufacturer to communicate about the performances of a system comprising its products.
 - authorize Eurovent Certita Certification to audit the facilities involved in the complementary ductwork elements production according to the rules specified in § III.1.3.1. of ECP 19-2020.
 - include a commitment from the complementary manufacturer not to use the ECP mark unless he is himself applicant/participant to the DUCT certification programme.

B.II. Form DUCT-2: Declaration file

The declaration file (form DUCT-2) to be filled in shall be sent by EUROVENT CERTITA CERTIFICATION to:

- applicants who have signed the license agreement and returned the form DUCT-1 duly completed,
- participants on an annual basis before the deadline specified in Appendix C.

A template will be available for information and upon request.

B.III. Form DUCT-3: Technical data sheet (TDS)

The Technical Data Sheet (form DUCT-3) to be filled in shall be sent by EUROVENT CERTITA CERTIFICATION to applicants/participants who have returned the form DUCT-2 duly completed.

A template will be available for information and upon request.

B.IV. Form DUCT-4: Test report result sheet

The Test report result sheet (form DUCT-4) shall be sent by EUROVENT CERTITA CERTIFICATION to applicants/participants together with the test report.

A template will be available for information and upon request.

B.VI. Form DUCT-5: Test rerate form

CERTIFICATION PROGRAMME FOR VENTILATION DUCTS
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<u>RESPONSE FORM AFTER FAILURE ON TESTED UNIT</u>
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<p>This response form shall be sent back by <i>e-mail</i> to EUROVENT CERTITA CERTIFICATION <u>within one month maximum</u>. Without news from you within this delay, we will rerate performances and our website will be automatically updated with rerated performances.</p>
--

Date : _____ Your name : _____ Signature :

According to the document ECP-19-2020, you are asked to select one of the following alternatives:

Ask for a second test in the laboratory facility, i.e. on another copy of the same typical ductwork system.

Rerate the ratings in line with test results

B.VII. Help for identification of the applicable case to fill in form DUCT-2

The list of practical cases presented hereafter is non-exhaustive. The purpose of this section is to help applicants identifying their own situation so that the declaration file (DUCT-2) is filled in with accuracy and in compliance with the rules from the start.

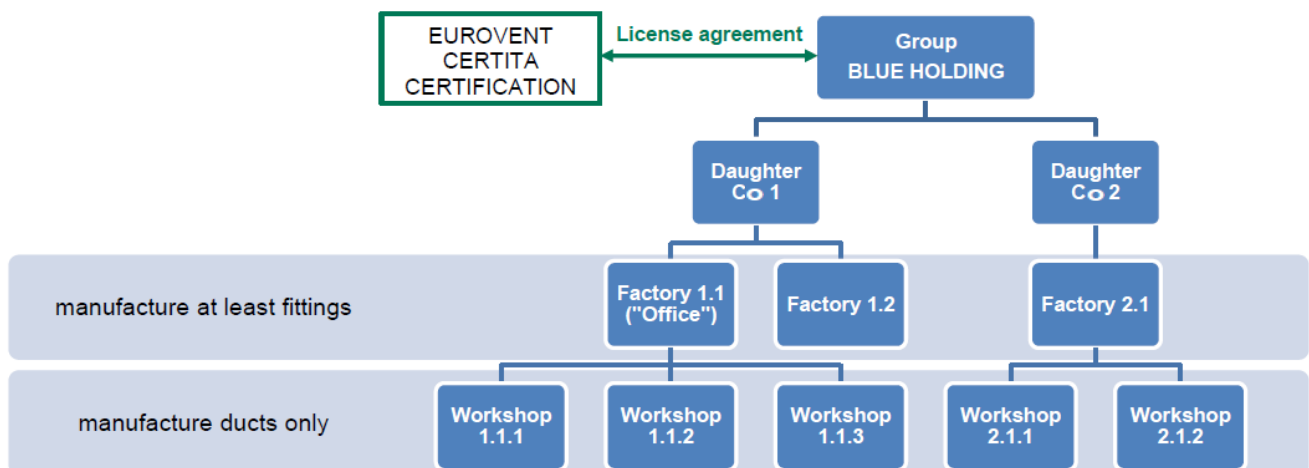
B.VII.1. Case 1 : OEM of fittings and ducts, owning all facilities involved in the production of the ductwork elements sold by his own company.

