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## TECHNICAL CERTIFICATION RULES



### RADIATORS, CONVECTORS AND CEILING-MOUNTED RADIANT PANELS, HOT WATER, FAN AND MIXED

AFNOR Certification identification no.: NF 047

Revision 17

(This version cancels and replaces any previous versions)

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## NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed

This technical certification reference standard was submitted to AFNOR Certification for acceptance into the NF certification system. It was approved by the legal representative of AFNOR Certification on [29/09/2023](#).

It cancels and replaces any previous versions.

As an accredited certification body<sup>1</sup>, EUROVENT CERTITA CERTIFICATION undertakes to draw up certification technical standards that guarantee an appropriate level of requirements for the quality, fitness for purpose and durability of the products. The accreditation is evidence of the independence and impartiality of EUROVENT CERTITA CERTIFICATION and its technical ability to develop the NF mark.

The technical certification reference standard can be revised, in part or in full, by EUROVENT CERTITA CERTIFICATION after referring to the interested parties. The revision is approved by the legal representative of AFNOR Certification for acceptance into the NF certification system.

This technical certification reference standard must be used jointly with the current version of the **General PROVISIONS for NF programmes managed by EUROVENT CERTITA CERTIFICATION**. Therefore, the requirements of the General provisions for NF programmes managed by ECC should be read because these standards are inseparable from one another.

## HISTORY OF CHANGES

First date of application of the certification reference standard: 03/02/1982.

| Part modified | Revision no. | Date       | Change made   |
|---------------|--------------|------------|---|
| All           | 17           | 29/09/2023 | <ul style="list-style-type: none"> <li>- General:               <ul style="list-style-type: none"> <li>. Change of address for EUROVENT CERTITA CERTIFICATION.</li> <li>. Update of the standards edition.</li> </ul> </li> <li>Miscellaneous corrections.</li> <li>- § 1.3.2 – Transfer of the laboratories' list on the price list NF047 - CETIAT: stop of the test according to the standard EN16430 – IGTE: adding standards EN14037 and EN16430.</li> <li>- § 2.3.6.1.2:               <ul style="list-style-type: none"> <li>. Pressure resistance test: exclusion of multicolumn to reduce the frequency of test.</li> <li>. Cros cut test: frequency of the test.</li> <li>. Corrosion test: adding of synthesis report template.</li> <li>. Wet test: exclusion of the possibility to make a salt spray test.</li> </ul> </li> <li>- § 2.4 - Marking.</li> <li>- § 3.2.1 - Condition of audit dispensation.</li> <li>- § 3.2.1.1 - Remote audit condition.</li> <li>- § 3.2.1.3 - Family product definition.</li> <li>- § 3.2.1.4 – Monitoring test: checking by laboratory before testing.</li> <li>- § A4.5.1 – Incoming goods.</li> </ul> |
| All           | 16           |            | <ul style="list-style-type: none"> <li>- §1.3.2 Addition of the IGTE/HLK laboratory and extension of the field tests for the WSPLab.</li> <li>- §2.3.6.1.3 –Adaption of the tests related to the salt spray test and humidity.</li> <li>- §2.4.2 – Marking on the packaging: withdrawal of the transitional period.</li> <li>- §3.2 – Modality of the surveillance and addition of the remote audit.</li> <li>- §3.2.2 – Addition of complementary tests (under conditions).</li> <li>- §x1.7 – Addition of the maintain application</li> <li>- Miscellaneous corrections.</li> </ul>   |
| All           | 15           | 16/10/2019 | <ul style="list-style-type: none"> <li>- Restructured standard</li> <li>- Added the WSPLab laboratory (EN14037 tests no longer done by CETIAT)</li> <li>- Corrosion test: requirement adapted and transitional period extended</li> <li>- Clarification concerning tests on surface coating of products other than paint</li> <li>- NF marking: mandatory on the packaging</li> <li>- Dimensional measurements</li> <li>- Various corrections</li> </ul>  |

<sup>1</sup> COFRAC accreditation number 5-0517, the scope of the accreditation can be found on [www.cofrac.fr](http://www.cofrac.fr)

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## Partie 1

# GENERAL INFORMATION

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### 1.1 Scope

The products included in the certification programme are those supplied with hot water or steam at temperatures below 120°C:

- Hot water radiators,
- Wall-mounted hot water convectors,
- Radiators or convectors with fans,
- Mixed radiators,
- Ceiling-mounted radiant panels.

The definition of each product can be found in the technical appendices.

### 1.2 Certified characteristics

A “certified characteristic” is any technical characteristic the content of which is checked within the scope of the NF mark.

The certified characteristics of each product can be found in the technical appendices.

### 1.3 Participating organizations

The list of bodies below may be revised or supplemented by the certification organization. The up-to-date list is available on request.

#### 1.3.1 Audit body

The sites to be audited (production entity, points of use, after-sales centres, etc..) are audited by the following audit body:



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The audit may also be conducted by an auditor from another body, provided an audit subcontracting agreement has been signed between EUROVENT CERTITA CERTIFICATION and the other body concerned.

### 1.3.2 Test body/Laboratory

When the inspections involve product tests, these tests are performed, at EUROVENT CERTITA CERTIFICATION's request, by one of the laboratories, which include the mark's laboratories or one of the laboratories recognised under the terms of the "RADMAC" (RADiators Mutual ACceptance) agreement.

Mark's laboratories are listed in the NF047 Mark price list, available from EUROVENT CERTITA CERTIFICATION.

### 1.3.3 Recognition of tests/audits performed by other laboratories/audit bodies

The following monitoring tests/audits may also be taken into consideration:

- those performed under the RADMAC (RADiators Mutual Acceptance) agreement on the mutual recognition of tests and audits,
- those performed under the conditions specified in the technical reference standard in part 3,
- within the scope of use of the applicant/holder's laboratory.

#### 1.3.3.1 HOLDER'S LABORATORY

This part describes the procedure according to which a holder may be authorised to conduct, in its own laboratory, all or part of the tests required as part of *the monitoring* of the mark concerning a product it has manufactured. If only part of the tests is performed, the remaining tests will be performed in a mark laboratory.

When this authorisation is granted, the holder obtains an "NF authorisation" and the laboratory in question is said to be "NF authorised". The NF authorisation of a laboratory applies only to this NF mark, and any mention of this authorisation is prohibited.

##### 1.3.3.1.1 CASE OF A NON-ACCREDITED HOLDER LABORATORY

The conditions for authorising a holder's laboratory and to consider its test results are set forth in the general rules stated in the paragraphs below and possibly in special rules that supplement these general rules, stipulating the application procedures for each category of product subject to a specific standard.

The standard applied is this certification reference standard for the certification procedures and standard EN ISO/IEC 17025 (see date of the applicable standard in §2.1.1) for the test procedures.

#### a) Authorisation request

The application for authorisation is sent to EUROVENT CERTITA CERTIFICATION.

The application must include:

- the types of products for which NF authorisation is requested;
- the standards covered by this application;
- the complete description of equipment and instrumentation at the laboratory's disposal to perform these tests;

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- the description of the laboratory's quality management system (quality manual, quality plan);
- the holder's commitment to comply with the relevant provisions of the application certification reference standard, including its appendices.

**b) Examination of the NF certification application**

EUROVENT CERTITA CERTIFICATION designates a group of auditors tasked with checking the quality assurance measures and the equipment of the laboratory, and the implementation of the test systems.

This group is made up of a laboratory auditor for the "quality management" aspects and at least one representative of an independent laboratory, who acts as the expert for the "tests" aspects.

During the laboratory audit, the auditors:

- a) collect the drawings and diagrams of the premises, installations and equipment, gather information for which the standards or rules governing special procedures require compliance, monitoring or inspection;
- b) check that the laboratory has the necessary and sufficient equipment to perform the tests (the standards or specific procedural rules defining the parts list and the precise specifications for each type of product);
- c) check that the precision of the measuring appliances meets the standards or obeys the rules of the special procedures and that the precautions required to maintain the quality of the measurements are taken;
- d) check that the test equipment is in good working order and is regularly calibrated and rated;
- e) note the name and title of the test official and the branch or department to which he/she belongs within the company;
- f) check that the quality management system is suited to the certification operations and that it is actually applied.

Prior to any NF authorisation, a comparative test is conducted according to the standards applying to the product and/or the additional specifications defined in the appendix to this reference standard, between the holder's laboratory and one of the mark's laboratories chosen by the holder, on the so-called secondary set of three standard radiators belonging to the laboratory applying for authorisation, as specified in standard EN 442-2 (see the date of the applicable standard in §2.1.1).

EUROVENT CERTITA CERTIFICATION compiles a report containing:

- a report of their audit;
- a summary of observations and/or any instances of non-conformity on each point a), b), c), d), e) and f) above;
- a list of material and equipment submitted by the holder for admission testing that meets the specifications of the rules of special procedures or the standards;
- any observations or comments that they deem appropriate.

The mark's laboratory, selected by the holder for the comparative test, compiles a report containing:



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- the result of the comparative test stipulated above. These results must demonstrate that the laboratory meets the requirements specified in the standards applying to the product and/or the additional specifications defined in the appendix to this reference standard, and that the laboratory is capable of contributing to the NF certification procedure;
- any observations or comments that they deem appropriate.

The report is sent to EUROVENT CERTITA CERTIFICATION, which validates it, after having examined the responses of the audited party.

The holder bears the cost of all the aforementioned operations.

**c) NF authorisation agreement**

After verification that the application is complete from the administrative, technical and financial point of view, EUROVENT CERTITA CERTIFICATION approves or rejects NF authorisation specifying the reasons, or delays the decision by recommending an additional study.

The Programme Committee is informed of the authorisations granted by EUROVENT CERTITA CERTIFICATION.

**d) NF authorisation validity period**

The NF authorisation is valid for three years from the date on which the audit is completed. During this period, the laboratory authorises NF to *inspect its secondary set (this laboratory's standard radiator)* in accordance with standard applying to the product and/or the additional product specifications defined in the appendix to this reference standard.

At the end of the tests, the authorised laboratory sends the report to EUROVENT CERTITA CERTIFICATION for analysis of the results.

**e) Renewal of the laboratories' NF authorisation**

NF authorisation is renewed after a new application and complete instruction (see paragraph "a)" above).

**f) Post-NF authorisation checks**

The NF authorised laboratory regularly informs EUROVENT CERTITA CERTIFICATION of the results of the tests conducted on its secondary set of radiators, and of any changes to its quality management system that could impact the results of the tests on the products.

This information, together with the results of the verifications made under this certification reference standard ("systematic" and other verifications) are examined by EUROVENT CERTITA CERTIFICATION which, after evaluation, recommends maintaining, suspending or withdrawing the NF authorisation for all or part of the tests.

**1.3.3.1.2****1.3.3.1.3 CASE OF AN ACCREDITED HOLDER LABORATORY****a) NF authorisation application**

Any holder with a laboratory accredited by COFRAC or any equivalent institution recognised by the E.A (European Cooperation for Accreditation), may request, on the basis of this accreditation, that tests performed in this laboratory and covered by this accreditation for its products, be considered by EUROVENT CERTITA CERTIFICATION.

The NF authorisation application must be sent to EUROVENT CERTITA CERTIFICATION together with the following documents:

- a copy of the accreditation decision stating its scope (type of tests concerned);
- the report(s) drawn up by the accrediting body as part of its accreditation procedure and any subsequent reports of verifications carried out by the accrediting body;
- the commitment to comply with the relevant provisions of the certification reference standard and its appendices.

and indicating for which tests NF authorisation is required, out of those subject to accreditation by COFRAC or an equivalent body recognised by the E.A.

Prior to any NF authorisation, a comparative test is conducted according to the standards applying to the product and/or the additional specifications defined in the appendix to this reference standard, between the holder's laboratory and one of the mark's laboratories chosen by the holder, on the so-called secondary set of three standard radiators belonging to the laboratory applying for authorisation, as specified in standard EN 442-2 (see the date of the applicable standard in §2.1.1).

The test reports are submitted to EUROVENT CERTITA CERTIFICATION for a comparison of the results. In case of discrepancies, the managers of both laboratories must take the appropriate corrective actions under EUROVENT CERTITA CERTIFICATION's supervision.

After examining the test results, EUROVENT CERTITA CERTIFICATION may request further tests if necessary, and possibly after consulting the Programme Committee.

The applicant/holder will bear the costs of the tests performed by the independent laboratory.

EUROVENT CERTITA CERTIFICATION is responsible for monitoring these tests.

The holder bears the cost of all the aforementioned operations.

**b) NF authorisation agreement**

EUROVENT CERTITA CERTIFICATION studies the application and checks that it is complete. If it is not complete, CERTITA asks for more information.

EUROVENT CERTITA CERTIFICATION approves NF authorisation, or rejects it specifying the reasons, or defers the decision, recommending an additional study.

The Programme Committee is informed of the authorisations granted.

**c) NF authorisation validity period**

The NF authorisation NF is valid for three years from the date when the audit is completed. During this period, the NF authorised laboratory proceeds with annual inspections on its secondary set, in accordance with the standards applying to the product and/or the additional specifications defined in the appendix to this reference standard.

**d) Verification and renewal of NF authorisation**

The NF authorised laboratory keeps EUROVENT CERTITA CERTIFICATION regularly informed of the verifications performed by COFRAC or any equivalent institution recognised by the E.A. and of the decisions the latter makes after these verifications as part of its accreditation follow-up.

This information, together with the results of the verifications made under this certification reference standard ("systematic" and other verifications) are examined by EUROVENT CERTITA CERTIFICATION which, after evaluation, recommends maintaining, suspending or withdrawing the NF authorisation for all or part of the tests.

Any total or partial suspension or withdrawal of accreditation must lead to a review of the laboratory's status in respect of the mark. EUROVENT CERTITA CERTIFICATION makes a decision in light of the accrediting body's study and the reasons for refusing accreditation.

It sets out the conditions applying to this possible renewal and specifies the verifications to be carried out.

**TABLE 1: Authorisation procedure for a manufacturer's laboratory with respect to the NF mark (complete or partial tests)**

| HOLDER  | EUROVENT CERTITA CERTIFICATION   | MARK LABORATORY  |
|---|--|--|
| <b>STAGE 1</b>  |  |  |
| . sends EUROVENT CERTITA CERTIFICATION an application and 1 complete file, according to 1.3.3.1.1 or 1.3.3.1.2. The application must also specify the name of the mark's laboratory chosen by the manufacturer to perform the comparison test of <i>STAGE 2</i> . | . records the application and checks that it is complete,<br>. processes the application,<br>. informs the laboratory of the mark that has been selected,<br>. selects the audit team,<br>. issues the corresponding invoice to the holder.  |  |
| <b>STAGE 2</b>  |  |  |
| . conducts the NF conformity tests,<br>. draws up the corresponding test report,<br>. keeps the tested equipment available for the mark's laboratory,<br>. sends to the mark laboratory:<br>. the test report,<br>. the documents relating to the tested product. |  | . conducts the comparative test,<br>. draws up the corresponding test report,<br>. sends the report to EUROVENT CERTITA CERTIFICATION and the manufacturer,<br>. issues the corresponding invoice to the holder. |
| <b>STAGE 3</b>  |  |  |
|   | . examines the whole application (audit result, comparative test results, etc.),<br>. makes a decision based on the results,<br>. notifies its decision to the holder, sending a copy to the laboratory of the mark concerned. The notification specifies the scope of the NF authorisation (complete or partial tests). |  |
| <b>STAGE 4</b>  |  |  |
|   | . examines the renewal procedure according to the provisions of 1.3.3.1.   |  |

TABLE 2: Complete or partial tests procedure performed by an NF authorised laboratory as part of the certification monitoring process

| HOLDER  | EUROVENT CERTITA CERTIFICATION   | MARK LABORATORY  |
|---|--|--|
| <b>STAGE 1</b>  |  |  |
|   | <ul style="list-style-type: none"> <li>. selects the product(s) for the tests,</li> <li>. completes the sampling sheet, specifying the place of the test and the deadline for sending the reports,</li> <li>. sends the sheet to the representative of EUROVENT CERTITA CERTIFICATION and/or to the holder to select the products.</li> </ul>        |  |
| <b>STAGE 2</b>  |  |  |
| <ul style="list-style-type: none"> <li>. tests the product(s),</li> <li>. sends the report(s) to EUROVENT CERTITA CERTIFICATION within 15 days of the tests.</li> </ul> |  |  |
| <b>STAGE 3</b>  |  |  |
|   | <ul style="list-style-type: none"> <li>. examines the test report(s) submitted by the manufacturer,</li> <li>. if necessary, asks the mark laboratory named by the holder during the authorisation process to examine the reports,</li> <li>. if required, makes any necessary changes or additions, with the approval of the laboratory.</li> </ul> | <ul style="list-style-type: none"> <li>. examines the test reports,</li> <li>. sends EUROVENT CERTITA CERTIFICATION the examination's findings.</li> </ul> |
| <b>STAGE 4</b>  |  |  |
|   | <ul style="list-style-type: none"> <li>. notifies the holder of its decision, in accordance with paragraph 3.2.2 "Evaluation of the decision" of the reference standard concerning the general provisions.</li> </ul>  |  |

## 1.4 List of terms

In addition to the provisions specified in the general reference standard, the following definitions apply:

**Production entity** The manufacturing and/or assembly plant of the products submitted for certification, owned by the applicant/holder or used under a subcontracting agreement.

