TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK

Heat Recovery Systems with intermediate heat transfer medium

Identification: ECP - 18 HRS-COIL

Revision 1 – September 2021
(This version cancels and replaces any previous versions)

Approbation date: 17/09/2021

Comes into effect from: 01/10/2021

Date of 1st application: 01/10/2021

The purpose of this Technical Certification Rules is to prescribe procedures for the operation of the Eurovent Certified Performance (ECP) certification programme for Heat Recovery Systems with Intermediate Heat Transfer Medium (HRS-COIL), in accordance with the Certification Manual.

Modifications as against last version:

No.	Modifications	Section	Page
1	New structure	all	all
2	New vocabulary	all	all
3	The maximum number of systems selected for testing is reduced from 6 to 4	III.1.3.2.a Selection for admission procedure	10
4	Updated program schedule	Appendix C. Certification Schedule	22

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

Tel: + 33 1 75 44 71 71
E-mail: [h.benhmimou@eurovent-certification.com]

TABLE OF CONTENTS

I. GENERAL INFORMATION

I.1. Scope

I.1.1. General

The programme scope covers the heat recovery exchangers with intermediate heat transfer medium corresponding to the category IIa ("without phase change") of the EN 308:1997 standard, that is Run Around Coils systems.

The present programme does not cover other types of air to air heat exchangers like Air to Air Plate Heat Exchangers (AAHE) or Air to Air Regenerative Heat Exchangers (AARE) for which dedicated Eurovent Certified Performance programmes exist.

I.1.2. Certify-all principle

Whenever a company participates in the programme for HRS-COIL, all Heat recovery Systems that are promoted by the applicant/participant to end-users, specifiers, trading companies, contractors by means of paper or electronic catalogue, price list or selection tool within the scope of the programme, shall be certified, in accordance with this Technical Certification Rules. This includes all models in modular ranges. For the HRS-COIL 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:

- Dry Heat Recovery Efficiency [%].
- Air side pressure drop at standard air density [Pa].
- Fluid (water+25% ethylene-glycol mix) side pressure drop [kPa].

I.3. Definitions

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

Heat recovery system with intermediary heat transfer medium

Heat exchanger or combination of heat exchangers that transfer heat between exhaust and supply air flows by the means of an intermediary heat transfer medium and depending on the differential of temperatures.

Run around coil system

A run around coil system, simply called "system" in the programme, consists of a coil in the extract air and a coil in the supply air; with a pipe system in between to transfer the recovered energy from one air stream to another.

The coil located in the extract-exhaust air stream is called "exhaust coil" and the coil located in the outdoor-supply air stream is called "supply coil" in the HRS-COIL Certification programme.

Range for Run around coils

Coils dedicated to heat recovery and having the following identical features:

- Designation
- tube outside diameter
- tube arrangement:
  - pitch height : tube spacing (i.e perpendicular to the air flow)

- pitch depth : row spacing (i.e in direction of the air flow)
- tube alignment (in-line or staggered)

- minimum and maximum number of rows
- minimum and maximum number of tubes per row
- minimum and maximum finned length

Row

A bank of tubes that are located in a plane at right angle to the direction of the air flow.

Basic Model Group

Within a range, models which are essentially the same or comparable in terms of basic components and/or configurations combinations are gathered into basic model groups (BMG).

The following variations distinguish one BMG from another:

- tube type (plain or inner-grooved)
- tube material category
  - standard : Copper (Cu);
  - special : any other material;
- fin type (flat, corrugated, louvered, wavy)
- fin material for a given fin type
- reference fin spacing (RFS) for a given fin thickness

A reference fin spacing (RFS) is considered representative of a range of fin spacings from 0.7 to 1.3 times its value.