In the case represented by Figure 1, the Group BLUE HOLDING applies for certification. The form DUCT-1 mentions that the Group BLUE HOLDING is manufacturer of all the fittings and ducts sold under its own brand (neither suppliers nor complementary manufacturers to declare).

In the declaration file (DUCT-2) appear all the ductwork elements falling into the scope and sold by the BLUE HOLDING Group under its own brand:

- straight ducts, manufactured in workshops 1.1.1, 1.1.2, 1.1.3, 2.1.1 and 2.1.2 and possibly in some of the factories.
- fittings, manufactured in factories 1.1, 1.2 and 2.1

Figure 1 : Case 1



The total number of fittings factories involved in the production is 3 (1.1, 1.2 and 2.1) and the total number of duct workshops is 5 (1.1.1, 1.1.2, 1.1.3, 2.1.1 and 2.1.2). As the factory 1.1 is the "office" it has to be audited each year so according to the rules displayed in § III.1.3.1 an example of schedule for the audits could be:

- On year N : factory 1.1 and factory 1.2 (1 day audit) + workshop 2.1.1
- On year N+1 : factory 1.1 and factory 2.1 (1 day audit) + workshop 1.1.3
- On year N+2 : factory 1.1 (1 day audit) + workshop 1.1.2
- On year N+3 : factory 1.1 and factory 1.2 (1 day audit) + workshop 2.1.2
- On year N+4 : factory 1.1 and factory 2.1 (1 day audit) + workshop 1.1.1
- ...

In case 1 the certificate mentions explicitly the BLUE HOLDING Group as owner of the certificate and all the ductwork elements listed in declaration file (DUCT-2) appear on the ECP website.

B.VII.2. Case 1 bis : OEM Daughter company that manufacturers fittings and ducts, sold by the daughter company.

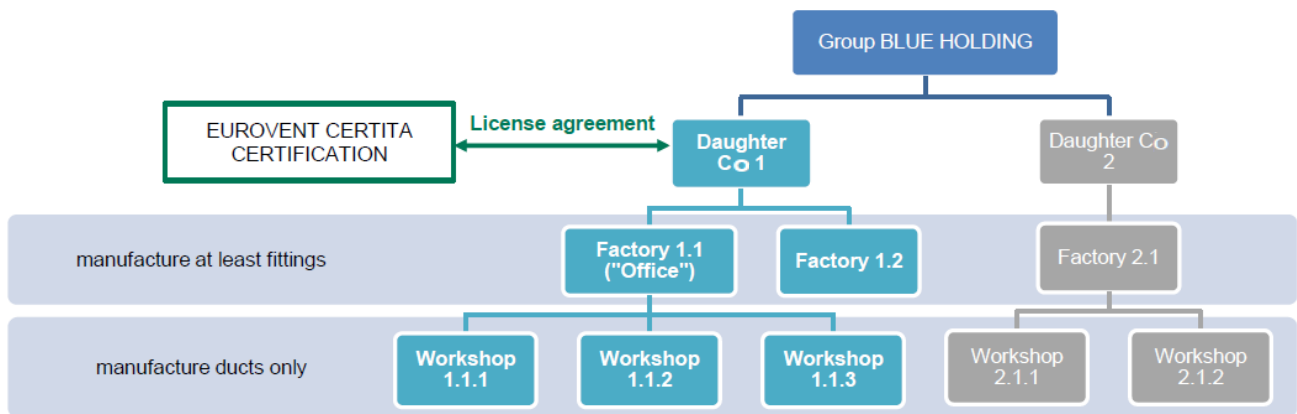
In the case represented by Figure 2, the Group BLUE HOLDING does not apply for certification. This is the Daughter Company 1 that applies. The form DUCT-1 mentions that the Daughter Company 1 is manufacturer of all the fittings and ducts sold under its own brand (neither suppliers nor complementary manufacturers to declare).

