SLOVENSKI STANDARD
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Ogrevala in konvektorji - 1. del: Tehniļne specifikacije in zahteve

Radiators and convectors - Part 1: Technical specifications and requirements

Radiatoren und Konvektoren - Teil 1: Technische Spezifikationen und Anforderungen

Radiateurs et convecteurs - Partie 1: Spécifications et exigences techniques

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English version

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Radiatoren und Konvektoren - Teil 1 : Technische Spezifikationen und Anforderungen

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CEN

European Committee for Standardization
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Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 130 "Space heating appliances without integral heat sources" of which the secretariat is held by UNI.

This European Standard shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by June 1996, and conflicting national standard shall be withdrawn at the latest by June 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

0 Introduction

This European Standard of radiators and convectors consists of the following parts:

- Part 1: Technical specifications and requirements
- Part 2: Testing and rating methods
- Part 3: Evaluation of conformity

1 Scope

This European Standard defines the technical specifications and requirements of radiators and convectors to be installed in central heating systems in residential buildings.

Radiators and convectors are components for installation in a permanent manner in construction works.

This European Standard covers radiators and convectors fed with water or steam at temperatures below 120 °C, supplied by a remote heat source.

This European Standard does not apply to independent heating appliances.

This European Standard also defines the additional common data that the manufacturer shall provide to the trade in order to ensure the correct application of the products.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies:

EN 442-2:1996	Radiators and convectors - Part 2: Testing and rating methods
EN 573-3	Wrought aluminium and aluminium alloys - Chemical composition and forms of products - Part 3: Chemical composition
EN 10130	Cold rolled low carbon steel flat products for cold forming; Technical delivery conditions
EN 10131	Cold rolled uncoated low carbon and high yield stength steel flat products for cold forming on dimensions shape
EN 45001	General criteria for the operation of testing laboratories

ISO 31-4:1978 Quantities and units - Part 4: Heat

ISO 185: 1988 Grey cast iron - Classification

ISO 2409:1992 Paints and varnishes - Cross-cut test

3 Definitions, symbols and units of measurement

See EN 442-2 : 1996.

4 Pretreatment and paint

The pretreatment and paint processes used, shall provide a protective coating to all external surfaces in contact with the air which is:

- to give protection against corrosion in normal storage and installation conditions (as demonstrated by absence of surface corrosion after 100 hours humidity test according to a relevant standard) [1)]

- resistant to minor impact damage as demonstrated by a 2 mm cross-hatch test with a single blade cutting tool manually operated according to ISO 2409:1992.

  The test result shall be within the first three steps (0-1-2) of Table 1 of ISO 2409:1992.

The paint shall emit no odour and no toxic fumes under normal operating conditions.

5 Dimensional tolerances, mechanical strength and stability of the heating appliance

The dimensional tolerances shall not be greater than those in the manufacturer's drawings. In any case they shall not be greater than those given in Table 2 of EN 442-2: 1996.

5.1. Material specification and wall thickness of wet heating surface

The following values for material thickness for steel radiators, tubular radiators and finned tube convectors shall be measured before pressing or fabrication. Wall thickness of cast-iron, cast aluminium or extruded aluminium radiators refer to the nominal drawing dimensions minus all admissible tolerances.

5.1.1 Steel radiators (radiators manufactured from steel sheet or coil)

The wet heating surface materials of steel radiators shall be low carbon steel sheet, which is free from scale or rust and which complies with EN 10130 grade Fe PO1 and with EN 10131.

The thickness of the steel used for wet surfaces shall not be less than 1,11 mm .

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1) For example BS 3900 F2 or equivalent standard.

The compliance with this requirement shall be verified by measuring.

5.1.2 Cast-iron radiators

Cast-iron radiators shall be manufactured from grey cast-iron complying with ISO 185.

The wet wall thickness shall not be less than 2,5 mm.

The manufacturer shall ensure the minimum wall thickness by periodic controls of the casting equipment and daily random production checks.