Example: The applicant range covers fin spacings (FS) from 2.0 to 8 mm in the following steps: 2.0, 2.5, 3.0, 4.0, 5.0, 6.0, 7.0 and 8.0 mm. Considering the aforementioned rule there are three (3) reference fin spacings (RFS):

- **2.5** covers the range [1.8; 3.3] so it is considered representative of 2.0, 2.5, 3.0
- **5.0** covers the range [3.5; 6.5] so it is considered representative of 4.0, 5.0, 6.0
- **8.0** covers the range [5.6; 10.4] so it is considered representative of 7.0 and 8.0

Dry heat recovery efficiency

The dry heat recovery efficiency is a temperature ratio defined on the supply-air side for equal air flows and winter conditions (no condensation on the exhaust air side):

$$\eta t = \frac{t22 - t21}{t11 - t21}$$

The temperatures at the coils limits are the following:

t11 : exhaust air inlet (“extract air”) dry temperature (°C)

t12 : exhaust air outlet (“exhaust air”) dry temperature (°C)

t21 : supply air inlet (“outdoor air”) dry temperature (°C)

t22 : supply air outlet (“supply air”) dry temperature (°C)

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, 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 - www.certita.fr

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 laboratory, known as Independent laboratory:

TÜV SÜD Industrie Service GmbH
Ridlerstrasse 65
80339 München
Germany

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):

Test shall be conducted in accordance with EN 308:1997, “Heat Exchangers - Test procedures for establishing performance of air to air and flue gases heat recovery devices”.

II.1.2 Specific requirements and quality management

a. Production requirements

Production identification and traceability:

The participant shall use suitable means to identify the products 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.

Declaration consistency:

The components and materials shall comply with the declared data (TDS/Declaration list).

The products shall be manufactured in production sites declared according article 85.

b. Quality management requirements

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 and all the related 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 customer claims

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

II.2. Marking

It is highly recommended that the participating company indicates participation in the EUROVENT CERTIFIED PERFORMANCE (ECP) programme for Heat Recovery Systems with Intermediate Heat Transfer Medium by the following means.

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

The mark shall include” CERTIFY ALL” and the name of the product “HRS-COIL”.

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 admission: selection tool name and version, the selection tool itself, declaration file and relevant literature.

All characteristics and performances shall be expressed in SI units. Maximum of 3 significant digits shall be used for air flow, capacity, pressure drop.

Submittal of data shall be made by filling in the forms provided by EUROVENT CERTITA CERTIFICATION as .xls or .xlsx files. The forms shall be sent by e-mail to EUROVENT CERTITA CERTIFICATION within the time limits specified in Certification Schedule (*Certification PROCESS AND Schedule*. *Certification PROCESS AND Schedule*).

Copies of the forms are part of this Technical Certification Rules (see Appendix B):

- Declaration file HRS-COIL-1 will be used
  - for manufacturing companies (Original Equipment Manufacturer – OEM) to declare ranges, Basic Model Groups (BMG), performance ratings and technical data.
  - for Brand Name (BN) companies to identify the corresponding model's number of the original equipment manufacturer
- Technical data sheet HRS-COIL-2 will be used to complete technical description of all raw material or incoming goods for the units selected.

To ensure the traceability of the products each certified product shall be marked to ensure traceability with respect to the plant (e.g. serial number) and factory address location.

Information shall be reported in the declaration list too. (Form HRS-COIL-1)

III.1.2 Admissibility of the application

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

Once the application is completed, the admission procedure is articulated as follows:

Every year, Eurovent Certita Certification checks whether the certified products still fulfil the requirements:

- For Brand Name (BN) companies, applicable steps of the selection tool checking procedure and audit procedure shall be conducted (see **Selection tool procedure Selection tool procedure** and Initial admission audit Initial admission audit).
- For Original Equipment Manufacturers (OEM), admission tests in the independent laboratory, selection tool checking procedure and factory audit shall be conducted in compliance with the Certification Schedule.

III.1.3 Implementation of checking operations

The provisions of the Certification Manual apply.