In case 1 bis the Daughter Company 2 has no right to claim certification of its products. The certificate mentions explicitly the Daughter Company 1 as owner of the certificate (see Certification Manual for further details about group/daughter companies' applications.)

In the declaration file (DUCT-2) appear all the ductwork elements falling into the scope and sold by the Daughter Company 1 under its own brand:

- straight ducts, manufactured in workshops 1.1.1, 1.1.2 and 1.1.3 and possibly in some of the factories owned by Daughter Company 1.
- fittings, manufactured in factories 1.1 and 1.2 owned by Daughter Company 1

Figure 2: Case 1 bis



The total number of fittings factories involved in the production is 2 (1.1 and 1.2) and the total number of duct workshops is 3 (1.1.1, 1.1.2 and 1.1.3). As the factory 1.1 is the "office" it has to be audited each year so according to the rules displayed in § III.1.3.1. an example of schedule for the audits could be:

- On year N : factory 1.1 and factory 1.2 (1 day audit each) + workshop 1.1.1 (0.5 day audit)
- On year N+1 : factory 1.1 (1 day audit) + workshop 1.1.3 (0.5 day audit)
- On year N+2 : factory 1.1 and factory 1.2 (1 day audit each) + workshop 1.1.2 (0.5 day audit)

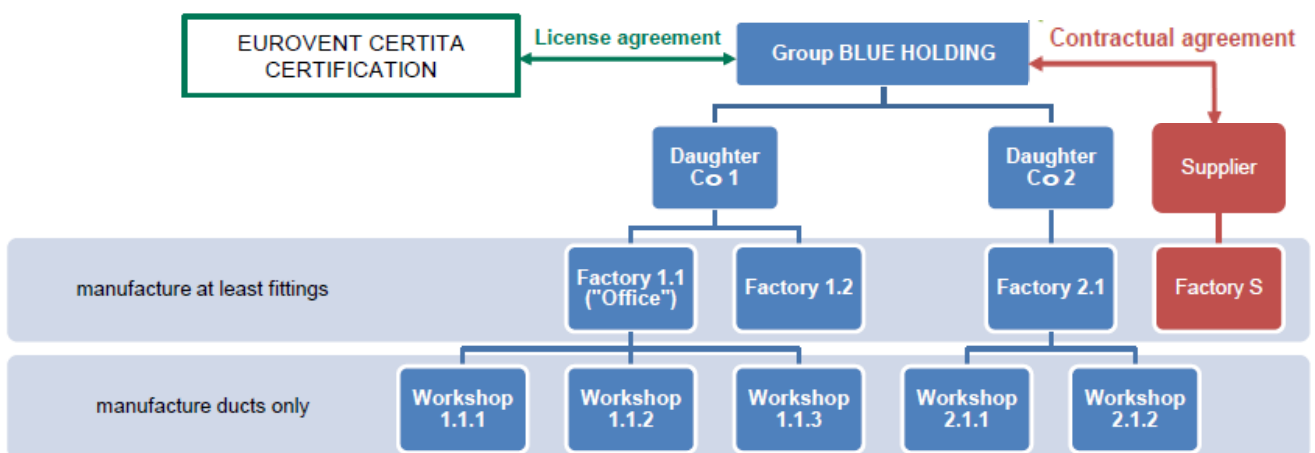
B.VII.3. Case 2 : OEM of fittings and ducts, with at least one supplier facility involved in the production of the ductwork elements sold by his own company

In the case represented by Figure 3, the Group BLUE HOLDING applies for certification. The form DUCT-1 mentions that the Group BLUE HOLDING manufactures fittings and ducts but appeals also to one supplier (“supplier S”) with one fitting factory (“Factory S”).