**Range** The range is defined in the standard applying to the product in question.

**Model** The model is defined in the standard applying to the product in question.

## Partie 2

# THE REFERENCE STANDARD'S REQUIREMENTS

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### 2.1 Reference documents

#### 2.1.1 Standards

##### 2.1.1.1 Product and test standards

The standards for each product type or specific tests methods are given in the technical appendices.

The lists of standards in this reference standard include the main applicable standards but are not exhaustive.

- ✓ EN ISO 2409: 2020 – Paints and varnishes - Cross-cut test.
- ✓ EN ISO 9227: 11-2022 – Corrosion tests in artificial atmospheres - salt spray tests.

The test procedure is set out in paragraphs 3.1.3.3 and 3.2.1.3.

- ✓ EN ISO 17872: 2019 – Guidelines for the introduction of scribe marks through coatings on metallic panels for corrosion testing.
- ✓ EN ISO 4628-2: 2016 - - Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: assessment of degree of blistering.
- ✓ EN ISO 4628-3: 2016 - Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: assessment of degree of rusting.
- ✓ EN ISO 4628-8: 2013 - Evaluation of degradation of coatings – Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 8: assessment of degree of delamination and corrosion around a scribe or other artificial defect.

##### 2.1.1.2 Standards concerning the quality management system

- ✓ EN ISO 9001: 2015 -Quality management systems – Requirements.
- ✓ EN ISO/IEC 17025: 2017 - General requirements concerning the competence of calibration and testing laboratories.

#### 2.1.2 Additional technical specifications

The additional specifications for each type of product covered by this reference standard are given in the technical appendices.

### 2.2 Regulations

In addition to the provisions specified in the general reference standard, the following requirements apply.

The applicant/holder is responsible for making sure that the regulations governing its product are effectively respected.

## 2.3 Quality management provisions

In addition to the quality management provisions specified in the general reference standard, the following requirements apply:

The applicant/holder shall have the necessary resources and means for the inspections and tests in order to guarantee products conformity.

Sampling frequency is determined at the applicant/holder's initiative and must be representative of the quantity of products manufactured. If inspection frequencies are specified (hereafter or in the product's technical appendix), they must be taken into consideration in the applicant/holder's inspection plan. However, the latter is free to specify stricter frequencies.

The acceptance criteria for the dimensional inspections of the product shall be shown on the applicant/holder's production drawings and/or the inspection instructions. The acceptance criteria must not be greater than those set out in the standard applying to the product or specified in the technical appendix to this technical reference standard.

The results of the inspections set out in the paragraphs below shall be recorded and retained in accordance with a documented procedure.

The inspection results shall lie within the acceptance criteria specified in the inspection instructions.

The quality system is partly based on the applicant's/holder's implementation of a series of organisational measures to control the compliance of the products delivered with standards and additional specifications where applicable. These provisions are described in the paragraphs below.

These provisions may be completed by specific requirements related to the type of certified product. In which case they are given in the technical appendix to this technical reference standard.

### 2.3.1 Control of products and services provided by third parties

Due observance of the provisions of paragraph 8.4 of [EN ISO standard 9001](#) (date of the applicable standard in §2.1.1) on purchases must systematically be audited.

The applicant/holder shall ensure the quality of the raw materials and components used in the manufacture of products for which it is applying for/holds the right to use the NF mark. The applicant/holder shall:

- Define the specifications of products to be supplied (and possibly establish specifications with its suppliers);
- Define its supplier selection criteria;
- Compile and maintain a regularly updated list of its authorised suppliers;
- Establish and maintain up-to-date records relating to the quality of its acceptable suppliers.

Orders shall clearly describe the product ordered (technical specifications, quantities, lead times, etc.), provide references to the technical characteristics in the specifications and stipulate the request for a certificate of compliance, as required.

In case of subcontracting, a precise specification shall be prepared for the subcontractor.



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The applicant/holder shall establish and carry out inspections of incoming goods by sampling or any other method needed to guarantee that the purchased products used in the production of the products meet the specified purchase requirements.

The procedures relating to these inspections shall be set out in written documentation.

The results of these acceptance inspections shall be recorded and include an indication of the acceptance criteria and decisions taken in cases of non-compliance.

The requirements applying to the acceptance inspections of each product type are included in the technical appendix to this technical reference standard.

**2.3.2 Identification and traceability**

Paragraph 8.5.2 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on identification and traceability must systematically be audited.

Traceability is a requirement of the NF Mark. Accordingly, the provisions specified in EN ISO 9001 (date of the applicable standard in §2.1.1) on unique identification of the product must be taken into consideration.

This identification shall guarantee traceability and ensure that a history of the product can be found.

**2.3.3 Preservation of product**

Paragraph 8.5.4 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on product preservation must be audited.

The applicant/holder shall preserve product conformity during internal operations and during delivery to the intended destination. This preservation must include identification, handling, packaging, storage and protection. Preservation shall also apply to the product components.

The applicant/holder shall use designated areas or storage spaces to prevent damage or deterioration of the product pending its use or delivery.

To detect deterioration, the condition of the product in stock shall be assessed at appropriate and defined intervals.

**2.3.4 Monitoring and measuring resources**

Paragraph 7.1.5 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on the control of monitoring and measuring resources must be audited.

The measurement, inspection and testing equipment likely to have an influence on the tests conducted within the scope of NF Mark certification shall be:

- Calibrated or checked at specified intervals 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 that might invalidate the measurement result;

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- Protected against damage and deterioration during handling, maintenance and storage.

In addition, the applicant/holder shall assess and record the validity of previous measurement results when it is determined that the equipment does not meet the requirements. The applicant/holder shall take appropriate action on the equipment and on any product affected. The records of calibration and verification results shall be conserved.

The inspection, measuring and test equipment shall be used in such a way as to ensure that measurement uncertainty is known and is compatible with the required level of accuracy.

**2.3.5 Customer satisfaction**

Paragraph 9.1.2 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on customer satisfaction must be audited, with the following particularity:

A register of customer complaints must be kept and must state how they are handled. The applicant/holder must keep this register:

- A record of all complaints and recourse concerning products covered by the NF mark.
- A record of action taken.
- A record of the corrective measures adopted when complaint have brought to light a manufacturing defect.

**2.3.6 Release of products and services**

Paragraph 8.6 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on product monitoring and measurement must be audited.

The applicant/holder must monitor and measure the product's characteristics to verify that the requirements for the product are satisfied.

The following checks are conducted:

- By the applicant/holder directly on the production line or in a laboratory installed at the production site,
- By the applicant/holder in an external laboratory, in accordance with arrangements recognised by EUROVENT CERTITA CERTIFICATION,
- By an identified subcontractor.

The product sampling method for these checks shall be precisely described in the quality plan. It shall not be left to the sole discretion of the operator.

For the purposes of the NF mark, the inspection plan must always include at least the tests and inspections referred to below:

**2.3.6.1 Internal production control**

Internal production control shall cover at least the following points:

**2.3.6.1.1 Inspections during production**

The requirements governing the specific inspections of each product type are given in the technical appendix to this technical reference standard.

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**2.3.6.1.2 Leak and pressure resistance tests**

The tests described below apply to all the products covered by this reference standard, apart from mixed radiators. For the latter, the leak test requirements are given in technical appendix 4 of this technical reference standard.

- Leak tests:

The manufacturer must perform a leak test on each individual product by subjecting them to a pressure at least 1.3 times the maximum operating pressure declared by the applicant/holder. The test pressure must not be lower than 5.2 bar. A pressure gauge with a precision of at least  $\pm 5\%$  must be installed on each test bench and be clearly visible to the operator during testing operations.

The test can be carried out with water or pressurized air:

. For the test using water, the pressure in the product must be maintained for 10 seconds after the pressure stabilizes.

. For the test using air, the pressure in the product must be maintained for 3 seconds after the pressure stabilizes.

- Pressure resistance tests:

Once a week and on each production line, the manufacturer must take a product measuring at least 500 mm in length and subject it to a test pressure 1.69 times the maximum operating pressure declared by the applicant/holder. The product is compliant if it does not leak. The test can be carried out using water or air. The pressure in the product must be maintained for 2 minutes (in accordance with the applicable standard) and checked with a pressure gauge having a precision of at least  $\pm 5\%$ .

For radiators of the decorative type or towel warmers made with steel tubes, [with the exception of multicolumn radiators](#), the testing frequency can be gradually reduced as follows:

. Level 1: Once a week per production line. After 6 consecutive successful tests, move on to level 2.

. Level 2: Once every two months per production line. After 3 consecutive successful tests, move on to level 3.

. Level 3: Once every 6 months per production line.

If any test result is non-compliant, level 1 must be immediately applied.

**2.3.6.1.3 Inspecting of the paint or any other surface coating**

The methods used for the preliminary treatment and paint (or any other finish, such as chrome, polishing, etc.) must cover all of the exterior surfaces of a protective coating in contact with the air.

- Monitoring process:

At least once a week, the manufacturer must carry out periodical inspections throughout the painting process (or any other finish), of the surface treatment of the products, until the products are released.

For painted products, the temperature gradient of each polymerization oven must be monitored at least once a year in order to guarantee the curing quality of the final paint.

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**- Inspecting the thickness of the surface coating on the product:**

The manufacturer must check at least the thickness of the final layer of coating for each line once a day. The acceptance criteria must be documented.

For products covered by standard EN 442-1 §4.2 (see date of the applicable standard in §2.1.1), the fire reaction requirement must be met.

**- Cross-cut test:**

On painted products that are ready to be installed, the resistance of the paint to separation must be tested according to standard EN ISO 2409 (see date of the applicable standard in §2.1.1). If the result matches classification 0 or 1, as defined in table 1 of this standard, it is compliant. Inspections must be carried out at least once a day [and for each line](#).

**- Testing corrosion in salt spray:**

These tests are carried out at least once a year on samples taken after the painting process.

For all products falling within the scope of this reference standard, apart from cast iron radiators only coated with primer against superficial corrosion, the salt spray tests described below must be carried out in accordance with EN ISO standard 9227 (see date of the applicable standard in §2.1.1).

These tests must be carried out for each painting line and family product, on a product representative of the production (without convection fins for steel products) on the one hand and on a sample plate on the other hand.

[The results of the salt spray corrosion tests described in the test reports must be included on the template summary report \(see document in § 3.6\). Photos of the samples after the various test cycles may be attached to the report for better understanding and legibility by the auditor and/or EUROVENT CERTIFICATION.](#)

**a) Test on an appliance:**

The appliance is placed in the test chamber without scribe (stripe) on its surface. After 48 (2 cycles), 96 (4 cycles) et 144 hours (6 cycles) period of exposure to salt spray, the condition of the appliance's coating is examined for any signs of corrosion and blisters.

The manufacturer must draw up a clear and detailed summary (in French or English) of the test results after each period of exposure. Any eventual appearance of rust and blisters must be evaluated according to the standards in EN ISO 4628-2 "blisters" (see date of the applicable standard in § 2.1.1) and EN ISO 4628-3 "corrosion" (see date of the applicable standard in § 2.1.1). The results must be recorded.

The manufacturer shall define the acceptance criteria related to the presence of rust and blister, specifying the number, size and location of the appliance to be considered. Its criteria should be documented.

The summary of the test must be made available to the auditor or EUROVENT CERTIFICATION.

**b) Test on a sample:**

The sample shall come from the material used in the manufacture of the products covered by this certification rules. It shall have a minimum dimension of 150 mm x 100 mm.

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Before the test, the surface of the sample is striped in accordance with EN ISO 17872 (see date of the applicable standard in § 2.1.1). The use of the St. Andrew's cross should be preferred.

The corrosion and delamination of the paint are measured after each salt-spray exposure periods of 48 (2 cycles), 96 (4cycles), 120 (5 cycles), 144 (6 cycles), 168 (7cycles), 192 (8 cycles) et 216 hours (9 cycles), and more if the manufacturer so wishes. The standard EN ISO 4628-8 (see date of the standard applicable to § 2.1.1) shall be used to apply the method of measurement and calculation of corrosion and delamination of the paint.

The results of corrosion and delamination of the paint are assessed according to the manufacturer's acceptance criteria.

The manufacturer must draw up a clear and detailed summary of the test results (after each period of exposure) in French or English. This summary has to be given to the auditor or EUROVENT CERTITA CERTIFICATION.

- Humidity test

A test must be carried out, on a representative device for each product family, at least once a year and per line of paint and/or line for another type of surface coating.

A 200-hour test must be carried out according to the method described in standard EN 442-2 (see date of the applicable standard in §2.1.1) or according to a standard having an equivalent testing method.

Conformity is ascertained if the surface of the appliance shows no signs of superficial corrosion after the test.

[A salt spray corrosion test cannot be taken into account to verify the product's compliance with this humidity test requirement.](#)

#### **2.3.6.1.4 Inspection of the NF marking on the products**

The manufacturer must inspect the NF marking as defined in paragraph 2.4 in order to ascertain that it is legible after the painting process and that only certified products are marked. These inspections must be made at least once a day.

#### **2.3.6.1.5 Control of documents**

In order to guarantee that the data is compliant and that the requirements applying to the documentation defined in paragraph 2.4.1 and in the product's technical appendix are met, the applicant/holder must have all the documents (in hardcopy or electronic format) mentioning the certified characteristics checked by competent persons before the said documents are released.

The applicant/holder shall ensure that it controls its applications for the right to use the NF mark, in order to inform EUROVENT CERTITA CERTIFICATION of any modification of elements therein, particularly for any changes made to the products that may affect the certified features (for example: thermal outputs, exponents, maximum operating pressure, etc.).

### **2.3.6.2 Inspections on the finished product**

Through audits on finished products, the manufacturer must carry out periodic sampling inspections (at least once a month) to ascertain product conformity. Inspections must verify:

- compliance of the stacking of the products with a documented instruction,
- storage conditions to guarantee the integrity of the products,
- conformity of the markings with the product,
- conformity of the products with the labelling requirements in the standard applying to the product.

If the maximum working pressure and/or thermal output and/or the characteristic equation are indicated, the conformity of these indications must be checked,

- the presence and legibility of the NF mark,
- the presence of any visible defects in the paint.

### **2.3.7 Control of nonconforming outputs**

Paragraphs 8.7 and 10.2 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on product monitoring and measurement must be audited.

### **2.3.8 Continuous improvement**

The applicant/holder shall carry out actions to eliminate causes of nonconformity to prevent them from recurring.

#### **2.3.8.1 Corrective action**

Paragraph 10.2 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on corrective actions must be audited.

#### **2.3.8.2 Internal audit**

Paragraph 9.2 of EN ISO standard 9001 (date of the applicable standard in §2.1.1) on internal audits must be checked during the monitoring audits.

The body shall carry out internal audits at scheduled intervals to determine whether the quality management system is:

- Compliant with the requirements of the quality management system and this certification reference standard;
- Effectively implemented and maintained.

Records of the internal audits and the results thereof must be kept.

## 2.4 Marking

In addition to the provisions specified in the general reference standard, the following requirements apply:

The marking must be done as [below](#), whenever this is technically possible.