III.1.3.1 Initial admission audit

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

General:

General audit requirements are stated in the Certification Manual.

The audit will consist of the on-site checking of selection tool (see **Selection tool procedure Selection tool procedure**) and the verification that the applicable requirements are fulfilled.

Whenever necessary, Eurovent Certita Certification has the right to ask an auditor to conduct an additional audit to the applicant/participants' factory as well as to collect data directly from customer and perform extra checking of selection tool.

If audits are not conducted within the time limitations specified in the notification received from Eurovent Certita Certification, it is considered as non-application of procedures (see Certification Manual).

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.

a. Audit requirements

During the audit, the auditor will:

- check that the ECP mark is displayed on the production units and on the documentation in compliance with the requirements specified in Certification Manual;
- check the operating selection tool consistency;
- check that the products in the sales record are compliant with the declaration list;
- check that the corrective actions plan is completed or under implementation.

The auditor will also perform a complete review of the quality management system to check that:

- the suppliers are regularly evaluated and that the corresponding evaluations are recorded;
- the raw material or incoming goods conformity with the bill of material (BOM) specifications is regularly evaluated and that the corresponding evaluations are recorded;
- the manufacturing process key steps are submitted to a validation check which results are recorded in particular, performing a coil leakage test is required on each production unit. When the testing method used is not described in standard EN 1779:1999 its relevance shall be proven by the manufacturer;
- the factory personnel is qualified to perform the specific tasks if any;
- every product traceability is ensured;
- calibration of measuring devices is performed on a regular basis;
- production non-conformities are recorded and corrective actions initiated;
- customer complaints are registered and treated (OEM and BN).

b. Audit non-conformity:

After evaluation, a nonconformity is classified critical when the following cases are identified:

- there is a significant risk regarding the product conformity with respect to applicable requirements;
- there is a significant risk regarding the quality management system ability to control the product conformity with respect to applicable requirements;
- a specific non-conformity already pointed out during a previous audit is observed again;

Otherwise the nonconformity is not-critical.

In case of nonconformity, the applicant shall be requested to provide Eurovent Certita Certification with a corrective actions plan within the deadline specified by the auditor (see also III.1.3.1.**Audit failure Audit failure** for the audit failure treatment procedure).

c. Audit failure

The applicant shall resolve the non-conformity within the time limitation agreed in the corrective actions plan.

In case of critical non-conformity, 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 select units to be tested based on its evaluation of the declaration file HRS-COIL-1 communicated by the applicant.

a. Selection for admission procedure:

At least one (1) unit per Basic Model Group (BMG) shall be selected to cover the variations declared.

However, in total the maximum number of systems selected for testing is equal to four (4). If the number of BMG is odd, there will be one extra coil selected to have an even number and the selected coils will be paired into systems in accordance with the following principles:

- The coils characterized by standard tube and fin materials and small fin spacings will be preferably used as supply coils.
- The coils characterized by special tube and fin materials and high fin spacings will be preferably used as exhaust coils.

b. Selection for penalty tests:

Eurovent Certita Certification shall select units for penalty tests from the range which failed. If this range is no longer produced in year N+1 (status “deleted” or “obsolete”) then the selection will be made from the range which is the most similar to the one that failed.

III.1.3.3 Tests at the independent laboratory

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

General

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

- Scheduled tests in admission procedure
- Scheduled tests in surveillance procedure
- Penalty test in surveillance procedure
- Challenge procedure test (See challenge procedure in the certification Manual)

Tests shall be performed at the independent laboratory selected by Eurovent Certita Certification.

The laboratory shall have the responsibility of uncrating, handling, testing and recrating the coils constituting the systems for shipment.

Before testing, the laboratory shall check the product against the information declared in the technical datasheet to ensure that the unit corresponds to the selection.