In the declaration file (DUCT-2) appear all the ductwork elements falling into the scope and sold by the BLUE HOLDING Group under its own brand:

- straight ducts, manufactured in workshops 1.1.1, 1.1.2, 1.1.3, 2.1.1 and 2.1.2 and possibly in some of the factories.
- fittings, manufactured in
 - factories 1.1, 1.2 and 2.1 that are owned by the BLUE HOLDING Group
 - factory S that is owned by the supplier S

Figure 3: case 2



The total number of fittings factories involved in the production is 4 (1.1, 1.2, 2.1 and S) and the total number of duct workshops is 5 (1.1.1, 1.1.2, 1.1.3, 2.1.1 and 2.1.2). As the factory 1.1 is the “office” it has to be audited each year so according to the rules displayed in § III.1.3.1. an example of schedule for the audits could be:

- On year N : factory 1.1 and factory S (1 day audit each) + workshop 2.1.1 (0.5 day audit)
- On year N+1 : factory 1.1 and factory 2.1 (1 day audit each) + workshop 1.1.3 (0.5 day audit)
- On year N+2 : factory 1.1 and factory 1.2 (1 day audit each) + workshop 1.1.2 (0.5 day audit)
- On year N+3 : factory 1.1 and factory S (1 day audit each) + workshop 2.1.2 (0.5 day audit)
- On year N+4 : factory 1.1 and factory 2.1 (1 day audit each) + workshop 1.1.1 (0.5 day audit)
- ...

In case the supplier does not participate to the certification programme, the factory S is audited because it is a site involved in the production of the elements constituting the certified ductwork system sold under the BLUE HOLDING Group brand. In that extent the factory S city and country will be listed as for the other production sites on the ECP certificate. The supplier S has no right to claim certification of its fittings since

- this is the whole ductwork system which is certified, not the components
- the certificate mentions explicitly the BLUE HOLDING Group as owner of the certificate

all the ductwork elements listed in declaration file (DUCT-2) appear on the ECP website.

In case the supplier participates to the certification programme, only the fittings factories (1.1, 1.2, and 2.1) and duct workshops (1.1.1, 1.1.2, 1.1.3, 2.1.1 and 2.1.2) are to be audited in the frame of BLUE HOLDING Group application for certification. As the factory 1.1 is the “office” it has to be audited each year so according to the rules displayed in § III.1.3.1. an example of schedule for the audits could be:

- On year N : factory 1.1 and factory 1.2 (1 day audit each) + workshop 2.1.1 (0.5 day audit)
- On year N+1 : factory 1.1 and factory 2.1 (1 day audit each) + workshop 1.1.3 (0.5 day audit)
- On year N+2 : factory 1.1 (1 day audit) + workshop 1.1.2 (0.5 day audit)
- On year N+3 : factory 1.1 and factory 1.2 (1 day audit each) + workshop 2.1.2 (0.5 day audit)
- On year N+4 : factory 1.1 and factory 2.1 (1 day audit each) + workshop 1.1.1 (0.5 day audit)
- ...

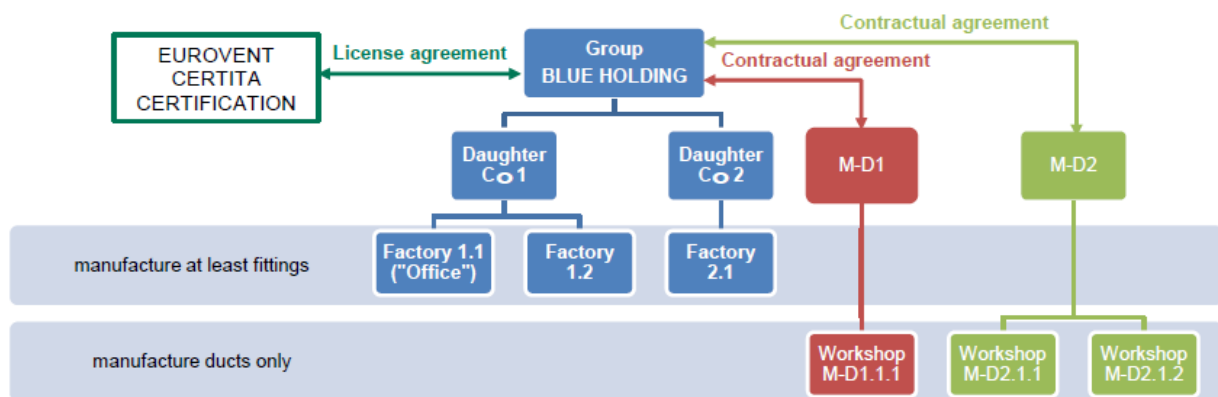
- B.VII.1. Case 3: OEM of fittings only, with at least one complementary manufacturer for ducts signatory of an agreement with his company as specified below**
Case 4: OEM of ducts only, with at least one complementary manufacturer for fittings signatory of an agreement with his company (the case below may also apply to a company that only manufactures ducts).