The NF logos are available in electronic format in their French and English versions, through the holder's customer portal (via the website [www.eurovent-certification.com](http://www.eurovent-certification.com)) or from EUROVENT CERTITA CERTIFICATION.

The website address [www.marque-nf.com](http://www.marque-nf.com) can be allowed to consult or obtain the certification rules. It may appear below the logo but if it is not the case must appear in the document bearing the logo.

- For products that only use hot water:



- Radiators or convectors with fans:



- For mixed radiators:



### 2.4.1 Marking of the NF-certified product

Each certified product must show the NF mark permanently, visibly and durably in accordance with the conditions set out in paragraph 2.4.2 of the general reference standard, and in accordance with the specific standards and applicable regulations.

#### - For convectors

The mark is applied both to the heat exchangers and to the housing.

#### - For the other products

##### In steel:

The markings are preferably placed near the collector or the mounting brackets.

##### In cast iron or aluminium:

Markings made in the foundry, preferably near a connection.

#### - Indications to appear on the product

The product is marked in accordance with the marking conditions defined in paragraph 2.4, along with the holder's identification number, which may be followed by the identification number of the production unit, if the NF mark recognises several sites. The holder receives his identification number with the certification of admission to the right to use the NF mark.

#### - Marking difficulties

If this is technically impossible, the mention of the type of product (title under the oval) and the one concerning EUROVENT CERTITA CERTIFICATION (and [www.marque-nf.com](http://www.marque-nf.com)) can be omitted; however, if they appear they must be legible.

The minimum permissible markings are:



(\*) Holder's identification number.



However, due to the specific nature of the NF 047-certified products, the following exceptions to the aforementioned requirements are permitted:

- the requirement for the minimum size of the standard logo defined in the graphic charter is replaced by the notion of legibility.
- moulded or stamped markings will be corrected when a new tool is installed.

When the holder experiences difficulties meeting the above requirements, the planned type of marking is subject to prior approval by EUROVENT CERTITA CERTIFICATION. The request must explain the reasons and the planned marking project.

The following requirements must be met when self-adhesive labels are used:

- They must withstand a minimum temperature of 110° C,
- The adhesive must withstand variations in temperature of the product,
- The NF logo (as defined in paragraph 2.4) must withstand attack by solvents that are regularly used.

The holder's application for exception must be accompanied by the label supplier's specifications, including details of the temperature limits. The holder must provide a commitment to meet the second and third requirements.

#### **2.4.2 Marking on the packaging of the NF certified product or on supporting documentation**

The holder must show the NF marking defined in paragraph 2.4, and at the very least the name of the certified product, on its packaging (e.g.: card, product information label, photo, etc.). Moreover, the holder is strongly advised to place the NF marking on the documents accompanying certified products.

In addition to the NF marking, the certified product's name and trademark must appear on the packaging and/or in documents accompanying the certified products.

#### **2.4.3 Marking on documentation (technical and sales documents, posters, advertisements, websites, etc.)**

The provisions set out in the general reference standard apply.

Displaying the NF mark on the holder's documentation is a means of promoting these products. Therefore, holders of the NF mark are strongly advised to refer to it.

## Partie 3

### CERTIFICATION PROCESS

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#### 3.1 How to obtain certification: the admission procedure

##### 3.1.1 Submission of an admission application file

In addition to the provisions specified in the general reference standard, the following requirements apply:

The application concerns a range of products resulting from a given design and/or production and/or marketing process, defined by a trade mark and/or referring specifically to the product in question and its technical characteristics. If one or more parts are subcontracted, the subcontractors agree to refrain from marketing the products under their own brand and trade name using the NF mark.

The application must be sent to EUROVENT CERTITA CERTIFICATION and presented in accordance with the conditions and templates provided in the paragraph 3.5 below and as an adjunct to §3.1 of the general provision standard.

It specifies the scope of the requested certification (the ranges or models included in the application).

##### 3.1.2 Review of the application

In addition to the provisions specified in the general provision standard, the following requirements apply:

The application is only admissible if

- the products it concerns are mass-produced;
- the applicant is in control of and takes responsibility for the following stages: design, manufacture, assembly, quality control, marking, packaging and release to the market, and specifies the critical points of each stage;
- any stages not carried out by the applicant are covered by a contract defining the respective responsibilities with its service provider. The list of minimum requirements to be included in a contract can be found in the contract sheet, a template for which is given in §3.5. The applicant remains responsible for all of the operations and the consistency thereof;
- the products covered by the application meet the reference standards and technical specifications laid down in Partie 2 of this technical certification reference standard;
- the inspections and tests of the products covered by the application, as specified in the technical documents of this technical certification reference standard, have been in place for at least 3 months;
- all the required documents are enclosed with the application, and in particular the contractual documents between the applicant/agent and the applicant/distributor, where appropriate.

##### 3.1.3 Implementation of monitoring operations

The provisions set out in the general reference standard apply.

### **3.1.3.1 Initial admission audit**

In addition to the provisions specified in the general reference standard, the following requirements apply:

The audit (including preparation, the audit itself, the drafting of the report and the follow-up of corrective measures, if any) takes 2 days. This length of time can be adjusted if the manufacturer does not have a certified quality management system, if several product families are manufactured on the same production site or if an audit is mixed with other certifications on the same production site.

During the audit, the auditor may conduct compliance tests on one of the products submitted for certification or have them conducted in his/her presence, in order to verify the conditions under which inspections are carried out by the applicant.

Verifications my focus on: dimensional checks; pressure tests (deformation, bursting).

### **3.1.3.2 Samples for laboratory tests**

In addition to the provisions specified in the general reference standard, the following requirements apply:

The applicant may directly use one of the NF mark laboratories (named in part 1) or one of the laboratories recognised in the "RADMAC" agreement, to carry out product tests in accordance with the applicable standard, and where applicable, with the additional specification described in the appendix to this technical reference standard.

For a product covered by a European regulation such as the one on construction products (no. 305-2011), the applicant may also contact a notified laboratory. However, if the type of the products is covered by an additional specification described in the appendix to this technical reference standard, the tests for this verification must be carried out in one of the laboratories listed in part 1.

The applicant encloses the test reports and its catalogue (where appropriate) drawn up by the laboratory with its application for the right to use the NF mark. EUROVENT CERTITA CERTIFICATION examines the test reports and ascertains the coherence of the application.

EUROVENT CERTITA CERTIFICATION can carry out additional verifications to ascertain conformity of the product with regard to the application. In that case, EUROVENT CERTITA CERTIFICATION takes one or more sample products chargeable to the holder. These verifications aim to ascertain conformity:

- of the thermal output (within a tolerance of -4% relative to the certified output),
- pressure resistance.

#### Product sampling request

The applicant may also ask for the sample products to be taken by a representative of EUROVENT CERTITA CERTIFICATION with a view to having tests carried out in one of the laboratories listed in part 1 that the applicant has named in its application.

EUROVENT CERTITA CERTIFICATION determines the products, possibly by seeking the advice of one of the NF mark's laboratories. The list of samples is sent to the applicant in readiness for sampling by the representative of EUROVENT CERTITA CERTIFICATION.

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The applicant must ensure that a set of 10 products for each sample is available in the storage areas or on the production line on the day when the samples are taken. Where appropriate, the person in charge of the sampling can ask for a product to be made.

The samples are marked with a distinctive sign by EUROVENT CERTITA CERTIFICATION's representative and sent to the test laboratory by the applicant under the applicant's responsibility. The two parties jointly complete and sign the sampling sheet.

The test reports produced by the laboratory in charge of the tests are sent to EUROVENT CERTITA CERTIFICATION, which then forwards them to the applicant.

**3.1.3.3 Admission tests**

In addition to the provisions specified in the general reference standard, the following requirements apply:

All the examinations and tests of conformity with standards and additional specifications are defined in paragraph 2.1.1.

The examinations and tests are performed under the following conditions:

- option 1: by one of the NF mark's laboratories listed in part 1 or by one of the laboratories recognised under the "RADMAC" agreement (mutual recognition of test results) or by a laboratory notified as specified by the Construction products regulation 305 -2011 for all applications for admission/extension.
- option 2: for electrical safety tests according to standard EN 60335-2-(30 or 43 or 80) (see the date of the applicable standard in §A3.2 and A4.2), by a laboratory accredited in accordance with standard EN ISO/IEC 17025 (see the date of the applicable standard in §2.1.1) by an accreditation body that has signed the recognition agreements as part of the EA (European cooperation for Accreditation).

The examinations and tests of conformity with additional specifications must be carried out by one of the NF mark's laboratories listed in part 1 or possibly by one of the laboratories recognised in the "RADMAC" agreement (mutual recognition of test results).

The products to be tested are defined in the appendix to this technical reference standard, depending on the products covered by the application for certification.

**3.1.4 Evaluation and decision**

The provisions set out in the general provision standard apply.

## 3.2 Maintaining the certification: monitoring and follow-up procedures

### 3.2.1 Implementation of monitoring operations

The provisions set out in the general provision standard apply.

The monitoring procedures depend on:

- The decisions made further to previous inspections,
- The following dispensations (if any):

After obtaining the NF mark, annual inspections are made in the production unit and on the NF certified products. However, EUROVENT CERTITA CERTIFICATION can reduce the frequency of the audits to once every two years, when:

- . The minimal requirements specific to the products defined in part 1 are satisfactory;
- . The manufacturer has demonstrated that its organisation allows to have confidence in its ability to manage and maintain the conformity of its products to the specified requirements;
- . There is no systematic non-conformity with a specified requirement.
- . [It is not possible for a first monitoring audit \(after the initial audit\).](#)
- . The holder does not benefit from the "RADMAC" agreements.

#### 3.2.1.1 Monitoring audit

In addition to the provisions specified in the general provision standard, the following requirements apply:

The audit may be carried out face-to-face or remotely according to the eligibility criteria set out in Annex A "Audit/Remote Sampling" of the common NF rules managed by EUROVENT CERTITA Certification which details the conditions and requirements for conducting remote audits and remote sampling.

[A remote audit is not possible if the holder has benefited from audit dispensation \(see § 3.2.1\) during the previous audit.](#)

In the case of a remote audit, the audit should preferably be carried out before 30 June, but not more than 31 October of the same year.

The audit (including preparation, the audit itself, the drafting of the report and the follow-up of corrective measures, if any) takes one day. This length of time can be adjusted if the manufacturer does not have a certified quality management system, if several product families are manufactured on the same production site or if an audit is mixed with other certifications on the same production site (example: RADMAC agreement).

The audit is conducted by an auditor qualified by EUROVENT CERTITA CERTIFICATION or by an auditor recognised under the "RADMAC" agreement (mutual recognition of audit reports).

During the audit, the auditor may conduct compliance tests on admitted products or have them conducted in his/her presence, in order to verify the conditions under which inspections are carried out by the manufacturer.

Verifications may focus on: dimensional checks; pressure tests (deformation, bursting).

#### 3.2.1.2 Additional admission test and extension

The provisions set out in §3.1.3.3 apply to the applicant, who is now a mark holder.

### 3.2.1.3 *Sampling for tests at the mark laboratory*

In addition to the provisions specified in the general reference standard, the following requirements apply: At least one product per product family admitted to the NF mark is inspected once a year and per manufacturing site.

Product families are considered as following:

Convectors and radiators: steel panels; cast iron; lamellar; multi-column; die-cast aluminium alloy; extruded aluminium; tubulars (skirting, vertical, horizontal); towel warm; mixed.

The samples to be tested are specified by EUROVENT CERTITA CERTIFICATION. Whenever possible, each sample is taken from a batch of at least 10 appliances on the manufacturer's premises or on the open market and marked with a distinctive sign by EUROVENT CERTITA CERTIFICATION's representative. The products are sent by the applicant under its own responsibility to one of the laboratories listed in part 1, unless EUROVENT CERTITA CERTIFICATION decides that they are to be sent to a laboratory of its own choosing.

If necessary, and in particular if the production unit does not undergo a control audit, EUROVENT CERTITA CERTIFICATION can ask the holder to build and ship the samples under its own responsibility by a given date to one of the laboratories listed in part 1, unless EUROVENT CERTITA CERTIFICATION decides that they are to be sent to a laboratory of its own choosing.

### 3.2.1.4 *Monitoring tests*

In addition to the provisions specified in the general reference standard, the following requirements apply:

Before carrying out the tests, the laboratory must ensure that the characteristics of the product allow the tests to be carried out in accordance with the specifications of the applicable standards, and where appropriate, with the additional specifications defined in paragraph 2.1.

The laboratory sends the test reports to EUROVENT CERTITA CERTIFICATION.

EUROVENT CERTITA CERTIFICATION examines the test reports to check the conformity of the results with the certified values, within the permitted tolerances. The acceptance criterion for the thermal output measurement is -4%; the other acceptance criteria are specified in 2.3.6.1 and in the appendix to this technical reference standard for the product in question.

EUROVENT CERTITA CERTIFICATION sends the reports and the conclusions of the evaluation to the holder.

After notification of the results, the holder can ask the laboratory to return its products. However, if the samples are found to be non-compliant, then the holder must first ask EUROVENT CERTITA CERTIFICATION's permission.

If the holder does not ask for its products to be returned within 3 months of issue of the test reports, the laboratory will destroy them.

For holders having a laboratory authorised according to the procedures described in §1.3.3.1 of this technical reference standard, the monitoring tests can be carried out in their laboratory. EUROVENT CERTITA CERTIFICATION will inform the holder of the implementing procedures. The test reports drawn up by the holder shall be sent to EUROVENT CERTITA CERTIFICATION within no more than 15 days of the tests.

### Reinforced monitoring

If the checks produce non-conform results on a product, they are repeated on at least one other identical product, at the holder's expense. As a general rule, the product is tested in the laboratory that carried out the initial tests. Nevertheless, EUROVENT CERTITA CERTIFICATION reserves the right to name another NF mark laboratory.

For holders having an authorised laboratory, the selected product will undergo a comparative test with the laboratory it named during its laboratory authorisation process.

EUROVENT CERTITA CERTIFICATION's representative takes a sample of the product (from a batch of at least 10 appliances) on the manufacturer's premises or on the open market, marking it with a distinctive sign. The representative completes a sampling form and asks the manufacturer to send, under its own responsibility, the sample to the laboratory.

If necessary, and in particular if no products are available in the stock or difficulties are encountered in obtaining a sample of the product, EUROVENT CERTITA CERTIFICATION can ask the holder to build the samples (before a given date) and ship them to the laboratory.

The tests and the evaluation of the results are performed under the conditions specified in the preceding paragraph.

#### **3.2.1.5 Inspection of the technical and sales documentation**

The provisions set out in the general provision standard apply.

#### **3.2.1.6 Verifications at commercial outlets**

In addition to the previous measures, checks can be carried out on samples taken from commercial outlets at EUROVENT CERTITA CERTIFICATION's request. The results are sent to the licensee concerned.

### **3.2.2 Evaluation and decision**

In addition to the provisions specified in the general reference standard, the following requirements apply:

With regard to notification of evaluation of the results of reinforced monitoring, two cases may present themselves:

- the results comply with the certified products: EUROVENT CERTITA CERTIFICATION notifies the holder thereof and the certified characteristics are not corrected.
- the results show another instance of non-conformity with the certified products: EUROVENT CERTITA CERTIFICATION notifies the holder thereof and suspends the range, pending regularization by the holder. The holder proceeds with further tests, as specified in paragraph 3.1. However, if the holder demonstrates that the root cause of the non-conformity is precisely identified (by the expertise of the product) and that he has implemented an effective corrective action, then EUROVENT CERTITA CERTIFICATION may, on the basis of the documents communicated by the holder, decide to carry out a final check on a selected product under the conditions set out in paragraph 3.2.1.4 "additional surveillance".

If an instance of non-conformity sound power or absorbed power is detected (see additional requirements in appendix 4 to this technical reference standard), the difference between the average measured values and the average certified values is deducted from all the certified values.

### **3.3 Statement of changes**

The provisions set out in the general provision standard apply.

#### **3.3.1 Changes concerning the holder**

The provisions set out in the general provision standard apply.

#### **3.3.2 Changes concerning production entities**

The provisions set out in the general provision standard apply.