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

- one of the information is not compliant with the technical datasheet.
- one of the units appears damaged
- Systems shall be assembled and 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. *Upon justified request, the applicant staff may be allowed by Eurovent Certita Certification to attend the preparation and installation of units but not the test itself.*
- No applicant's personnel shall be present in the laboratory test facility during the tests.
- If the test establishes that the system fails to meet one or more of the requirements, the laboratory shall promptly notify Eurovent Certita Certification to receive instructions regarding further actions.

a. Time limitation of acquisition and recovery of units

Deadline for delivery of units to the laboratory, together with the technical data sheet completed and the payment, is defined in the Certification Schedule. For the admission 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 Certification Manual).
Eurovent Certita Certification has discretion not to discontinue the certification when the applicant provides a definite and acceptable date of supply.
The applicant has to recover the products maximum six (6) working weeks after receiving the test reports and results. If the products are not recovered after this delay, the laboratory can destroy them, and the corresponding invoice will be sent by Eurovent Certita Certification to the applicant.

b. Test conditions

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

c. Report of test results and test-check

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

Eurovent Certita Certification shall recalculate the values with the selection tool according to the test operating conditions displayed in the test report ("test-check").

For each test, a performance item fails when the recalculated value and the measurement differ by more than the allowable acceptance criteria (see *FORMS FORMS*).

When one or more performance items fail, the test status is considered FAILED and the failure treatment (See Unit failure Unit failure)corresponding to unit failure shall be applied.

Eurovent Certita Certification will forward to the applicant a copy of the report together with the test report result sheet (HRS-COIL-4).

d. Reasons of failure

The applicant may examine the reasons of the failure.

e. Initial test failure

If the unit is not functional or a component is inoperative or the unit is damaged and cannot be repaired or tested this is considered as a "initial test failure". The laboratory shall immediately inform Eurovent Certita Certification who will notify the applicant. The applicant shall deliver within four (4) working weeks a new copy of the same model, which then shall be tested according to the availability of the laboratory.

If two initial test failures happen successively, the following procedure is applied: the product is removed from the declaration list and from manufacturers catalogue. The applicant shall analyse and provide an explanation of the failures.

If the applicant still wants to have the product certified, the product shall be tested again successfully. A penalty test will be applied for the test campaign N+1.

f. Unit failure

For each failed test, 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 selection tool to the test results. The corrected selection tool with its new version number shall be sent to Eurovent Certita Certification who will check the consistency of the modifications. If the new selection tool is in accordance with all the measurements, the ranges are published on the ECP website with the new rating and certification is granted/. After verification ("test-recheck"), if the selection tool is still not in accordance with the test results, the certification shall not be granted until the selection tool update proves consistency with the tests results.

(2) Ask for a second test on the same unit.

(3) Ask for a second test on a new copy of the same system scheduled by Eurovent Certita Certification according to the availability of the laboratory. This request shall be accompanied by a cause analysis and a relevant corrective actions plan. If this second test is successful, no revision of selection selection tool will be required, otherwise the data will have to be rerated and the selection tool updated.

In both cases (1) and (3), penalty tests will be requested.

III.1.3.4 Selection tool procedure

In addition to the general selection tool requirements which are described in the dedicated appendix of Certification Manual, the selection tool must comply with the following:

- If the technical selection is protected by a username and/or password these shall be provided to the Eurovent Certita Certification representative without any expiry date.
- It is allowed to ask the location of the customer in the selection tool, however all data provided by the selection tool shall be the same whatever the location of the customer is.
- Vocabulary and units shall be in accordance with the present Technical Certification Rules.
- The characteristics available for the system definition and selection shall be consistent with the declared data (available fin materials, thickness and spacing for a given fin configuration, available tube materials…etc.)
- It should be possible to select either the wet bulb temperature or the humidity ratio in addition to the dry bulb temperature to define the air side properties.
- It should be possible to define the volume flow rate as selection tool input on the air side.
- The outputs must be at least displayed under the standard conditions. Standard air density is set at 1.20 kg/m^3. Other values are authorized if accompanied by the underlying air density. The air density shall be clearly stated and present in the printouts.
- It should be possible to select a water+25% ethylene-glycol mix.
- The selection tool performances with water + 0-50% propylene-glycol mix should be lower than performances with water + 0-50% ethylene-glycol mix.

