SLOVENSKI STANDARD
SIST EN 14037-3:2004

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Stropne sevalne plošče za vodo pri temperaturi pod 120 °C - 3. del: Metoda vrednotenja in ocena sevalne toplotne oddaje

Ceiling mounted radiant panels supplied with water at temperature below 120 °C - Part 3: Rating method and evaluation of radiant thermal output

Deckenstrahlplatten für Wasser mit einer Temperatur unter 120 °C - Teil 3: Wärmetechnische Umrechnungen, Bewertungsmethoden und Festlegung der Strahlungs -Wärmeleistung

Panneaux rayonnants de plafond alimentés en eau a une température inférieure a 120 °C - Partie 3 : Méthode d'évaluation et calcul de la puissance thermique radiative

Ta slovenski standard je istoveten z: **EN 14037-3:2003**

ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems

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English version

Ceiling mounted radiant panels supplied with water at temperature below 120 °C - Part 3: Rating method and evaluation of radiant thermal output

Panneaux rayonnants de plafond alimentés en eau à une température inférieure à 120 °C - Partie 3: Méthode de conversion de la puissance thermique et évaluation de la puissance radiative

Deckenstrahlplatten für Wasser mit einer Temperatur unter 120 °C - Teil 3: Wärmetechnische Umrechnungen, Bewertungsmethoden und Festlegung der Strahlungs-Wärmeleistung

This European Standard was approved by CEN on 20 February 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document EN 14037-3:2003 has been prepared by Technical Committee CEN /TC 130, "Space heating appliances without integral heat sources", the secretariat of which 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 October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

Annex A is normative.

This document includes a Bibliography.

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

Introduction

This European standard results from the recognition that the ceiling mounted radiant panels falling into the field of application hereinafter stated, are traded on the basis of their thermal output. To evaluate and compare different ceiling mounted radiant panels it is therefore necessary to refer to a single stipulated value.

This European Standard of ceiling mounted radiant panels consists of the following parts:

— Part 1: Technical specifications and requirements

— Part 2: Test method for thermal output

— Part 3: Rating method and evaluation of radiant thermal output

1 Scope

This European Standard describes the procedure to determine the rated thermal output (Φ_D) and the mean surface temperature (t_{rp}).

Ceiling mounted radiant panels exchange heat mainly by radiation.

The test methods for determining the thermal output of ceiling mounted radiant panels, as described in the part 2 of this European Standard, give reliable results for comparing different products, but these results understate the output obtained under real operating conditions.

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 (including amendments).

EN 14037-1:2003, *Ceiling mounted radiant panels supplied with water at temperature below 120 °C - Part 1: Technical specifications and requirements.*

EN 14037-2:2003, *Ceiling mounted radiant panels supplied with water at temperature below 120 °C - Part 2: Test method for thermal output.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 14037-1:2003 apply.

4 Testing of the mean surface temperature and the emissivity of the panel

4.1 Testing the mean surface temperature

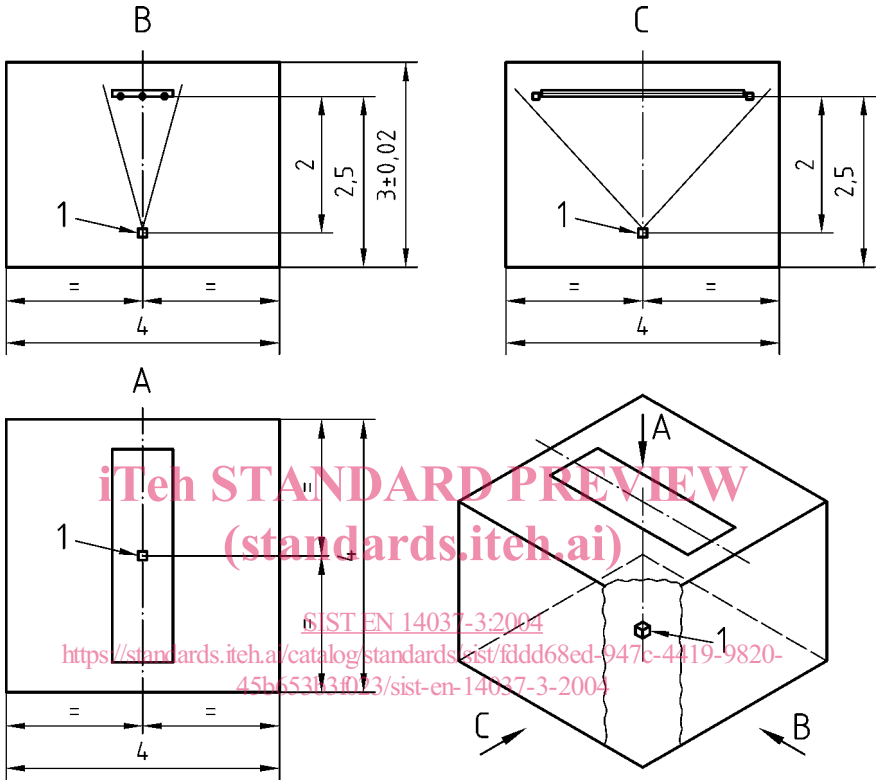
The mean surface temperature shall be determined by an Infra-Red (IR) system with the following features: automatic mean temperature of the measured surface including the emissivity, the distance and the ambient temperature.