#### **3.3.3 Changes concerning the quality organisation of production and/or marketing**

The provisions set out in the general provision standard apply.

#### **3.3.4 Changes to the scope of certification: additional admission for a new model and/or new range**

The provisions set out in the general provision standard apply.

#### **3.3.5 Changes concerning the NF-certified product: Extension**

In addition to the provisions specified in the general provision standard, the following requirements apply:

This application concerns a modification of the certified product range (*e.g.: thickness of the sheet metal, dimensions, etc.*), or even added height(s)...

The outputs of the certified range can be preserved for minor changes that do not affect the certified outputs by more than -4%.

The audit can be adapted or mixed with a monitoring audit.

#### **3.3.6 Maintenance application**

The provisions set out in the general provision standard apply.



### 3.3.7 Temporary or permanent cessation of production of an NF-certified product

In addition to the provisions specified in the general provision standard, the following requirements apply:

Any definitive or temporary cessation of production of an NF-certified product range, or any abandonment of the right to use the NF mark, shall be immediately declared in writing to EUROVENT CERTITA CERTIFICATION, specifying the length of time required to deplete the stock of NF-marked products ([in the manufacturer](#)). This period of disposal of the stock may in any case exceed 1 year. Otherwise, the holder must at the end of the period remove NF marking of the products or destroy them.

In the event of a temporary suspension, its lifting is conditional on an audit of the production unit being conducted. The methods for assessing and deciding renewal of the certification are the same as those described for admission in §3.1.

Suspension or withdrawal of the right to use the NF mark is notified by EUROVENT CERTITA CERTIFICATION by e-mail sent to the company.

## 3.4 Conditions for stopping marking or removing the mark in the event of suspension, withdrawal or abandonment

The provisions set out in the general provision standard apply.

## 3.5 Template for an application for certification

### 3.5.1 Documents to be included in an application

The provisions set out in the provision reference standard apply.

The application for the right to use the NF mark shall be sent to EUROVENT CERTITA CERTIFICATION.

- An initial application must be e-mailed to [apply@eurovent-certification.com](mailto:apply@eurovent-certification.com)
- All other applications must be sent to the business manager in charge of the applicant at EUROVENT CERTITA CERTIFICATION.

An application concerning a product that benefits from a foreign conformity mark or a test certificate issued by a foreign laboratory is processed taking into account existing recognition agreements, in accordance with the general rules of the NF mark.

In addition to the general documents specified below, the applicant shall provide additional documents specific to the products defined in their Annex.

**NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed**

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**- Initial application for admission:**

. Form **F-01** “general information” concerning the applicant. This form must be provided when making a first application for the right to use the NF mark or when an adding/modification is made regarding the manufacturing unit.

. Form **F-02** “CONTRACT”. This form must be provided if the applicant subcontracts any of the requirements defined in paragraph 3.1.

**- Additional admission application:**

. Form **F-02** “CONTRACT”. This form must be provided if the applicant subcontracts any of the requirements stated in paragraph 3.1.

**FORM F-01**

NF MARK NF047

**GENERAL INFORMATION SHEET CONCERNING THE APPLICANT/HOLDER****MANUFACTURING ENTITY:**

- Corporate name: .....
- Address: .....
- Country: .....
- Tel.: .....
- SIRET No. (1): ..... APE Code (1): .....
- Fax: ..... /Email, website: .....
- Name and position of the legal representative (2): .....
- Name and position of the contact person (if different): .....
- Certified quality system:             ISO 9001 (attach a copy of the certificate)

**APPLICANT/HOLDER** (if different from the manufacturing entity):

- Corporate name: .....
- Address: .....
- Country: .....
- Tel.: .....
- SIRET No. (1): ..... APE Code (1): .....
- Fax: ..... /Email, website: .....
- Name and position of the legal representative (2): .....
- Name and position of the contact person (if different): .....

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<sup>1</sup>Only for French companies.

<sup>(2)</sup> The legal representative is the person who is legally responsible for the company.

**FORM F-02****NF MARK NF047****CONTRACT FOR THE SUPPLY OF SERVICES**

A document must be provided to specify the contractual relationship between the applicant and the different service provider(s) to whom it subcontracts one or more of the aspects stated in paragraph 3.2 of this reference standard.

The documents must be updated and sent to EUROVENT CERTITA CERTIFICATION whenever the contract(s) is/are amended or the service provider(s) is/are changed.

A contractual document must be drawn up in French and English (if relevant) for each service provider and for each of the aspects stated earlier.

**EXAMPLE OF A CONTRACT****Between the undersigned:**

Company "*Applicant/holder's company name*", located at "*address*" represented by "*Name and title*", duly empowered,

hereafter also the "applicant"/"holder",

Of the one part,

And

Company "*Service provider's company name*", located at "*address*" represented by "*Name and title*", duly empowered,

hereafter also the "service provider",

Of the other part.

**The service(s)**

*To be specified based on the definition of the applicant*

**Minimum requirements to be included in the contract:**

- the service provider must undertake to meet the requirements of the certification rules of the corresponding NF-047 application;
- management of customer complaints by the applicant/holder in conjunction with the service provider;
- management of complaints between service providers by the applicant/holder;
- as part of the design work, the holder of the intellectual property shall be named; it shall inform the other party of any change in the design drawings;
- the service provider shall inform the applicant/holder of any changes to its quality management system, and more particularly of any instances of nonconformity detected during internal inspections or external audits;
- the service provider accepts the possible presence of a representative of the applicant/holder during the admission audits and during monitoring of NF certification;
- the applicant/holder undertakes to inform the service provider of any changes in the certification of the products covered by the NF mark.

Done in .....

On .....

In duplicate, each Party retaining one original.

**For "Applicant/holder's company name" .....** **For "Service provider's company name"**

"Name" ..... "Name"

"title" ..... "title"

*Signature* ..... *Signature*

### 3.6 Summary report of the salt spray test

The summary report in Excel format is available from [EUROVENT CERTITA CERTIFICATION](#).

| Synthesis report of the salt spray test according to the standard ISO 9227 |              |                      |                                   |                          |          |          |          |          |          |
|--|--------------|----------------------|-----------------------------------|--------------------------|----------|----------|----------|----------|----------|
| <b>1- Test on an appliance</b>   |              |                      |                                   |                          |          |          |          |          |          |
| Date of the test report:   |              |                      |                                   | N° of the painting line: |          |          |          |          |          |
| Family product:  |              |                      |                                   | Model tested:            |          |          |          |          |          |
| Standard   | Description  |                      | Exposure duration (1 cycle = 24h) |                          |          |          |          |          |          |
|  |              |                      | 2 cycles                          | 4 cycles                 | 6 cycles |          |          |          |          |
| EN ISO 4628-2  | Blistering   | Acceptation criteria |                                   |                          |          |          |          |          |          |
|  |              | Test result          |                                   |                          |          |          |          |          |          |
|  |              | Conclusion (OK - KO) |                                   |                          |          |          |          |          |          |
| EN ISO 4628-3  | Rusting      | Acceptation criteria |                                   |                          |          |          |          |          |          |
|  |              | Test result          |                                   |                          |          |          |          |          |          |
|  |              | Location             |                                   |                          |          |          |          |          |          |
|  |              | Conclusion (OK - KO) |                                   |                          |          |          |          |          |          |
| Observation :  |              |                      |                                   |                          |          |          |          |          |          |
| <b>2- Test on a sample (minimum dimension 150 mm x 100 mm)</b>             |              |                      |                                   |                          |          |          |          |          |          |
| Date of the test report:   |              |                      |                                   | N° of the painting line: |          |          |          |          |          |
| Standard   | Description  |                      | Exposure duration (1 cycle = 24h) |                          |          |          |          |          |          |
|  |              |                      | 2 cycles                          | 4 cycles                 | 5 cycles | 6 cycles | 7 cycles | 8 cycles | 9 cycles |
| EN ISO 4628-8  | Delamination | Acceptation criteria |                                   |                          |          |          |          |          |          |
|  |              | Test result          |                                   |                          |          |          |          |          |          |
|  |              | Conclusion (OK - KO) |                                   |                          |          |          |          |          |          |
|  | Corrosion    | Acceptation criteria |                                   |                          |          |          |          |          |          |
|  |              | Test result          |                                   |                          |          |          |          |          |          |
|  |              | Conclusion (OK - KO) |                                   |                          |          |          |          |          |          |
| Observation :  |              |                      |                                   |                          |          |          |          |          |          |

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# TECHNICAL APPENDIX 1

## Additional specifications for

# HOT WATER RADIATORS AND CONVECTORS

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### A1.1 SCOPE

This appendix to reference standard NF- 047 specifies the provisions specific to hot water radiators and convectors covered by standard EN 442 (see date of the applicable standard in §9A-2) for their heating function.

This reference standard does not apply any thermal output limits for the certification of products. The output of products that is below or above the limits specified in standard EN 442 (see date of the applicable standard in §A1.2) for the execution of tests is determined by calculation.

**The certified characteristics are:**

- ✓ The thermal output.
- ✓ The maximum operating pressure.

### A1.2 REFERENCE DOCUMENTS

The standards listed below refer to the standards applying to the products but are not exhaustive.

The following standards apply to the products:

**EN 442-1:** December 2014, Radiators and convectors – Part 1: technical specifications and requirements.

**EN 442-2:** December 2014, Radiators and convectors – Part 2: Test methods and rating.

**EN 10204:** January 2005, Metallic products – Types of inspection documents

**EN 10131 :** 2006, [Cold rolled uncoated and zinc or zinc-nickel electrolytically coated low carbon and high yield strength steel flat products for cold forming - Tolerances on dimensions and shape](#)

### A1.3 DEFINITIONS

The definition of the products and ranges is found in standard EN 442 (part 1 and 2) (see date of the applicable standard in §A-1.2).

## A1.4 TECHNICAL SPECIFICATIONS AND CHARACTERIZATION METHODS

### A1.4.1 Determination of the output of the appliances

The number of products is selected and the output determined according to the test methods defined in standard EN 442-2 (see date of the applicable standard in §A-1.2).

The thermal output of panel radiators is determined with the appliances fitted at least with their grill and side plates, if this version is contained in the applicant's / holder's catalogue.

If he so wishes, the applicant/holder can ask the laboratory to test more appliances than the number specified in standard EN 442-2 (see date of the applicable standard in §A-1.2).

For horizontal water flow radiators, for which the proportionality versus the length is not necessarily verified, the applicant/holder can ask for several lengths of the selected model to be tested.

If, in certain special cases, the selection method for the appliances as described in standard EN 442 (see date of the applicable standard in §A-1.2) or in the test procedure cannot define them, then EUROVENT CERTITA CERTIFICATION is free to choose the models, possibly in conjunction with one of the mark's laboratories.

### A1.4.2 Mechanical resistance and deformation of the appliances

Panel radiators, plate radiators and flat tube radiators must be tested at a pressure 1.3 times the maximum operating pressure declared by the applicant/holder in its application for the right to use the NF mark, in order to measure their permanent deformation. The test pressure cannot be less than 5.2 bar.

The conformity of the products is confirmed if the ratio between the initial and final measurements (after pressurisation) is lower than 10%.

Selecting the products for the initial tests (application for the right to use the NF mark):

The appliances to be tested are those used to determine the thermal output.

Selecting the products for the follow-up tests:

The appliance must be at least 500 mm long, and it is preferable to select a product that is close to 1 metre in length.

### Test method

The measurements are taken as follows:

#### 1- Initial measurement:

The measurement must be taken with an instrument that can measure the thickness on a point of contact (such as a calliper with pointed nose (or hook), a micrometre, etc.)

The thickness is measured at six points on the product as follows:

. For panel radiators:

On multi-panel radiators, the measurement is made on a single panel.

The measurements are made half-way up the collectors **of the radiator**: three at the top **of the radiator** and three at the base **of the radiator**.



**NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed**

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For each collector, the first two measurements are made one third of the way along the length of the radiator at each extremity and third is made half-way along the length. If obstacles, such as convection fins or reinforcing spacers, prevent the measurements from being made, then the point of measurement can be moved slightly to the left or the right.

. For flat tube radiators:

Measurements on radiators with multiple rows of tubes are made on a single row.

The measurements are made in the middle of the width of the tube. It is best to measure 3 points on the tube at one end of the radiator and 3 points on the tube at the other end of the radiator.

For each tube, the first two measurements are made one third of the way along the length of the tube of the radiator at each extremity and third is made half-way along the length. If obstacles such as convection fins or reinforcing spacers prevent the measurements from being taken, the point of measurement can be moved slightly to the left or the right.

. For lamellar radiators:

The measurement is made on one side of the radiator.

The measurements are made in the middle of the depth of the plate of the radiator at each extremity: three on one side, and three on the other side.

For each plate, the first two measurements are made one third of the way up the height of the radiator at each extremity and third is made half-way up the height.

## 2 - Applying the test pressure using the selected process:

### - Water test:

The test is performed using a test pump or a suitable hydraulic test circuit. The pressure gauge must have a precision of at least  $\pm 5\%$ .

After having filled and drained the radiator, gradually and smoothly apply and maintain the test pressure for 10 minutes.

### - Air test:

The test apparatus comprises:

- a tank filled with water and its accessories.
- a pneumatic circuit capable of delivering the required pressure.

Gradually and smoothly apply the air pressure to the radiator submerged in water for 2 minutes.

## 3- Final measurement:

After relieving the pressure inside the appliance, repeat the measurements at the same points as the initial measurements.

## A1.5 QUALITY CONTROL SPECIFICATIONS

The quality control provisions stated in part 2 of this reference standard apply to these products. The manufacturer shall also apply the following specific requirements:

Paragraph A-5.1 - Steel panel and lamellar radiators

Paragraph A-5.2 - Steel tube radiators

Paragraph A-5.3 - Aluminium alloy radiators

Paragraph A-5.4 - Extruded aluminium radiators

Paragraph A-5.5 - Cast iron radiators

Paragraph A-5.6 - Convectors

### A1.5.1 - STEEL PANEL AND LAMELLAR RADIATORS

#### A1.5.1.1 *Inspection of the components and raw materials*

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention shall be paid to the following parts:

For lamellar radiators:

. the connections

For panel radiators:

. the connections

. the reinforcing rings

. the integrated valves and fittings

. the grill

. The manufacturer must check the thickness and surface condition of steel coils (no rust or scaling). The steel sheet used must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in §A1.2). It is advisable to ask for an analysis certificate for each delivery (in accordance with standard EN 10204 paragraph 2.2 (see date of the applicable standard in §A1.2)), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

### **A1.5.1.2 Dimensional inspections during production**

The manufacturer must carry out at least the following inspections, in accordance with its own sampling plan.

Inspections shall be carried out on each production line, at each modification of the manufacturing programme (i.e., at the changing of height or product type) or at least once a day.

The radiators are selected from the end of the production line before the painting; the dimensional check of the convection fins can be done before.

#### List of inspections and acceptance criteria (in mm):

##### For panel radiators

- . Inspection of the connection centre-to-centre distance - *tolerance*  $\pm 2$
- . Inspection of the overall depth - *tolerance*  $\pm 2.5$
- . Inspection of the height:
  - of a single panel – *tolerance*:  $H \leq 900 \text{ mm}, \pm 2$ ;  $900 \text{ mm} < H, +3/-2$
  - of the finished radiator (several panels) – *maximum offset*  $+2 \text{ mm}$  (on all the panels)
- . Inspection of the length:
  - of a single panel – *tolerance*:  $L \leq 1,000 \text{ mm}, \pm 2$ ;  $1,000 \text{ mm} < L, \pm 0.25\%$
  - of the finished radiator (several panels) – *maximum offset*  $+2 \text{ mm}$  (on all the panels)
- . Inspection of the depth of the fins - *tolerance*  $\pm 1$
- . Inspection of the height of the fins - *tolerance*  $+3/-1$
- . Inspection of the depth of the water channels or the collector - *tolerance*  $\pm 1$

##### For lamellar radiators:

- . Inspection of the connection centre-to-centre distance - *tolerance*  $\pm 2$
- . Inspection of the overall depth - *tolerance*  $\pm 2.5 \text{ mm}$
- . Inspection of the overall height - *tolerance*:  $H \leq 900 \text{ mm}, +4/-2$ ;  $900 \text{ mm} < H, +5/-2$
- . Inspection of the overall length - *tolerance*:  $L \leq 1,000 \text{ mm}, \pm 3$ ;  $1,000 \text{ mm} < L, \pm 0.5\%$

### **A1.5.1.3 Mechanical resistance tests and deformation measurements**

Mechanical strength tests at pressure must be carried out in accordance with paragraph A1.4.2. Samples must be taken at least once a month. The selected samples must be representative of the production output.