- The selection tool shall give a warning in case the result data run out of acceptable design limits (velocity too high or too low, etc…) defined by the applicant/participant.

Acquisition and initial check of the selection tool:

The selection tool shall be sent together with all required data when the applicant subscribes for the admission procedure.

The selection tool compliance to general requirements (see dedicated chapter in the Certification Manual) and specific requirements is to be checked by Eurovent Certita Certification prior to selection.

Brand Name companies shall also send the operating version of the selection tool to Eurovent Certita Certification to check the consistency with the OEM selection tool version.

In case only in-house programmes are available, a person designated by Eurovent Certita Certification shall undertake himself the selection on site, during a specific visit for BN companies or the factory audit for OEM.

On-site checking of the selection tool:

The auditor appointed by Eurovent Certita Certification shall check the selection tool consistency by selecting two (2) orders at random from the applicant sales records. This check shall be conducted:

- during factory audits for OEM;
- during the facility audit (where the orders to the customers can be accessed) for BN.

Whenever possible, the specific visit for BN shall be scheduled once the OEM has undertaken the testing procedure and/or the OEM on-site checking of selection tool has been performed in order to compare the BN selection tool results to recent OEM selection tool results. Otherwise the selection tool will be checked against the results of campaign N-1.

Whenever possible, one of the checks shall be performed on an order under manufacturing (for OEM) or preparation (for BN) so that the entire composition and technical specifications can be checked on site. For the OEM, the other check shall be performed for a unit similar or identical to one of the production units selected for the test campaign.

The applicant's representative shall fully inform the auditor by submitting all relevant assembly drawings, specifications and technical data sheets of the units under check.

For OEM, in case the products under manufacturing at the audit date do not fall into the certification programme scope, the auditor shall at least check the stock to verify that the raw material or incoming goods under common use in the factory are the same as that appearing in the declaration list.

The composition, technical specifications and performance from recalculation shall be the same as the one specified and announced to the customer. If one of the performance values obtained by the auditor differs by more than the acceptable tolerance, this is considered as a selection tool consistency failure and the applicant shall update his selection tool according to the relevant procedure. If in the meantime the applicant has officially launched a new selection tool version and recalculation is made with this version, deviations should be traceable in the selection tool update record sheet (sheet HRS-COIL-3).

If it appears that different selection tool had been used, this shall be considered as a non-respect of procedures (see Certification Manual).

III.1.4. Penalty tests

In case of established failure, systems for penalty tests have to be selected as follows:

- Two (2) systems in case of failure on heat recovery efficiency.
- One (1) system in case of failure on pressure drop (air side and/or fluid side).

The penalty tests are full tests (all three standard conditions) and shall be performed during the following surveillance test campaign, in addition to scheduled surveillance tests.

III.1.5. Evaluation and Decision

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

- The aforementioned checks prove compliance with the requirements specified in the present Technical Certification Rules.
- All fees have been settled.

If not, the procedure for failure treatment shall be applied.

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:

For the surveillance procedure, the surveillance audit follows the same rules than the admission 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:

Eurovent Certita Certification shall select one (1) coil per range for testing. If the number of ranges is odd, there will be one extra coil selected to have an even number and the selected coils will be paired into systems. However, in total the maximum number of systems selected for testing is equal to three (3). If possible, a configuration different from that previously tested shall be selected, from a different Basic Model Group (BMG) from one year to another for example.

III.2.1.3. Surveillance tests

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

The surveillance tests follow the same rules than the admission tests.

III.2.1.4. selection tool checking procedure

The selection tool checking is done whenever there is a significant change done by the manufacturer.