In the case represented by Figure 4, the Group BLUE HOLDING applies for certification as a manufacturer of fittings only (the same case can apply for a manufacturer of ducts only). As the certification is for ductwork systems, the form DUCT-1 mentions that the Group BLUE HOLDING manufactures fittings but needs to appeal to two complementary manufacturers for which the Group BLUE HOLDING is confident that the ratings he intends to claim will be accurate and with which he signed an agreement: “M-D1” and “M-D2” with respectively one (“M-D1.1.1”) and two duct workshops (“M-D2.1.1” and “M-D2.1.2”).

In the declaration file (DUCT-2) appear all the ductwork elements falling into the scope and sold by the BLUE HOLDING Group under its own brand, that is fittings manufactured in factories 1.1, 1.2 and 2.1 but also ducts manufactured in workshops M-D1.1.1, M-D2.1.1 and “M-D2.1.2”.

In case 3, only the fittings listed in declaration file (DUCT-2) and sold by Group BLUE HOLDING appear on the ECP website. The ECP website clearly specifies that the certified characteristics correspond to the fittings of BLUE HOLDING Group brand only when combined with M-D1 brand or M-D2 brand ducts.

Figure 4: case 3



In case the complementary manufacturers do not participate to the certification programme, the workshops involved in the production of the ducts that will enable to constitute the system have to be audited too and the example of schedule for the audits could become:

- On year N : factory 1.1 and factory 2.1 (1 day audit each) + workshop M-D2.1.1 (0.5 day audit)
- On year N+1 : factory 1.1 and factory 1.2 (1 day audit each) + workshop M-D1.1.1 (0.5 day audit)
- On year N+2 : factory 1.1 (1 day audit) + workshop M-D2.1.2 (0.5 day audit)
- ...

The complementary manufacturers for ducts (M-D1 and M-D2) have no right to claim certification of the ducts since

- this is the whole ductwork system which is certified, not the components
- the certificate mentions explicitly the BLUE HOLDING Group as owner of the certificate

In case the complementary manufacturers participate to the certification programme, only the fittings factories (1.1, 1.2, and 2.1) are to be audited in the frame of BLUE HOLDING Group application for certification. As the factory 1.1 is the “office” it has to be audited each year so according to the rules displayed in § III.1.3.1. an example of schedule for the audits could be:

- On year N : factory 1.1 and factory 2.1 (1 day audit each)
- On year N+1 : factory 1.1 and factory 1.2 (1 day audit each)
- On year N+2 : factory 1.1 (1 day audit)
- ...

APPENDIX C. CAMPAIGN SCHEDULE

TABLE A : CERTIFICATION SCHEDULE FOR THE REPETITION PROCEDURE WHEN THE DUCTWORK SYSTEM IS TO BE TESTED IN THE LABORATORY FACILITY