#### **A1.5.1.4 Weld inspections**

The manufacturer must check the quality of the welds on the radiator by performing either destructive or non-destructive tests, defined according to a suitable and reproducible method. A test with a hammer cannot be considered reproducible: the manufacturer must carry out the inspection by measuring a force with a suitable instrument such as a torque wrench for instance. The checks should be carried out at least once a day on the following components:

##### For panel radiators

- . on the connections
- . on the fitting supports (if any)
- . on the spacers
- . on the fins

The criteria for evaluating the compliance of the results are left to the discretion of the manufacturer. However, the manufacturer must be able, with a documented study, to demonstrate to the auditor the way in which he determined them.

#### **A1.5.1.5 Build inspection for panel radiators with covers on front plate**

If the manufacturer produces radiators with covers on the front plate, he shall draw instructions describing the attachment process, which he commands perfectly.

### **A1.5.2 TUBULAR RADIATORS**

#### **A1.5.2.1 Inspection of the components and raw materials**

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention must be paid to the following parts:

- . connections and covers,
- . grilles (if relevant).

. For steel tubes/sections, the manufacturer must inspect the thickness, diameter, height, width and surface condition. The tubes/sections used must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in §A1.2). It is advisable to ask for an analysis certificate for each delivery (in accordance with standard EN 10204 paragraph 2.2 (see date of the applicable standard in §A1.2)), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. The manufacturer must check the thickness and surface condition of steel coils. It is advisable to ask for an analysis certificate for every supply (in accordance with standard EN 10204 paragraph 2.2), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

## NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

### A1.5.2.2 Dimensional inspections during production

Inspections shall be carried out on each production line, at each modification of the manufacturing programme or at least once a day.

The frequency may be brought to once a week, if and only if the manufacturer demonstrates his ability to control and maintain the technical conformity of his products, by the implementation of relevant checks at different stages of production, in order to guarantee the final dimensions of its products; each of its checks must be done at least once a day.

The radiators are selected from the end of the production line before the painting; the dimensional check of the convection fins can be done before.

#### List of inspections and acceptance criteria (in mm):

##### For tubular radiators (decorative and towel warmer)

- . Inspection of the connection centre-to-centre distance - *tolerance*  $\pm 2$
- . Inspection of the overall depth - *tolerance*  $\pm 1.5$
- . Inspection of the overall height - *tolerance*:  $H \leq 900 \text{ mm}$ ,  $+4/-2$ ;  $900 \text{ mm} < H$ ,  $+5/-2$
- . Inspection of the overall length - *tolerance*:  $L \leq 1,000 \text{ mm}$ ,  $\pm 4$ ;  $1,000 \text{ mm} < L$ ,  $\pm 0.4\%$
- . Inspection of the depth of the fins - *tolerance*  $\pm 1$
- . Inspection of the height of the fins (*if relevant*) - *tolerance*  $+3/-1$
- . Inspection of the radiator's bending on its depth (*if relevant*) – *tolerance*:  $P \leq 1\,000 \text{ mm}$ ,  $\pm 5$ ;  $1\,000 \text{ mm} < P$ ,  $\pm 0.5\%$

##### For multiple-column radiators

- . Inspection of the connection centre-to-centre distance - *tolerance*  $\pm 2$
- . Inspection of the overall depth - *tolerance*  $\pm 1.5$
- . Inspection of the overall height - *tolerance*:  $H \leq 900 \text{ mm}$ ,  $+4/-2$ ;  $900 \text{ mm} < H$ ,  $+5/-2$
- . Inspection of the length of the element and/or overall length
  - *Tolerance at the element according to the manufacturer's specification*
  - *Overall tolerance*  $L \leq 1,000 \text{ mm}$ ,  $\pm 4$ ;  $1,000 \text{ mm} < L$ ,  $\pm 0.4\%$
- . Inspection of the alignment of the battery on both 2 axes (**Cartesian coordinates: x (front view), z (top view)**) – *tolerance*  $+4/1,000 \text{ mm}$

### **A1.5.2.3 Mechanical resistance tests and deformation measurements**

Mechanical strength tests at pressure must be carried out on radiators made with flat tubes in accordance with paragraph A1.4.2. Tests must be carried out at least once a month. The selected samples must be representative of the production output.

The manufacturer can carry out tests on the finished unpainted product or on tubes taken from stock. In the latter case, the manufacturer must randomly select two tubes in the stock and cut them to a length of two metres. The tubes are welded at their ends and fitted with a connector to allow pressurization thereof. Three measuring points must be made in the middle of the width of the tube, on each tube: one point in the middle of the length of the sample and the two others at 600 mm from each end. The measurements and the conformity assessment must comply with the method described in paragraph A1.4.2.

### **A1.5.2.4 Weld inspections**

The manufacturer must check the quality of the welds by performing either destructive or non-destructive tests, defined according to a suitable and reproducible method. A test with a hammer cannot be considered reproducible: the manufacturer must carry out the inspection by measuring a force with a suitable instrument such as a torque wrench for instance. The checks should be carried out at least once a day on the following components:

- . on the connections (if electric welds),
- . on the fitting supports (if any and if electric welds),
- . on the fins.

The criteria for evaluating the compliance of the results are left to the discretion of the manufacturer. The manufacturer must be able, with a documented study, to demonstrate to the auditor the way in which he determined them.

### **A1.5.2.5 Build inspection for radiators with covers**

If the manufacturer produces radiators with covers on the front plate, he shall draw instructions describing the attachment process, which he commands perfectly.

### **A1.5.3 ALUMINIUM ALLOY RADIATORS**

#### ***A1.5.3.1 Inspection of the components and raw materials***

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention must be paid to the following parts:

- . the joints
- . the nipples

. For aluminium alloy, the manufacturer must carry out a spectrometric test on each batch. The aluminium must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in §A1.4.2). It is advisable to ask for an analysis certificate for each supply, specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. If steel tubes are used, the manufacturer must check their thickness. It is advisable to ask for an analysis certificate for each delivery (in accordance with standard EN 10204 paragraph 2.2 (see date of the applicable standard in §A1.4.2)), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must be able to demand this information from the supplier.

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

#### ***A1.5.3.2 Inspections during production***

The manufacturer must carry out at least the following controls according to the established sampling plan.

Inspections shall be carried out on each production line, at each modification of the manufacturing programme or at least once a day.

#### **List of inspections and acceptance criteria (in mm):**

. Inspection of the aluminium alloy in the smelting furnace – *tolerance according to the standard's specification*

. Inspection of the flatness of the bearings or the alignment of the battery

*Tolerance:*

. *on the bearing, according to the manufacturer's specification*

. *on the squaring, +4/10 elements*

. Inspection of the threads of the connections

. Inspection of the tightening torque of the nipples – *tolerance according to the manufacturer's specification*

- . Inspection of the centre-to-centre of the connections (after threading the part) – *tolerance +0.8/-1.2*
- . Inspection of the overall depth of the part (\*) - *tolerance +0/-1*
- . Inspection of the overall height - *tolerance ±2.5*
- . Inspection of the overall length of the part (\*) - *tolerance ±0.2*
- . Inspection of the height of the convection surfaces (\*) - *tolerance +0.2/-0.8*
- . Inspection of the depth of the convection surfaces (\*) - *tolerance +0.2/-0.8*

(\*) These inspections can be made when checking the moulds (validation/maintenance)

#### **A1.5.3.3 Validation and maintenance of the moulds**

The manufacturer must write and implement approval and maintenance procedures for the moulds.

When validating the moulds, all the dimensions of the part must be measured in accordance with the drawing and the results of the inspections must be recorded in a report.

For maintenance, each operation must be recorded in the mould's file. Any significant changes must be validated (see above).

#### **A1.5.3.4 Destructive inspections**

The manufacturer must make sure that the minimum thickness of the wet wall is no less than the thickness defined in standard EN 442-1 (see date of the applicable standard in §A1.4.2) by taking daily random production samples.



## **A1.5.4 EXTRUDED ALUMINIUM RADIATORS**

### ***A1.5.4.1 Inspection of the components and raw materials***

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention must be paid to the following parts:

- . the joints
- . the nipples

. The manufacturer must check the diameter and thickness of the water channel. The sections must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in §A1.4.2).

. If aluminium ingots are used, the manufacturer must carry out a spectrometric test on each batch. The aluminium used must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in §A1.4.2).

. If the heads are purchased, the manufacturer must check the diameter of the nipples.

For each delivery of aluminium ingots, heads and sections, it is advisable to ask for an analysis certificate, specifying in particular the chemical composition of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

### ***A1.5.4.2 Inspections during production***

The manufacturer must carry out at least the following controls according to the established sampling plan.

Inspections shall be carried out on each production line, at each modification of the manufacturing programme or at least once a day.

#### **List of inspections and acceptance criteria (in mm):**

- . Inspection of the aluminium alloy in the smelting furnace (where appropriate)

*Tolerance according to the standard's specification*

- . Inspection of the flatness of the bearings or the alignment of the battery

*Tolerance:*

*. on the bearing, according to the manufacturer's specification*

*. on the squaring, +4/10 elements*

. Inspection of the threads of the connections – *tolerance according to the manufacturer's specification*

. Inspection of the tightening torque of the nipples – *tolerance according to the manufacturer's specification*

- . Inspection of the connection centre-to-centre distance - *tolerance* +0/-1.2
- . Inspection of the overall depth (\*) - *tolerance*  $\pm 0.65$
- . Inspection of the overall height - *tolerance*  $\pm 2.5$
- . Inspection of the overall length of the part - *tolerance*  $\pm 0.65$
- . Inspection of the height of the convection surfaces (\*) - *tolerance* +0.2/-0
- . Inspection of the depth of the convection surfaces (\*) - *tolerance* +0.2/-0

(\*) These inspections can be made when checking the moulds or stamps (validation/maintenance)

#### **A1.5.4.3 Validation and maintenance of the moulds**

. If the manufacturer makes aluminium alloy heads, he must write and implement mould approval and maintenance procedures.

When validating the moulds, all the dimensions of the part must be measured in accordance with the drawing and the results of the inspections must be recorded in a report.

For maintenance, each operation must be recorded in the mould's file. Any significant changes must be validated (see above).

. If the manufacturer outsources the production of the heads, he must take the necessary steps to monitor and control the supplier(s). The moulds must be validated under the same conditions as above.

## **A1.5.5 CAST IRON RADIATORS**

### ***A1.5.5.1 Inspection of the components and raw materials***

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention must be paid to the following parts:

- . the joints
- . the nipples
- for the smelting:
  - . the ferro-silicon
  - . the ferro-manganese
  - . the phosphorous
- for the moulding:
  - . the black mineral
  - . the bentonite
- for the coring:
  - . the resin

. The manufacturer must carry out regular inspections of the components listed below. It is advisable to ask for an analysis certificate for each supply, specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

#### **List of components:**

- . new cast iron (the grey foundry iron must comply with the specification concerning material specified in §4.2 of standard EN 442-1) (see date of the applicable standard in A1.4.2)
- . the moulding silica sand (granulometry checks)
- . the coring silica sand (granulometry checks)

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

### ***A1.5.5.2 Inspections during production***

The manufacturer must carry out at least the following controls according to the established sampling plan.

Inspections shall be carried out on each production line, at each modification of the manufacturing programme or at least once a day.

List of inspections and acceptance criteria (in mm):For the moulding sand:

- . compressibility check
- . shear check
- . humidity check
- . permeability check

For the coring:

- . dimensional check of the bearings – *tolerance according to the manufacturer's specification*
- . check for air ducts

- For the smelting:

- . dimensional check of the furnaces – *tolerance according to the manufacturer's specification*
- . spectrometric analysis of the cast iron

For machining and assembly:

- . inspection of the threads of the connections
- . inspection of the position of the connections with the part, horizontally and vertically
  - . *tolerance according to the manufacturer's specification*
- . inspection of the equidistance of the blade bearings – *tolerance according to the manufacturer's specification*
- . inspection of the flatness of the bearings – *tolerance according to the manufacturer's specification*
- . inspection of the tightening torque – *tolerance according to the manufacturer's specification*
- . inspection of the length – *tolerance  $\pm 1.5\%$  mm*
- . inspection of the centre-to-centre of the connection (after threading the part) - *tolerance  $\pm 0.5$  mm*

Other inspections:

- . inspection of the height (\*) – *tolerance  $\pm 4$  mm*
- . inspection of the depth (\*) – *tolerance  $\pm 2$  mm*
- . inspection of the height of the convection surfaces (\*) - *tolerance  $+3/-1.5$  mm*
- . inspection of the depth of the convection surfaces (\*) - *tolerance  $\pm 1.5$  mm*

(\*) These inspections can be made when checking the models (validation/maintenance)

**A1.5.5.3 Validation and maintenance of the core boxes and model plates**

The manufacturer must write and implement procedures for validation and maintenance.

When validating, all the dimensions of the part must be measured in accordance with the drawing and the results of the inspections must be recorded in a report.

For maintenance, each operation must be recorded in a file. Any significant changes must be validated (see above).

**A1.5.5.4 Destructive inspections**

The manufacturer must make sure that the minimum thickness of the wet wall is no less than the thickness defined in standard EN 442-1 (see date of the applicable standard in §A1.4.2) by taking daily random production samples.

## **A1.5.6 CONVECTORS**

### ***A1.5.6.1 Inspection of the components and raw materials***

. For connections, the manufacturer must proceed with inspections or other activities needed to ensure that the product is compliant.

. The manufacturer shall check the thickness and surface condition of steel, aluminium or other coils. It is advisable to ask for an analysis certificate for each delivery (in accordance with standard EN 10204 paragraph 2.2 (see date of the applicable standard in §A1.4.2)), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. The manufacturer shall check the thickness and surface condition of tubes. It is advisable to ask for an analysis certificate for each delivery (in accordance with standard EN 10204 paragraph 2.2 (see date of the applicable standard in §A1.4.2)), specifying in particular the chemical composition and the mechanical characteristics of the product. Otherwise, the manufacturer must receive this information from the supplier on request.

. The coils (steel, aluminium or other) and tubes must comply with the specifications concerning the material and the thickness of the walls of wet surfaces defined in §4.2 of standard EN 442-1 (see date of the applicable standard in A1.4.2).

. For the paintwork, it is advisable to ask for an analysis certificate for each delivery, specifying the characteristics of the batch. Otherwise, the manufacturer must receive this information from the supplier on request.

### ***A1.5.6.2 Inspections during production***

The manufacturer must perform at least the following inspections, in accordance with its own sampling plan.

Inspections shall be made whenever changes are made to the manufacturer program or at least once a day.

#### **List of inspections and acceptance criteria (in mm):**

- . Dimensional inspection of the fins:
  - ✓ Height – *tolerance*  $\pm 0.5$
  - ✓ Depth – *tolerance*  $\pm 0.5$
- . Check of all the dimensions of the casing
  - ✓ Height – *tolerance*:  $H \leq 900 \text{ mm}, +4/-2; 900 \text{ mm} < H, +5/-2$
  - ✓ Length – *tolerance*:  $H \leq 900 \text{ mm}, \pm 5; 900 \text{ mm} < H, \pm 0.5\%$
  - ✓ depth – *tolerance*  $+4/-3$

## A1.6 SPECIFIC TEST METHODS

There are no specific test methods. The methods described in standard EN 442-2 (see date of the applicable standard in A1.4.2) apply.