III.2.2. Evaluation and decision

The provisions of the Certification Manual apply.

For the surveillance procedure, the certification is *renewed* at the date specified in the Certification Schedule (see *Certification PROCESS AND Schedule Certification PROCESS AND Schedule*) 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 delivery together with the technical datasheet and the payment have been completed.

The company receives then a renewed certificate and the display of data is maintained on the 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 organization 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 (HRS-COIL-1) and sending the updated selection selection tool together with the selection tool update record sheet HRS-COIL-3. Non-compliance of the applicant/participant is considered as non-application of procedures. (**See Certification manual**).

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 surveillance one.

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

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

III.4 Suspension/cessation conditions

The provisions of the Certification Manual apply.

APPENDIX A. *TECHNICAL APPENDIXES*

A.1 Purpose

The purpose of this technical Appendix is to establish definitions and specifications for testing and rating of relevant products for the Heat Recovery Systems Programme.

A.2 Testing requirements

Test standard

Test shall be conducted in accordance with EN 308:1997, “Heat Exchangers - Test procedures for establishing performance of air to air and flue gases heat recovery devices”.

Particular specifications for testing:

The following specifications are applicable for admission tests and surveillance tests.

a. Maximum dimensions

The coils constituting the system to be tested shall have the following dimensions:

- Casing length (external) maximum 1 meter
- Casing height (external) maximum 1 meter

For simplicity, the exhaust and supply coils size shall be the same whenever possible.

b. Dimensional check

Before testing, the laboratory shall check dimensions to ensure that the coils delivered correspond to the selected system. The following tolerances are acceptable:

• Finned length	± 0,5 % with at least ± 5 mm
• Finned height of the coil	± 5 mm
• Finned depth (width) of the coil	± 5 mm
• Total number of fins	± 4 %, with at least ± 2 fins
• Diameter of (expanded) tube outside the coil	± 1 mm

If one of the dimensions 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 coil for testing.

c. Heat exchange fluid

The tests shall be performed with water+25% ethylene-glycol mix. It is considered that testing with the water+25% ethylene-glycol mix is representative of run-around-coil systems using a water + 0-50% ethylene-glycol or propylene-glycol mix. To ensure the comparability of test results the CLARIANT product “Antifrogen® N” shall be used.

d. Standard conditions

The certified performances shall be measured for the three (3) standard conditions defined in Table 1.The standard condition 1 (SC1) will be used as design condition to run the selection tool in design mode, with a dry heat recovery efficiency of 68% from as minimum requirement for design, contrary to SC2 and SC3 which will be operating conditions only.

Table 1: Test Standard Conditions (SC)

SC	t_{11}	t_{w11}	t_{21}	q_{v11}	q_{v21}	Heat transfer medium
1	25	<14	5	6000	6000	*Water + 25% ethylene-glycol mix*
2	25	<14	5	3000	3000	
3	25	<14	5	5100	6000	

The abbreviations used in Table 1 are detailed in Table 2.

Table 2: Abbreviations used in Table 1

t	Dry bulb air inlet temperature	°C
t_w	Wet bulb air inlet temperature	°C
q_v	Air volume flow rate	m^3/h
11	Subscript related to exhaust air inlet (“extract air”)	-
21	Subscript related to supply air inlet (“outdoor air”)	-

A.3 Rating requirements

Test-check

Eurovent Certita Certification shall conduct a “test-check”, i.e. the performances will be recalculated at the test operating conditions using the selection tool.

A performance item fails when the difference between the recalculated value recalculated and the test results differs by more than the allowable tolerance (see VII).

A test fails when one or more performance items fail.

Air density

Standard air density is set at 1.20 kg/m^3. It is mandatory to display the certified performances items under the standard conditions in the selection tool outputs. It is allowed to display any other values if accompanied by the underlying air density.