Certification step	Deadline Q1	Deadline Q2	Deadline Q3	Deadline Q4
EUROVENT CERTITA CERTIFICATION asks for update of declaration file (DUCT-2), sends the test and audit invoices and notifies the audit date	31/10/n-1	31/01/n	30/04/n	31/07/n
The participant sends the up-dated declaration file (DUCT-2)	30/11/n-1	28/02/n	31/05/n	31/08/n
EUROVENT CERTITA CERTIFICATION sends the selected typical ductwork system elements list to the participant.	15/12/n-1	15/03/n	15/06/n	15/09/n
The participant returns to EUROVENT CERTITA CERTIFICATION the completed datasheet (DUCT-3) for the selected typical ductwork system.	31/12/n-1	31/03/n	30/06/n	30/09/n
The auditor audits the participant's facility(ies) and performs the ductwork elements sampling.	31/03/n	30/06/n	30/09/n	31/12/n
The participant sends the ductwork elements to the laboratory.	Audit date + 2 weeks			
The participant sends the audit non-conformity corrective actions plan when applicable	Deadline set up by the auditor			
The auditor evaluates the corrective actions plan relevance	31/05/n	31/08/n	30/11/n	28/02/n+1
All regular tests are completed and test reports sent by the laboratory to EUROVENT CERTITA CERTIFICATION	31/05/n+1	31/08/n	30/11/n	28/02/n+1
EUROVENT CERTITA CERTIFICATION forwards the test report to the participant.	15/06/n	15/09/n	15/12/n	31/03/n+1
EUROVENT CERTITA CERTIFICATION sends the certificate if the requirements specified in § III.2.2. fulfilled.	30/06/n	30/09/n	31/12/n	31/03/n+1
Certificate validity	30/06/n+1	30/09/n+1	31/12/n+1	31/03/n+2
The participant can ask for second test before	15/07/n	15/10/n	15/01/n+1	15/04/n+1
EUROVENT CERTITA CERTIFICATION notifies the sampling audit date and sends the corresponding test and audit invoices	15/08/n	15/11/n	15/02/n+1	15/05/n+1
The participant sends the ductwork elements to the laboratory for second test (when applicable)	Sampling audit date + 2 weeks			
Second tests are completed and test reports sent by the laboratory to EUROVENT CERTITA CERTIFICATION (when applicable).	15/10/n	15/01/n+1	15/04/n+1	15/07/n+1
EUROVENT CERTITA CERTIFICATION forwards the second test report to the participant (when applicable).	31/10/n	31/01/n+1	30/04/n+1	30/07/n+1

TABLE B : CERTIFICATION SCHEDULE FOR THE REPETITION PROCEDURE WHEN THE DUCTWORK SYSTEM IS TO BE TESTED IN THE PRODUCTION FACILITY

Certification step	Deadline Q1	Deadline Q2	Deadline Q3	Deadline Q3
EUROVENT CERTITA CERTIFICATION asks for update of declaration file (DUCT-2), sends the test and audit invoices and notifies the audit/test date	31/10/n-1	31/01/n	30/04/n	31/07/n
The participant sends the up-dated declaration file (DUCT-2)	30/11/n-1	28/02/n	31/05/n	31/08/n
EUROVENT CERTITA CERTIFICATION sends the selected typical ductwork system elements list to the participant.	15/12/n-1	15/03/n	15/06/n	15/09/n
The participant returns to EUROVENT CERTITA CERTIFICATION the completed datasheet (DUCT-3) for the selected typical ductwork system.	31/12/n-1	31/03/n	30/06/n	30/09/n
The auditor audits the participant's facility(ies) with the ductwork elements sampling.	31/03/n	30/06/n	30/09/n	31/12/n
All regular tests are completed.	30/04/n	31/07/n	31/10/n	31/01/n+1
The test reports are sent by the laboratory to EUROVENT CERTITA CERTIFICATION who forwards it to the participant.	Test date + 2-4 weeks			
The participant sends the audit non-conformity corrective actions plan when applicable	Deadline set up by the auditor			
The auditor evaluates the corrective actions plan relevance	31/05/n	31/08/n	30/11/n	28/02/n+1
EUROVENT CERTITA CERTIFICATION sends the certificate if the requirements specified in § III.2.2. fulfilled.	30/06/n	30/09/n	31/12/n	31/03/n+1
Certificate validity	30/06/n+1	30/09/n+1	31/12/n+1	31/03/n+2



Performances on line
www.eurovent-certification.com

EUROVENT CERTITA CERTIFICATION
48-50 Rue de la Victoire, 75009 Paris, FRANCE
Phone: +33 (0)1 7544 7171
www.eurovent-certification.com