## A1.7 CERTIFICATION DOCUMENTS

In addition to the general documents specified in §3.5, the applicant shall also supply the documents listed below:

- Admission application (initial or complementary) or application for a modification on certified range:
  - ✓ The product declaration list (Excel workbook to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ The manufacturing drawing(s), in accordance with the instructions in form FA-01
  - ✓ The test reports and/or catalogue from a laboratory that:
    - . possesses the NF mark,
    - . is part of the RADMAC agreements,
    - . is notified within the meaning of Construction Products Regulation 305-2011.
  - ✓ Declaration of conformity form FA-02
- Maintain application:
  - ✓ The product declaration list (Excel file to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ Maintain letter of the right to use NF mark

## FA-01

**INSTRUCTIONS FOR THE SUPPLY OF DRAWINGS****\* For all types of radiators/convectors:**

- One drawing per range or model, containing:
  - ♦ the different detailed views and cross-sections required to define the appliance. These shall show the dimensions with their tolerances with the various thicknesses having an impact on the thermal heat output and on pressure resistance of the appliance,
  - ♦ all dimensions with tolerances, that impact the emission of heat (without forgetting the overall length and depths, the length and depth of the emitter, the height and the centre-to-centre distance). The tolerances have at least to follow those defined for each product in §A1.5.
  - ♦ the main dimensions of other models (height) with their tolerances, presented in a table,
  - ♦ the number, scale, name of the company and date,

**\* For panel radiators:**

- ♦ a view of the fin panel, with details of the thickness, heights and pitch, with the tolerances. The tolerances have at least to follow those defined for each product in §A1.5.
- ♦ the number and position of the weld points for the panel and the fins,
- ♦ the drawing of the grill and side plates, with all the dimensions.

**\* For extruded aluminium alloy radiators:**

- ♦ a drawing of the head(s), with a cross-section and all the dimensions and tolerances,
- ♦ a cross-section of the section with the dimensions and tolerances.

**\* For tube radiators:**

- ♦ the position of the baffle (where appropriate),
- ♦ the position and dimensions of the injection tube for each model (if any),
- ♦ a view of the fin panel, with details of the thickness, heights and pitch, with the tolerances. The tolerances have at least to follow those defined for each product in §A1.5.
- ♦ the position and number of the weld points for the fins,
- ♦ the drawing of the grill and side plates (if relevant), with all the dimensions.

**\* For convectors:**

- ♦ a definition drawing of the fins with details, in particular, of the thickness, height, length and pitch, with their tolerances. The tolerances have at least to follow these defined in the clauses §A1.5.
- ♦ a definition drawing of the housing, with all the dimensions of the space requirements and their tolerances,
- ♦ a drawing of the grill with all the dimensions.



**FA-02**

**DECLARATION OF CONFORMITY**

I the undersigned .....

acting as: manager of the SARL (private limited company): <sup>(1)</sup>

**Chairman of the Board of Directors;**<sup>(1)</sup> .....

**Chairman of the Private limited company** <sup>1</sup>: .....

whose head office is located at: .....

Hereby warrant that the products designated by:

- the trademark: .....
- the trade name of the range: .....

meet all current European directives and national regulations applying to the products.

Moreover, I agree to provide EUROVENT CERTITA CERTIFICATION with any certificates or declarations upon request.

Date and signature of the legal representative of the applicant/holder

(1) Delete as appropriate.

## LETTER TEMPLATE

**APPLICATION FOR THE MAINTAIN OF THE RIGHT TO USE THE NF MARK**

(To be drawn up on the holder's headed paper)

EUROVENT CERTITA Certification  
M. le Directeur Général,  
à l'attention du chargé d'affaire  
[34 rue Laffitte](#)  
75009 PARIS (FRANCE)

subject: **NF047 mark - Application to maintain the right to use the NF mark**

Dear Sir,

I am writing to you to apply for the maintain of the right to use the NF mark for the range that only differs from the NF certified range by its trade mark and/or its range name and /or its model name.

| Reference of the original range |                | New designation of the range |            |                |
|---------------------------------|----------------|------------------------------|------------|----------------|
| Range Name                      | Model Name (*) | Trade mark                   | Range Name | Model Name (*) |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |

(\*) The information in these columns can be directly fill in on the declaration list of this application.  
In this case, you have to copy the number in the column "Model number" from the original declaration list and paste it in the new declaration list in the column "Master model number"

Remark: if the certificate must be issued in in the name of the beneficiary company of this application, please fill in information below:

- . Company name: .....
- . Address .....
- . Country .....

**Invoicing:****- administrative costs for the instruction of this application (1)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

**- Administrative operating costs according to the price list in force (2)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

Yours faithfully,

**(2) Date and signature  
of the legal representative  
of the beneficiary Company**

**Date and signature  
of the legal representative  
of the holder**

**(1)** Cross the case concerned

**(2)** Only applied to the application for the maintain for third parties.

## A1.8 PROVISION ON DOCUMENTATION

The general provisions applying to the markings on the documentation defined in paragraph 2.4.3 of the reference standard apply to these products.

The purpose of this paragraph is to define the additional requirements to be included in the holder's hardcopy or electronic documentation.

The documentation must include at least the following information:

- ✓ the name and/or reference;
- ✓ the dimensions of the products (height, length, depth);
- ✓ the maximum operating pressure;
- ✓ the thermal output at the base element, or if it is not certified for each model;
  - . the thermal output must be given at  $\Delta T$  50K (75°C/65°C) and  $\Delta T$  30K (55°C/45°C);
  - . the type of connection used in the tests to determine the output must be specified, if the appliance is not designed to be connected in accordance with the connection method specified in standard EN 442 A1.4.2;
  - . if the appliances are certified with and without fittings (grill and/or side plates), their output must be entered in separate table to avoid any risk of misinterpretation;
  - . if the thermal output was certified for the NF mark under special conditions that differ from those specified in standard EN 442-2 (see the date of the applicable standard in A1.4.2), then they must be specified;
  - . the following must be specified for convectors:
    - the reference flow rate (at  $\Delta T$  50K);
    - the correction coefficients according to the flow rate, next to the output.
- ✓ the date of publication of the documentation.

Additional information may also be provided, such as:

- ✓ the material;
- ✓ the gradient/exponent "n" of the characteristic equation of the range;
- ✓ head losses;
- ✓ the nominal flow rate.

The holder is advised to send the draft documentation to EUROVENT CERTITA CERTIFICATION for verification before printing and distribution.

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## TECHNICAL APPENDIX 2

### Additional specifications for

# CEILING-MOUNTED HOT WATER RADIANT PANELS

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### A2.1 SCOPE

This part of reference standard NF- 047 specifies the specific provisions applying to ceiling-mounted hot water radiant panels covered by standard EN 14037 (see the current dates of these standards in §A2.2) for their heating function.

**The certified characteristics are:**

- ✓ The thermal output,
- ✓ The maximum operating pressure.

### A2.2 REFERENCE DOCUMENTS

The standards listed below refer to the standards applying to the products but are not exhaustive.

The following standards are applicable to the products:

**EN 14037-1:** Dec. 2016 - Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 1: Pre-fabricated ceiling mounted radiant panels for space heating - Technical specifications and requirements

**EN 14037-2:** Dec. 2016 - Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 2: Pre-fabricated ceiling mounted radiant panels for space heating. Test method for thermal output

**EN 14037-3:** Dec. 2016 - Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 3: Pre-fabricated ceiling mounted radiant panels for space heating. Rating method and evaluation of radiant thermal output

**EN 14037-5:** Dec. 2016 - Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 5: Open or closed heated ceiling surfaces. Test method for thermal output

## A2.3 DEFINITIONS

The definition of the products and ranges is found in standard EN 14037 (part 1 and 2) (see date of the applicable standard in §A2.2).

## A2.4 TECHNICAL SPECIFICATIONS AND CHARACTERIZATION METHODS

### A2.4.1 Determination of the output of the appliances

The number of products is selected and the output determined according to the test methods defined in standard EN 14037-2 (see date of the applicable standard in §A2.2).

If he so wishes, the applicant/holder can ask the laboratory to test more appliances than the number specified in standard EN 14037-2 (see the current dates of these standards in §A2.2) or the test plans.

If, in certain special cases, the selection method described in standard EN 14037 (see the current dates of these standards in §A2.2) cannot define them, then EUROVENT CERTITA CERTIFICATION is free to choose the models, possibly in conjunction with one of the mark's laboratories.

## A2.5 QUALITY CONTROL SPECIFICATIONS

The quality control provisions stated in part 2 of this reference standard apply to these products.

The manufacturer shall also apply the following specific requirements:

### A2.5.1 Inspection of the components and raw materials

. The manufacturer must inspect the components used to manufacture the appliances or take other measures needed to guarantee the conformity of the products. Special attention must be paid to the following parts:

- tubes,
- sheet metal,
- insulating materials,
- paint.

It is recommended to request a certificate of analysis (for the tubes and sheet metal, compliant with standard EN 10204, paragraph §2.2) (see the current dates of these standards in §A2.2) from the suppliers for the products listed above.

. The manufacturer shall check the thickness and outer diameter of the tubes.

. The manufacturer shall check the thickness and surface condition of steel coils (no rust).

### A2.5.2 Inspections during production

**NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed**

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The manufacturer must perform at least the following inspections, in accordance with its own sampling plan.

Inspections shall be made whenever changes are made to the manufacturer program or at least once a day.

List of inspections:

- Length of the tubes,
- Length of the radiant metal panel,
- Width of the radiant metal panel,
- Height of the edges on the sides,
- Distance between the tubes,
- Distance between the axes of the fitting points.

**A2.5.3 Inspection of the fitting points**

The manufacturer shall carry out strength tests in accordance with paragraph 5.4 “Fitting point” of the standard EN 14037-1 (see the current dates of these standards in §A2.2). The frequency of the inspections shall be:

- For the load test with 3 times the total weight of the panel, at least once a week,
- For the load test with 5 times the total weight of the panel, at least once a month.

**A2.5.4 Weld inspections**

The manufacturer must periodically take samples (at least once a day) to perform tests (destructive or non-destructive), defined according to a suitable method, on the tubes welded onto the radiant panel.

**A2.5.5 Paint inspections**

Fire reaction:

When, according to paragraph 5.1.2 of standard EN 14037-1 (see the current dates of these standards in §A2.2) this is required and the paint or organic coatings must represent less than 1% by weight or volume of the product, the manufacturer shall periodically check (once a week), using appropriate means (any suitable means), that the products comply with the requirements applying to reaction to fire (EN 14037-1 §5.12 (see the current dates of these standards in §A2.2)). The effectiveness of the device must be proven.

**A2.6 SPECIFIC TEST METHODS**

The test methods for determining thermal output as defined in standard EN 14037 (see the current dates of these standards in §A2.2) apply.

## A2.7 CERTIFICATION FILE

In addition to the general documents specified in Part 8, the applicant shall also supply the documents listed below:

- Admission application (initial or complementary) or application for a modification on certified range:
  - ✓ The product declaration list (Excel file to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ The manufacturing drawing(s), in accordance with the instructions in form FB-02
  - ✓ The test reports and/or catalogue from a laboratory that:
    - ✓ . possesses the NF mark,
    - ✓ . is notified within the meaning of Construction Products Regulation 305-2011
  - ✓ Declaration of conformity form FB-01
  - ✓ Minimum number and declaration of conformity and stability of the fitting points
  - ✓ Report (approved by management) confirming that the sample was made with the same materials and processes as the standard production models (excluding the insulating materials)
  
- Maintain application:
  - ✓ The product declaration list (Excel file to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ Maintain letter of the right to use NF mark



**FB-01**

**DECLARATION OF CONFORMITY**

I the undersigned .....

acting as: manager of the SARL (private limited company):<sup>(1)</sup>

Chairman of the Board of Directors;<sup>(1)</sup> .....

Chairman of the Private limited company 1: .....

whose head office is located at: .....

Hereby warrant that the products designated by:

- the trademark: .....
- the trade name of the range: .....

meet all current European directives and national regulations applying to the products.

Moreover, I agree to provide EUROVENT CERTITA CERTIFICATION with any certificates or declarations upon request.

Date and signature of the legal representative of the applicant/holder

(1) Delete as appropriate.

## LETTER TEMPLATE

**APPLICATION FOR THE MAINTAIN OF THE RIGHT TO USE THE NF MARK**

(To be drawn up on the holder's headed paper)

EUROVENT CERTITA Certification  
M. le Directeur Général,  
à l'attention du chargé d'affaire  
[34 rue Laffitte](#)  
75009 PARIS (FRANCE)

subject: **NF047 mark - Application to maintain the right to use the NF mark**

Dear Sir,

I am writing to you to apply for the maintain of the right to use the NF mark for the range that only differs from the NF certified range by its trade mark and/or its range name and /or its model name.

| Reference of the original range |                | New designation of the range |            |                |
|---------------------------------|----------------|------------------------------|------------|----------------|
| Range Name                      | Model Name (*) | Trade mark                   | Range Name | Model Name (*) |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |

(\*) The information in these columns can be directly fill in on the declaration list of this application.  
In this case, you have to copy the number in the column "Model number" from the original declaration list and paste it in the new declaration list in the column "Master model number"

Remark: if the certificate must be issued in in the name of the beneficiary company of this application, please fill in information below:

- . Company name: .....
- . Address .....
- . Country .....

**Invoicing:****- administrative costs for the instruction of this application (1)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

**- Administrative operating costs according to the price list in force (2)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

Yours faithfully,

**(2) Date and signature  
of the legal representative  
of the beneficiary Company**

**Date and signature  
of the legal representative  
of the holder**

**(1)** Cross the case concerned

**(2)** Only applied to the application for the maintain for third parties.

## FB02

**INSTRUCTIONS FOR THE SUPPLY OF DRAWINGS**

- One drawing per range or model, containing:

- ♦ the different detailed views and cross-sections required to define the appliance with the different thicknesses and the dimensions with their tolerances.
- ♦ all dimensions with tolerances, that impact the emission of heat (without forgetting the overall length and depths, the length and depth of the emitter, the height and the centre-to-centre distance),
- ♦ the main dimensions of other models (height) with their tolerances, presented in a table,
- ♦ the number, scale, name of the company and date,
- ♦ the product material (with the reference),
- ♦ details of the welds and other assembly methods, the number of connection points between the dry surface and the humid surface by metre and by tube,
- ♦ details of the materials used, and in particular the diameter of the tube,
- ♦ the nominal thickness of the walls of the humid and dry surfaces,
- ♦ the specification of the surface treatment,
- ♦ the maximum distance between the axes of the fitting points,
- ♦ the method used to connect the dry surface to the humid surface.

## A2.8 PROVISION ON DOCUMENTATION

The general provisions applying to the markings on the documentation defined in paragraph 2.4.3 of the reference standard apply to these products.

The purpose of this paragraph is to define the additional requirements to be included in the holder's hardcopy or electronic documentation.

The documentation must include at least the following information:

- ✓ the name and/or reference;
- ✓ the dimensions of the products (height, length, depth);
- ✓ the maximum operating pressure;
- ✓ the thermal output of the basic resistance at  $\Delta T$  55K;
- ✓ the date of publication of the documentation.

Additional information may also be provided, such as:

- ✓ the material;
- ✓ the gradient/exponent "n" of the characteristic equation of the range;
- ✓ head losses.

The holder is advised to send the draft documentation to EUROVENT CERTITA CERTIFICATION for verification before printing and distribution.

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## TECHNICAL APPENDIX 3

### Additional specifications for

# FAN-ASSISTED RADIATORS AND CONVECTORS

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### A3.1 SCOPE

This appendix of reference standard NF - 047 states the specific requirements for fan-assisted appliances that use water for their heating function.

The appendix applies to fan-assisted radiators and convectors.

This reference standard does not apply any thermal output limits for the certification of products. The output of products that is below or above the limits specified in standard EN 442 (see date of the applicable standard in §A3.2) for the execution of tests is determined by calculation.

The certification does not apply to fan-assisted appliances fed with air from outside the building and trench convectors.

**The certified characteristics are:**

- ✓ The thermal output of the fan when working and at a standstill,
- ✓ The maximum operating pressure,
- ✓ The sound power level.

For the electric part:

- ✓ The standby power,
- ✓ The power when in operation.

### A3.2 REFERENCE DOCUMENTS

The standards listed below refer to the standards applying to the products but are not exhaustive.

The following standards are applicable to the products:

**EN 16430-1:** January 2015, Fan assisted radiators, convectors and trench convectors. Part 1 - Technical specifications and requirements.