Compliance with this requirement shall be verified by measurement.

5.1.3 Cast aluminium radiators

Cast aluminium alloy radiators shall be manufactured from alloy AlSi9Cu [2)] - (N. 46000 and N. 46001).

The wet wall thickness shall not be less than 1,5 mm.

The manufacturer shall ensure the minimum wall thickness by periodic controls of the casting equipment and daily random production checks.

Compliance with this requirement shall be verified by measurement.

5.1.4 Extruded aluminium radiators

Extruded aluminium alloy radiators shall be manufactured from wrought aluminium alloy EN AW-6060 of the EN 573-3 corresponding to the alloy AlMgSi.

The wet wall thickness shall not be less than 1,1 mm.

The manufacturer shall ensure the minimum wall thickness by periodic controls of the extruder and daily random production checks.

Compliance with this requirement shall be verified by measurement..

5.1.5 Tubular radiators

The material specification and gauge of tubes used in manufacture will be dependent on the tube size and profile and on the process of assembly.

They shall nevertheless be sufficient to satisfy the general minimum requirements of 5.2 and 5.3 and the wall thickness of the tube used shall not be less than 0,8 mm.

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2) A standard "Aluminium and aluminium alloys - Alloy ingots" is under preparation by CEN/TC 132/WG1 with reference 130-12.

Compliance with this requirement shall be verified by measurement.

5.1.6 Finned tube convectors

The wall thickness of the tube shall not be less than 0,8 mm .

Compliance with this requirement shall be verified by measurement.

5.1.7 Other materials

Materials (grade and thickness) other than those specified in 5.1.1 to 5.1.6 may be used provided that they have been demonstrated by appropriate tests and/or data to:

- meet the requirements of 5.2 and 5.3;

- ensure at least equivalent performance in terms of strength and stability of the product.

Compliance with this requirement shall be verified by measurement.

5.2 Leak testing

All heating appliances before leaving the manufacturer's works shall be tested for leaks to a test pressure equal to at least 1,3 times the quoted maximum operating pressure. The test pressure shall not be less than 520 kPa.

5.3 Strength pressure testing

Sample heating appliances shall be subjected to a burst test at a pressure 1,3 times the leak testing pressure, as specified in 5.2.

- The sample under test may deform but shall not rupture.

- The sample radiators shall not be less than 500 mm long. They shall not be sold after testing.

5.4 Surface defects

The heating appliance shall be free from burrs likely to cause personal injury.

6 Thermal output

6.1 Test method and laboratory

The thermal output shall be determined with the test methods and test programme specified by EN 442-2: 1996 in a laboratory complying with EN 45001 also taking into account th laboratory specific requirements and harmonisation methods as specified by EN 442-2: 1996.

6.2 Aim of the test programme

The aim of the test programme is to determine:

- The standard thermal output for comparison of different products;
- The thermal output in different operating conditions to provide standardised technical data for the design of heating systems.

6.3 Test data

The test programme shall determine:

- the standard characteristic equation of the model or of each model of a type;
- the standard characteristic equation of the type;
- the standard thermal output of all the models of the type;
- the weight and water content of all the models of the type.

6.4 Test report

The test report shall be issued according to clause 7 of EN 442-2: 1996.

6.5 Dimensional control by the manufacturer

The manufacturer shall implement a quality control system to ensure that products comply with the tolerances given in Table 2 of EN 442-2:1996.

7 Catalogue data

7.1 General

This clause of this European Standard specifies the mimimum data that the manufacturer or sales agent shall give in his catalogues for the evaluation, installation and identification of the relevant heating appliance.

7.2 Identification code of the heating appliance

The data shall refer to the identification code of the model or of the type of heating appliance. This identification code shall be the same as that used for marking the packaging of the heating appliance (see clause 8).

7.3 Thermal output

For all the models in a type, the standard thermal output (ΔT= 50 K) and the exponent of the excess temperature shall be indicated.