A.4 Certified Performance Items

The following performance characteristics, as defined in EN 308:1997, declared by the applicant/participant shall be verified by tests:

- Dry heat recovery efficiency [%]
- Air side pressure drop at standard air density [Pa]
- Fluid (water+25% ethylene-glycol mix) side pressure drop [kPa]

A.5 Acceptance criteria

When tested in the laboratory the obtained performance data shall not differ from the recalculated values (“test-check”) by more than the following tolerance values:

- -Dry heat recovery efficiency -3 percentage points (abs. deviation)
- -Air side pressure drop at standard conditions for each coil Maxi [+10 % ; +15 Pa]
- -Fluid side pressure drop for each coil Max [+10 % ; +2 kPa]

The relative deviation (in %) between the measured value Xmeas and the recalculated value Xrecal is calculated as follows:

$$\Delta rel = (Xmeas - Xrecal) / Xrecal$$

The absolute deviation between the measured value Xmeas and the recalculated value Xrecal is calculated as follows:

$$\Delta abs = Xmeas - Xrecal$$

If any of individual points of measurement shows a deviation larger than the acceptable tolerance, the failure shall be declared and the failure procedure applied.

APPENDIX B. *FORMS*

FORM HRS-COIL-1: Product Declaration List File

The form **HRS-COIL-1** (declaration file) to be filled in shall be sent by Eurovent Certita Certification to:

- applicants who have signed the license agreement,
- participants on an annual basis before the deadline specified in the Certification schedule.

A template will be available for information and upon request.

The following forms to be filled in shall be sent by Eurovent Certita Certification to applicants/participants who have returned the form **HRS-COIL-1 duly completed,** templates will be available for information and upon request **:**

FORM HRS-COIL-2: Technical Data Sheet

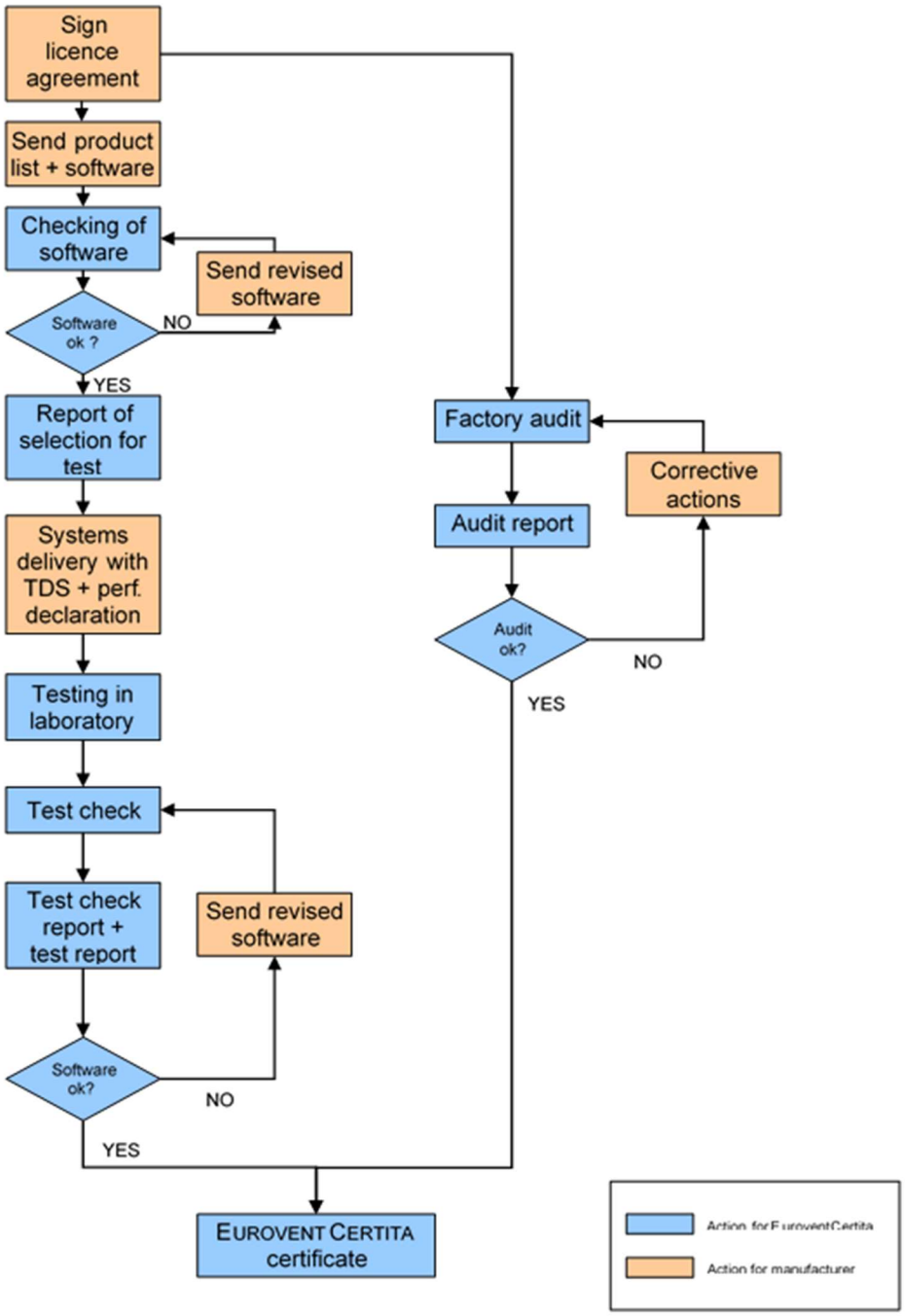
FORM HRS-COIL-3: Selection Tool Update Record Sheet