**EN 16430-2:** January 2015, Fan assisted radiators, convectors and trench convectors. Part 2 - Test method and rating for thermal output.

**EN 442-1:** December 2014, Radiators and convectors – Part 1: Technical specifications and requirements.

**EN 442-2:** December 2014, Radiators and convectors – Part 2: Test methods and rating.

**EN 60335-2-80:** 2004 (A1: 2004 + A2: 2009), Household and similar electrical appliances - Part 2-80 Particular requirements for fans.

**EN 50564 / 2011 / 2012,** Electrical and electronic household and office equipment. Measurement of low power consumption.

**EN 50106:** 2009, Safety of household and similar electrical appliances – Particular rules for appliances under the scope of standard EN 60335-1.

**EN ISO 3744:** 2012, Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane.

**EN ISO 3745:** 01/2013, Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Precision methods for anechoic and hemi-anechoic rooms.

### A3.3 DEFINITIONS

The definition of the products is given in standards EN 442 (part 1 and 2) (see date of the applicable standard in §A3.2) and EN 16430-2 (see date of the applicable standard in §A3.2).

#### A range of fan-assisted products:

The product range is made up of:

- ✓ a range of appliances as defined in §3 of standard EN 442-2 (see date of the applicable standard in A3.2),
- ✓ the same fan type.

## A3.4 TECHNICAL SPECIFICATIONS AND CHARACTERIZATION METHODS

### A3.4.1 Determining the output

Thermal output is measured according to the test methods defined in standard EN 16430-2 (see date of the applicable standard in § A3.2). Thermal output is determined with the fan stopped and running. The values in the test report are the certified values. No tolerance is allowed for the declared outputs.

When monitoring the product, the permissible acceptance criterion (tolerance) between the certified and measured outputs is -4%.

The number of products to be tested is determined according to the criteria specified in standard EN 16430-2 (see date of the applicable standard in §A3.2).

The output of panel radiators is determined with the appliances fitted at least with their grill and side plates, if this version exists in the applicant's / holder's catalogue.

For "ON/OFF" all-or-nothing fans, the measurement is taken at the fan's nominal speed.

For fans with variable or adjustable speeds, the measurement is taken at the fan's minimum and maximum speeds, and at the intermediate speed (where relevant), as indicated by the applicant in the application for the right to use the NF mark.

Conditions for determining the outputs:

- ✓ the thermal output is measured at  $\Delta T$  50K and calculated at  $\Delta T$  30K, even if a range of appliances is not designed for use at  $\Delta T$  50K. These two outputs are certified.

### A3.4.2 Mechanical resistance tests and deformation measurements

For panel, lamellar and flat-tube radiators, each selected sample is tested to measure the output in accordance with paragraph A1.4.2 of technical appendix 1. Conformity is confirmed if the appliance does not leak and is deformed by less than 10% after the test.

### A3.4.3 Electric input power

There are three types of variation of ventilation speeds:

- ✓ all-or-nothing, "On / Off",
- ✓ speed variation controlled by the supply voltage,
- ✓ several pre-set speeds selected using a switch.

The certified power is determined at the minimum, intermediate and maximum speeds.



## NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed

The measurements are given with two decimal places, applying the following rounding rules:

- ✓ between 0.01 and 0.04, rounded down to the nearest hundredth,
- ✓ between 0.05 and 0.09, rounded up to the nearest hundredth.

Evaluation of the conformity of the declared values:

Conformity is confirmed if the measured value is no more than 5% than the value declared by the applicant in its application for the right to use the NF mark.

There are two possible cases of non-conformity:

- ✓ Only one declared value is found not to comply with the measured value. This value is corrected and the measured value is retained.
- ✓ Several declared values do not comply with the measured values. The correction is made as follows:

The declared values found to be non-compliant with the measured values are corrected, and the measured values are retained.

The declared values that do not correspond to the tested appliances are corrected by increasing them by the mean of the differences between the valued measurements and the non-compliant declared values.

Example for min. and max. outputs:

| <b>Before correction</b> |             |            |              |            |              |            |              |            |
|--------------------------|-------------|------------|--------------|------------|--------------|------------|--------------|------------|
| <i>Model</i>             | <i>N° 1</i> |            | <i>No. 2</i> |            | <i>No. 3</i> |            | <i>No. 4</i> |            |
| <i>Output</i>            | <i>min</i>  | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> |
| <i>Declared output</i>   | 2.11        | 3.31       | 2.78         | 4.11       | 3.55         | 5.30       | 4.98         | 7.1        |
| <i>Measured output</i>   | 2.18        | 3.51       | 2.97         | 4.05       | -            | -          | 5.25         | 6.95       |
| <i>Difference (%)</i>    | -           | 6          | 7            | -          | -            | -          | 5.5          | -          |

$$\text{Mean difference} = (6+7+5.5)/3 = 6.17\%$$

| <b>After correction</b>        |             |             |              |            |              |            |              |            |
|--------------------------------|-------------|-------------|--------------|------------|--------------|------------|--------------|------------|
| <i>Model</i>                   | <i>N° 1</i> |             | <i>No. 2</i> |            | <i>No. 3</i> |            | <i>No. 4</i> |            |
| <i>Output</i>                  | <i>min</i>  | <i>max</i>  | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> |
| <i>Declared output</i>         | 2.11        | 3.31        | 2.78         | 4.11       | 3.55         | 5.30       | 4.98         | 7.1        |
| <b><i>Corrected output</i></b> | 2.24        | <b>3.51</b> | <b>2.97</b>  | 4.36       | 3.77         | 5.63       | <b>5.25</b>  | 7.54       |

$$\text{Example: } 2.1 \times 6.17\% = 2.24 \text{ W}$$

#### A3.4.4 Standby power

The standby power is measured when the appliance is switched on and the fan(s) at a standstill. Conformity is confirmed if the measured value is not 5% greater than the value included in the applicant's application for the right to use the NF mark.

If the value is declared to be non-compliant with the measured value, it is returned to the measured value by correcting the applicable tolerance (defined previously).

#### A3.4.5 Electrical safety

To obtain the right to use the NF mark, appliances fitted with fans must meet the requirements of standard EN 60335-2-40 (see date of the applicable standard in §A3.2).

#### A3.4.6 Sound power level

Three situations are possible:

- ✓ all-or-nothing, "On/Off" fan:

The certified value is the value declared by the applicant when the fan is in nominal operation.

- ✓ Variable speed fan:

The certified values are the values declared by the applicant when the fan is operating at minimum, intermediate and maximum speed.

- ✓ Multiple speed fan (adjustable):

The certified values are the values declared by the applicant at each speed.

Sound power must be determined according to one of the standards specified in §A3.2. Measurements must be taken at least according to class 2.

The measured values are included in the test report of the individual units. The rounding rule is: 0.1 and 0.4, round down to the nearest integer. Between 0.5 and 0.9, round up to the nearest integer.

The appliances from the range used to determine the thermal outputs will be tested.

#### Mounting configuration:

For radiators/convectors, the appliance to be tested must be installed according to the test plan described in paragraph 9C-6.

For measurements in the open air, as per the standard EN ISO 3744 or EN ISO 3745, (see the current dates of these standards in §A3.2), a supporting wall with the following characteristics must be installed: the density must be  $>15 \text{ kg/m}^2$  (e.g., bonded sandwich type plasterboard), 2.50 m high, 4.60 m long (corresponding to one half of the wavelength at the lowest frequency to be measured).

The acoustic test shall be conducted at temperatures of between 15°C and 25°C, without connecting the appliance, with no water inside the appliance and with a dry coil surface.

#### Evaluation of the conformity of the declared values:

Conformity is confirmed if the measured value is not 2 dB(A) greater than the value included in the applicant's application for the right to use the NF mark.

## NF mark- Radiators, Convectors and Ceiling-mounted radiant panels, with hot water, fan and mixed

There are two possible cases of non-conformity:

- ✓ Only one declared value is found not to comply with the measured value. This value is corrected and the measured value is retained.
- ✓ Several declared values do not comply with the measured values. The correction is made as follows:

The declared values found to be non-compliant with the measured values are corrected, and the measured values are retained.

The declared values that do not correspond to the tested appliances are corrected by increasing them by the mean of the differences between the valued measurements and the non-compliant declared values.

Example:

| <b>Before correction</b> |             |            |              |            |              |            |              |            |
|--------------------------|-------------|------------|--------------|------------|--------------|------------|--------------|------------|
| <i>Model</i>             | <i>N° 1</i> |            | <i>No. 2</i> |            | <i>No. 3</i> |            | <i>No. 4</i> |            |
| <i>Output</i>            | <i>min</i>  | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> |
| <i>Declared output</i>   | 30          | 37         | 32           | 39         | 31           | 40         | 31           | 40         |
| <i>Measured output</i>   | 29          | 40         | 35           | 43         | -            | -          | 30           | 41         |
| <i>Difference</i>        | -           | 3          | 3            | 4          | -            | -          | -            | -          |

Mean difference =  $(3+3+4)/3 = 3.3$ , or a correction value returned to the unit of 3.

| <b>After correction</b>        |             |            |              |            |              |            |              |            |
|--------------------------------|-------------|------------|--------------|------------|--------------|------------|--------------|------------|
| <i>Model</i>                   | <i>N° 1</i> |            | <i>No. 2</i> |            | <i>No. 3</i> |            | <i>No. 4</i> |            |
| <i>Output</i>                  | <i>min</i>  | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> | <i>min</i>   | <i>max</i> |
| <i>Declared output</i>         | 30          | 37         | 32           | 39         | 31           | 40         | 31           | 40         |
| <b><i>Corrected output</i></b> | 29          | <b>40</b>  | <b>35</b>    | <b>43</b>  | <b>34</b>    | <b>43</b>  | 30           | 41         |

### A3.5 QUALITY CONTROL SPECIFICATIONS

The quality control provisions stated in part 2 and in technical appendix 1 §A15 of this reference standard apply to these products.

The manufacturer shall also implement:

Acceptance check:

The output of fans must be checked according to the manufacturer's sampling plan, in addition to the documentary check.

Inspection of the finished product:

Earth continuity and dielectric rigidity tests must be carried out on each finished product according to standard EN 50106 (see date of the applicable standard in §A3.2).

## A3.6 TEST METHODS

Nominal (standard) thermal output is determined according to standard EN 442-2 (see date of the applicable standard in §A1.2).

### A3.6.1 Determining thermal output

#### A3.6.1.1 *Static-mode radiators and convectors*

Nominal (standard) thermal output is determined according to standard EN 442-2 (see date of the applicable standard in §A1.2).

#### A3.6.1.2 *Fan-assisted radiators and convectors*

The determination of the thermal output and the requirements applying to the measuring instruments are specified in standard EN 16430-2 (see date of the applicable standard in §A3.2).

## A3.7 CERTIFICATION FILE

In addition to the general documents specified in Part 8, the applicant shall also supply the documents listed below:

- Admission application (initial or complementary) or application for a modification on certified range:
  - ✓ The product declaration list (Excel workbook to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ The manufacturing drawing(s), in accordance with the instructions in form FC-02
  - ✓ Electrical wiring diagram
  - ✓ Test report(s) and/or catalogue to determine the outputs
  - ✓ Operating instructions
  - ✓ Declaration of conformity form FC-01 (only for an admission application)
- Maintain application:
  - ✓ The product declaration list (Excel file to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ Maintain letter of the right to use NF mark

**FC-01**

**DECLARATION OF CONFORMITY**

I the undersigned .....

acting as: manager of the SARL (private limited company): <sup>(1)</sup>

Chairman of the Board of Directors;<sup>(1)</sup> .....

Chairman of the Private limited company <sup>1</sup>: .....

whose head office is located at: .....

Hereby warrant that the products designated by:

- the trademark: .....
- the trade name of the range: .....

meet all current European directives and national regulations applying to the products.

Moreover, I agree to provide EUROVENT CERTITA CERTIFICATION with any certificates or declarations upon request.

Date and signature of the legal representative of the applicant/holder

(1) Delete as appropriate.

## LETTER TEMPLATE

**APPLICATION FOR THE MAINTAIN OF THE RIGHT TO USE THE NF MARK**

(To be drawn up on the holder's headed paper)

EUROVENT CERTITA Certification  
 M. le Directeur Général,  
 à l'attention du chargé d'affaire  
 34 rue Laffitte  
 75009 PARIS (FRANCE)

subject: **NF047 mark - Application to maintain the right to use the NF mark**

Dear Sir,

I am writing to you to apply for the maintain of the right to use the NF mark for the range that only differs from the NF certified range by its trade mark and/or its range name and /or its model name.

| Reference of the original range |                | New designation of the range |            |                |
|---------------------------------|----------------|------------------------------|------------|----------------|
| Range Name                      | Model Name (*) | Trade mark                   | Range Name | Model Name (*) |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |

(\*) The information in these columns can be directly fill in on the declaration list of this application.  
 In this case, you have to copy the number in the column "Model number" from the original declaration list and paste it in the new declaration list in the column "Master model number"

Remark: if the certificate must be issued in in the name of the beneficiary company of this application, please fill in information below:

- . Company name: .....
- . Address .....
- . Country .....

**Invoicing:****- administrative costs for the instruction of this application (1)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

**- Administrative operating costs according to the price list in force (2)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

Yours faithfully,

**(2) Date and signature  
of the legal representative  
of the beneficiary Company**

**Date and signature  
of the legal representative  
of the holder**

**(1)** Cross the case concerned

**(2)** Only applied to the application for the maintain for third parties.

## FC-02

**INSTRUCTIONS FOR THE SUPPLY OF DRAWINGS****\* For all types of radiators/convectors:**

- One drawing per range or model, containing:
  - ♦ the different detailed views and cross-sections required to define the appliance. These shall show the dimensions with their tolerances, with the various thicknesses having an impact on the thermal heat output and on pressure resistance of the appliance.
  - ♦ position of the fans,
  - ♦ all the tolerances dimensions, that impact the emission of heat (without forgetting the overall length and depths, the length and depth of the emitter, the height and the centre-to-centre distance. The tolerances have at least to follow these defined in the clauses §A1.5.
  - ♦ the main dimensions of other models (height) with their tolerances, presented in a table,
  - ♦ the number, scale, name of the company and date,

**\* For panel radiators:**

- ♦ a view of the fin panel, with details of the thickness, heights and pitch, with the tolerances. The tolerances have at least to follow those defined for each product in §A1.5.
- ♦ the number and position of the weld points for the panel and the fins,
- ♦ the drawing of the grill and side plates, with all the dimensions.

**\* For extruded aluminium alloy radiators:**

- ♦ a drawing of the head(s), with a cross-section and all the dimensions and tolerances,
- ♦ a cross-section of the section with the dimensions and tolerances.

**\* For tube radiators:**

- ♦ the position of the baffle (where appropriate),
- ♦ the position and dimensions of the injection tube for each model (if any),
- ♦ a view of the fin panel, with details of the thickness, heights and pitch, with the tolerances. The tolerances have at least to follow those defined for each product in §A1.5.
- ♦ the position and number of the weld points for the fins,
- ♦ the drawing of the grill and side plates (if relevant), with all the dimensions.

**\* For convectors:**

- ♦ A definition drawing of the fins with details, in particular, of the thickness, height, length and pitch, with their tolerances,
- ♦ A definition drawing of the housing, with all the dimensions of the space requirements and their tolerances,
- ♦ A drawing of the grill mentioning all the dimensions.



### A3.8 PROVISION ON DOCUMENTATION

The general provisions applying to the markings on the documentation defined in paragraph 2.4.3 of the reference standard apply to these products.

The purpose of this paragraph is to define the additional requirements to be included in the holder's hardcopy or electronic documentation.

The documentation shall meet the regulatory and normative requirements applying to electrical safety. It shall also include at least the following information:

- ✓ the name and/or reference;
- ✓ the dimensions of the radiators (height, length, depth);
- ✓ the maximum operating pressure;
- ✓ the thermal output with:

. the fans when idle,

. the fans when running (*minimum, intermediate, maximum and others, if switchable*),

The thermal outputs must be given at  $\Delta T$  50K (75°C/65°C) and  $\Delta T$  30K (55°C/45°C). However, if the range is not designed to work at  $\Delta T$  50K, then the outputs at this  $\Delta T$  need not be indicated in the documentation, but the holder must indicate the output at the maximum operating  $\Delta T$  of the appliances.