The test is made in the same test booth and under the same test conditions described in clauses 5, 7 and 8 of EN 14037-2:2003. While testing the mean surface temperature, the connecting components shall be insulated.

The mean surface temperature shall be determined with the IR system for each testing point according to 8.9 of EN 14037-2:2003.

The IR system shall be installed with the sensitive probe directed towards the central vertical axis of the ceiling mounted radiant panel (see Figure 1).

Dimensions in millimetres



Key

1 IR system
A Top view
B Side view over the width of the ceiling panel
C Side view over the length of the ceiling panel

Figure 1 — Arrangement of the IR system and the ceiling panel in the test booth during determination with only one testing point

The distance between the surface of the ceiling mounted radiant panel and the sensor shall be two meters.

The field of view shall be not less than 80° over the length and not less than 60° over the width of the panel.

The tolerance of mean surface temperature shall be not more than 1,0 K.

The results of the determination of the radiant output shall be reported in accordance with requirements in annex A.

4.2 Determination of the emissivity

The determination of the emissivity shall be carried out with samples of the original sheet covered with the surface coating used at production.

The test shall be done by an approved laboratory which has to record the results in a test report.

5 Thermal output conversion – Determination of the rated thermal output

Practical experiments and simulation exercises indicate that test booth results understate output from radiant ceiling mounted panels by a factor of about 10 % [see Bibliography [1] to [10]. In order to ensure that designers are able to use test data for correct sizing of products a correction factor is applied to test data to give rated thermal output Φ_D.

The factor of 1,1 shall be introduced in the characteristic equation determined according to 8.12 of EN 14037-2:2003. The rated thermal output shall be taken from this curve in correspondence of standard excess temperature.

6 Evaluation of the thermal radiant output of a tested panel

The radiant output of the tested panel can be calculated for each measuring point as follows:

$$\Phi_{rad} = \sigma \cdot \varepsilon_{rp} \cdot \left(T_{rp}^4 - T_w^4\right) \cdot A_{rp}$$

The referred percentage of radiant output is calculated for each measuring point as follows:

$$r = \frac{\Phi_{rad}}{\Phi_{act}} \cdot 100$$

Annex A
(normative)

Determination of the surface temperature - Test report

The test is carried out in connection with the performance test in EN 14037-3.

The test report shall contain the following information:

Test report No.:_____

Date:_____

Test laboratory: .....

The test report contains .....pages and may only be copied in unshortened version.

Customer: .....

Address of customer: .....

Manufacturer: .....

Address of manufacturer: .....

Type name / manufacturer's name of the test sample.....

Test according to European Standard EN 14037-3

(Note: Indications for test stand, test sample and documents of manufacturer are contained in test report No. ..... according to EN 14037-2)

Description of the IR system and indication of the actual number of testing points:.....

Test result:

	Unit	Testing points		
		1	2	*3*
Excess temperature	K			
Inlet water temperature	°C			
Outlet water temperature	°C			
Mean water temperature	°C			
Mean surface temperature	°C			

Signatures of Test Engineer and the Laboratory Director