FORM HRS-COIL-4: Test Report Result Sheet

APPENDIX C. *CERTIFICATION PROCESS AND SCHEDULE*

a. Admission procedure

Figure 1 : Certification process for the admission procedure



b. Surveillance procedure schedule

Table 1: Certification schedule for the repletion procedure

Certification step	Deadline
Eurovent Certita Certification asks for update of declaration list and selection tool from the participant	30/04/n
The participant sends the up-dated products declaration list and selection tool	31/05/n
Eurovent Certita Certification checks the selection tool compliance to requirements. When the selection tool does not meet the certification requirements the manufacturer has to correct it and send a new version. When the selection tool meets the requirements the selection list is sent to the participant for performance declaration (form HRS-COIL-2).	31/07/n
The participant returns the completed performance declaration file and the selection tool printouts for selected systems.	30/09/n
Product delivery + Technical data sheet transmission + payment are completed by the participant	31/10/n
All regular tests, and penalty tests when applicable, are completed and test reports sent by the laboratory to Eurovent Certita Certification	31/01/n+1
The participant sends the audit non-conformity corrective actions plan when applicable	Deadline set up by auditor
Eurovent Certita Certification performs a “test-check” to verify that the selection tool is in accordance with the test results. Eurovent Certita Certification forwards the test reports together with the “test-check” results to the participant.	28/02/n+1
The participant can ask for second tests before	15/03/n+1
The auditor evaluates the corrective actions plan relevance	15/04/n+1
Product delivery + Technical data sheet transmission + payment are completed by the participant for second tests (when applicable).	15/04/n+1
Rerated selection tool is sent to Eurovent Certita Certification (when applicable).	15/04/n+1
Eurovent Certita Certification sends the diploma if all requirements are fulfilled.	30/04/n+1
Diploma validity	30/04/n+2
Second tests are completed and test reports sent by the laboratory to ECC (when applicable).	15/06/n+1
Eurovent Certita Certification verifies the selection tool compliance with the second test results (“test-recheck”) and forwards the second test report together with the “test-recheck” results to the participant (when applicable).	30/06/n+1
Final corrections of the selection tool in case of second failure	15/07/n+1

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