The following must be specified for convectors:

- the reference flow rate (at  $\Delta T$  50K);
- the correction coefficients according to the flow rate, next to the output.

The connection method used in the tests to determine the output must be specified, if the appliance is not designed to be connected in accordance with the connection method specified in standard EN 442 (see date of the applicable standard in §A1.2).

- ✓ the sound powers with:

. the fans when running (*minimum, intermediate, maximum and others, if switchable*),

- ✓ the standby electric output;
- ✓ the electric input power when operating at minimum, intermediate and maximum speeds, and at other speeds, if adjustable;
- ✓ the date of publication of the documentation.

Additional information may also be provided, such as:

- ✓ the material;
- ✓ the gradient/exponent "n" of the characteristic equation of the range;
- ✓ head losses;
- ✓ the nominal water flow.

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## TECHNICAL APPENDIX 4

### Additional specifications for

## MIXED RADIATORS

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#### A4.1 SCOPE

This appendix to reference standard NF - 047 states the specific requirements applying to mixed appliances that use hot water and electricity, in which hot water is the main energy source and electricity is used as an auxiliary source, in particular between seasons.

To benefit from the right to use the NF mark, mixed radiators shall:

- benefit from the right to use the NF mark “Radiators, Convectors and Ceiling-mounted, fan-assisted and mixed radiant panels” for their hot water heating function,
- be fitted with a control system that stops the resistor, either by a timing device and/or by the control of the ambient temperature or the temperature of the water,
- meet the requirements of standard EN 60335-2-30 **and/or** EN 60335-2-43 (see the current dates of these standards in §A4.2),
- be assembled in the factory. The installation of the auxiliary electric heating at a later date is forbidden,
- be fitted with a temperature limiter (electric circuit breaker) in the event of abnormal use.

**The certified characteristics are:**

- ✓ the surface temperature of mixed radiators with a resistor,
- ✓ the air outlet temperature for mixed radiators with a blower,
- ✓ the output of the resistor and/or of the blower.

#### A4.2 REFERENCE DOCUMENTS

The standards listed below refer to the standards applying to the products but are not exhaustive.

The following standards are applicable to the products:

**EN 442-1:** December 2014, Radiators and convectors – Part 1: technical specifications and requirements.

**EN 442-2:** December 2014, Radiators and convectors – Part 2: Test methods and rating.

**EN 60335-1:** 2012 (A1 + A2 : 2019) (+ A11 : 2014 ; A13 : 2017 ; A14 : 2019. A15/ 2021), Household and similar electrical appliances - Part 1: general requirements.

**EN 60335-2-30:** 2009 (A11: 2012; A12: 2020) - **A1:2020 - A2: 2022**, Household and similar electrical appliances - Part 2-30: Particular rules for space heating appliances.

**Remark: a transition period is applied for the amendment A2: 2022 until 20/06/2025.**

**EN IEC 60335-2-43:** **2020 + EN IEC 60335-2-43/A11**, Household and similar electrical appliances - Part 2-43: Particular rules for clothes dryers and towel warmers.

**EN 50106:** **2008**, Safety of household and similar electrical appliances – Particular rules for routine tests referring to appliances under the scope of the standard EN 60335-1.

## A4.3 DEFINITIONS

### Radiator

See the definition in paragraph 3 of standard EN 442-2 (see date of the applicable standard in §A4.2).

### Radiator and mixed towel warming radiator without blower

Comprises a hot water central heating radiator, a **heating element** and a control system. The immersed **heating element** is mounted inside the radiator in direct contact with the central heating circuit.

### Radiator and mixed towel warming radiator with blower

Comprises a hot water central heating radiator, an electric blower and a control system. The blower is attached to the radiator and cannot be detached.

### Product range

The product range is made up of:

- ✓ a range of appliances as defined in paragraph 3 of standard EN 442-2 (see date of the applicable standard in §A4.2),
- ✓ the same **heating element** or blower technology,
- ✓ the same control system of the auxiliary electric heating.

## A4.4 TECHNICAL SPECIFICATIONS AND CHARACTERIZATION METHODS

### A4.4.1 Electrical safety of mixed towel warming radiators

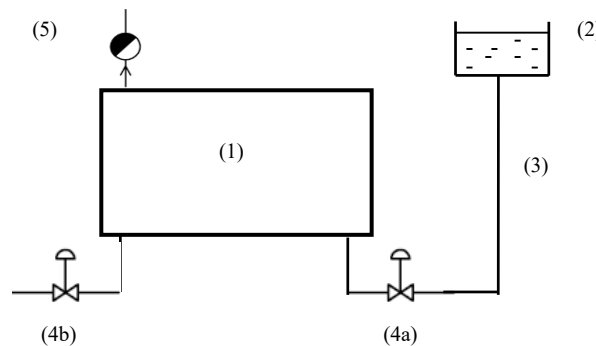
The radiator must meet the requirements of standard EN 60335-2-30 and/or EN 60335-2-43 (see the current dates of these standards in §A4.2).

For radiators and towel warming radiators with a [heating element](#), it is tolerated that the tests are carried out on an appliance filled with a *heat transfer fluid (water, oil)* and plugged by the manufacturer. Otherwise the specifications described below must be met.

Specification for radiators and mixed towel warming radiators with a [heating element](#):

The appliance shall be tested in accordance with the instructions for installation and use described in the manufacturer's manual. The radiator shall be installed under the following conditions for the surface temperature tests:

The inlet of the radiator is connected to a water supply, as shown in the diagram below (any other equivalent arrangement may also be considered). The shut-off device at the water tank end must remain open during the tests and the second shut-off device (4b) must be closed to prevent the water from escaping. It is necessary to check the radiator and the supply circuit for air bubbles when filling the radiator with water.



- (1) mixed radiator
- (2) water tank
- (3) feed pipe
- (4a and 4b) shut-off devices
- (5) drain

### A4.4.2 Determining surface temperature

#### A4.4.2.1 For mixed towel warming radiators without blower

The test is carried out in accordance with the specifications of standard EN 60335-2-43 (by covering the radiator with 4 layers of linen,  $P_n$  at 1.15) (see date of the applicable standard in §9D-2). The measured surface temperature must not exceed 75 K, namely for room at 20°C, a maximum temperature of 95°C.

**A4.4.2.2 For mixed radiators without blower**

The test is carried out in accordance with the specifications of standard EN 60335-2-30 (see date of the applicable standard in §A4.2). The measured surface temperature must not exceed 70 K, namely for room at 20°C, a maximum temperature of 90°C.

**A4.4.2.3 For mixed radiators with blower (without heating element)**

The test is carried out in accordance with the specifications of standard EN 60335-2-30 (see date of the applicable standard in §A4.2). The maximum measured surface temperature of the air outlet vents must not exceed 100 K, namely for a room at 20°C a maximum temperature of 120°C.

**A4.4.3 Abnormal operating condition for radiators and mixed towel warming radiators with heating element**

The test consists in checking the operation of the thermal protection device when air is accumulated inside the radiator, possibly causing the heating element to emerge from the water. Two smaller radiators in the range shall be tested, one with a power heating element with the lowest rating, the other with a power heating element with the highest rating.

The temperature of the appliance is measured by covering it with felt. The safety device should cut out before the radiator's surface temperature reaches 100K, namely for a room at 20°C, a maximum temperature of 120°C.

If the safety device fails, the ultimate protection should cut out before the radiator's surface temperature reaches 150 K, namely for a room at 20°C, a maximum temperature of 170°C.

The laboratory shall make sure that the interior of the radiator is dry in order to prevent the formation of steam during the course of the test.

**A4.4.4 Determining the power of the heating element**

Conformity is confirmed if the measured value is within -5% or +10% of the value declared in the applicant's application for the right to use the NF mark.

For radiators and towel warming radiators fitted with a heating element and a blower, the power of each assembly is measured separately.

NB: take into account the power of the electronics and the power of the turbine or fan.

**A4.4.5 Pressure resistance test**

The test is carried out on a finished product from the range at a pressure at least 1.69 times the appliance's maximum operating pressure (Pmax) declared by the manufacturer. The appliance is compliant if the radiator does not leak. The test can be carried out using water or air. Pressure in the product must be maintained for 2 minutes and checked with a pressure gauge having a precision of ±5%.

#### A4.4.6 Tests carried out

The table below explains the various tests performed for admission to the NF mark and for monitoring purposes.

| Process    | EN 60335 (2-30 and/or 2-43) | Surface temperature               | Abnormal operating conditions | Electric power                            | Pressure resistance test |
|------------|-----------------------------|-----------------------------------|-------------------------------|---|--------------------------|
| Admission  | X                           | Covered by EN 60335 (2-30 / 2-43) | X                             | X<br>or covered by EN 60335 (2-30 / 2-43) | X                        |
| Monitoring |                             | X                                 | X                             | X   | X                        |

### A4.5 QUALITY CONTROL SPECIFICATIONS

#### A4.5.1 Requirements for mixed radiators with a heating element

##### Acceptance check:

The manufacturer must determine the checks or other activities necessary to ensure that the products supplied by its suppliers meet the specified requirements.

Electrical heating element must comply with the requirements of standard EN 60335-1 (see date of applicable standard in §A4.2).

##### Verification of tightening torque of the electrical heating element:

Tightening torque of the electrical heating element shall be checked in accordance with the manufacturer's inspection plan. The checks shall be performed at least once a day, or once per production run.

##### Pressure resistance test:

The manufacturer shall carry out pressure resistance tests in accordance with the specification described in the preceding paragraph A4.4.5. The samples shall be taken at least once a week, or once per production run.

##### Inspection of the finished product:

Unit tests shall be performed in order to check the conformity of the following aspects of the appliances:

- ✓ continuity of the earth (for class I radiators),
- ✓ dielectric rigidity (for a class I or II radiator), as defined in standard EN 50106 (see date of the applicable standard in §A4.2),
- ✓ electric power.

#### A4.5.2 Requirements for mixed radiators with blower

##### Acceptance check:

The manufacturer must be able to demonstrate that the blowers are compliant with standard EN 60335-1 (see date of the applicable standard in §A4.2).

In addition to the documentation check, the output of the blowers shall be checked in accordance with the sampling plan described by the manufacturer.

##### Inspection of the finished product:

Unit tests shall be performed in order to check the conformity of the following aspects of the appliances:

- ✓ continuity of the earth (for class I radiators) and dielectric rigidity as defined in standard EN 50106 (for a class I or II radiator) (see date of the applicable standard in §A4.2),
- ✓ electric power.

### A4.6 SPECIFIC TEST METHODS

As standards EN 60335-2-30 and EN 60335-2-43 (see the current dates of these standards in §A4.2) do not cover mixed radiators, the installation specifications for the radiators are given in §A4.4.1. These standards apply to the tests and conformity checks of the appliances.

### A4.7 CERTIFICATION DOCUMENTS

In addition to the general documents specified in Part 8, the applicant shall also supply the documents listed below:

- Admission application (initial or complementary) or application for a modification on certified range:
  - ✓ The product declaration list (Excel file to request from EUROVENT CERTITA CERTIFICATION)
  - ✓ The manufacturing drawing(s), in accordance with the instructions in form FD-01
  - ✓ Provided by an accredited laboratory:
    - . A test report in accordance with standard EN 60335-2-30 and/or EN 60335-2-43 (see the current dates of these standards in §A4.2), for an appliance in the range included in the application,
    - . A test report on the measurement of electric power for each **heating element** and/or blower in the range included in the application.
  - ✓ Provided by a NF047 mark laboratory:
    - . The test report on measurement in abnormal operation conditions for an appliance in the range (see §A4.4.3); one test report on measurement of resistance to pressure for an appliance in the range (see §A4.4.5).
  - ✓ The declaration of conformity form FD-02 (only for admission application)
  - ✓ Operating instructions

- Maintain application:
  - ✓ The product declaration list (Excel file request from EUROVENT CERTITA CERTIFICATION)
  - ✓ Maintain letter of the right to use NF mark



**FD-01****INSTRUCTIONS FOR THE SUPPLY OF DRAWINGS****\* For all types of radiators:**

- One drawing per range or model, containing:

- ♦ the various detailed views and cross-sections required to define the appliance with a heating element or a blower,
- ♦ the main dimensions with their tolerances having an influence on the thermal heat output and pressure resistance of the appliance.
- ♦ the number, scale, name of the company and date,
- ♦ the product material (with the reference).

**\* For panel radiators:**

- ♦ the drawing of the grill and side panels with all the dimensions.

**\* For tube radiators:**

- ♦ the position of the baffle (where appropriate),
- ♦ the drawing of the grill and side plates (if relevant) with all the dimensions.

**FD-02**

**DECLARATION OF CONFORMITY**

I the undersigned .....

acting as: manager of the SARL (private limited company):<sup>(1)</sup>

**Chairman of the Board of Directors;**<sup>(1)</sup> .....  
**Chairman of the public limited company** <sup>1</sup>: .....

whose head office is located at: .....

Hereby warrant that the products designated by:

- the trademark: .....
- the trade name of the range: .....

meet all of the European directives and national regulations in force applicable to the products.

Moreover, I agree to provide EUROVENT CERTITA CERTIFICATION with any certificates or declarations upon request.

Date and signature of the legal representative of the applicant/holder

(1) Delete as appropriate.

## LETTER TEMPLATE

**APPLICATION FOR THE MAINTAIN OF THE RIGHT TO USE THE NF MARK**

(To be drawn up on the holder's headed paper)

EUROVENT CERTITA Certification  
M. le Directeur Général,  
à l'attention du chargé d'affaire  
34 rue Laffitte  
75009 PARIS (FRANCE)

subject: **NF047 mark - Application to maintain the right to use the NF mark**

Dear Sir,

I am writing to you to apply for the maintain of the right to use the NF mark for the range that only differs from the NF certified range by its trade mark and/or its range name and /or its model name.

| Reference of the original range |                | New designation of the range |            |                |
|---------------------------------|----------------|------------------------------|------------|----------------|
| Range Name                      | Model Name (*) | Trade mark                   | Range Name | Model Name (*) |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |
|                                 |                |                              |            |                |

(\*) The information in these columns can be directly fill in on the declaration list of this application.  
In this case, you have to copy the number in the column "Model number" from the original declaration list and paste it in the new declaration list in the column "Master model number"

Remark: if the certificate must be issued in in the name of the beneficiary company of this application, please fill in information below:

- . Company name: .....
- . Address .....
- . Country .....

**Invoicing:****- administrative costs for the instruction of this application (1)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

**- Administrative operating costs according to the price list in force (2)**

- To the holder** of the right to use the NF Mark (of the original range).  
I ask that these expenses are directly charged to me.
- To the beneficiary company from the maintain of the right to use.**  
I ask that these expenses which are in my charge are directly charged to it.

Yours faithfully,

**(2) Date and signature  
of the legal representative  
of the beneficiary Company**

**Date and signature  
of the legal representative  
of the holder**

**(1)** Cross the case concerned

**(2)** Only applied to the application for the maintain for third parties.

## A4.8 PROVISION ON DOCUMENTATION

The general provisions applying to the markings on the documentation defined in paragraph 2.4.3 of the reference standard apply to these products.

The purpose of this paragraph is to define the additional requirements to be included in the holder's hardcopy or electronic documentation.

The documentation shall meet the regulatory and normative requirements applying to electrical safety. It shall also include at least the following information:

- ✓ the name and/or reference;
- ✓ the dimensions of the radiators (height, length, depth);
- ✓ the certified electric powers;
- ✓ the date of publication of the documentation.

The holder is advised to send the draft documentation to EUROVENT CERTITA CERTIFICATION for verification before printing and distribution.

### User manual supplied with the appliance:

The following text shall appear on the manual:

When using the "electric function" of the mixed radiator, only close the inlet tap and NEVER CLOSE THE RETURN in order to allow the fluid to expand towards the system.

PLEASE NOTE: closing the return can result in destruction of the heating element due to higher pressure than the operating pressure.

If the central heating system is fitted with a pump that is independent of the boiler, then it must be stopped. Otherwise, there is a danger that the heating unit will be siphoned if the joins are not perfectly tight.