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**Stropne sevalne plošče za ogrevanje in hlajenje površin za vodo s temperaturo pod 120° C - 2. del: Preskusna metoda toplotne moči stropnih sevalnih plošč**

Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 2: Test method for thermal output of ceiling mounted radiant panels

An der Decke frei abgehängte Heiz- und Kühlflächen für Wasser mit einer Temperatur unter 120°C - Teil 2: Prüfverfahren für die Wärmeleistung von Deckenstrahlplatten

Panneaux rayonnants de plafond alimentés en eau à une température inférieure à 120°C - Partie 2: Méthodes d'essai pour la détermination de la puissance thermique

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**Ta slovenski standard je istoveten z: prEN 14037-2**

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**ICS:**

91.140.10	Sistemi centralnega ogrevanja	Central heating systems
91.140.65	Oprema za ogrevanje vode	Water heating equipment

**oSIST prEN 14037-2:2012****en,fr,de**

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EUROPEAN STANDARD  
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**DRAFT**  
**prEN 14037-2**

November 2011

ICS 91.140.10

Will supersede EN 14037-2:2003

English Version

## Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 2: Test method for thermal output of ceiling mounted radiant panels

Panneaux rayonnants de chauffage et de rafraîchissement alimentés avec une eau à une température inférieure à 120 °C - Partie 2: Méthodes d'essai pour la détermination de la puissance thermique des panneaux rayonnants de plafond

An der Decke frei abgehängte Heiz- und Kühlflächen für Wasser mit einer Temperatur unter 120 °C - Teil 2: Prüfverfahren für die Wärmeleistung von Deckenstrahlplatten

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 130.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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## Foreword

This document (prEN 14037-2:2011) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 14037-2:2003.

The main changes are:

- the title has been changed,
- a new Master panel 2 has been added,
- the chapter 9 "Test Report" has been reworked.

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## Introduction

This European Standard results from the recognition that the ceiling mounted heating and cooling surfaces falling into the field of application hereinafter stated are traded on the basis of their thermal and cooling output. For evaluating and comparing different ceiling mounted radiant panels it is therefore necessary to refer to a single stipulated value.

The European Standard EN 14037, Free hanging heating and cooling surfaces for water with a temperature below 120°C consists of the following parts:

- Part 1: Technical specifications and requirements
- Part 2: Test method for thermal output of ceiling mounted radiant panels
- Part 3: Rating method and evaluation of radiant thermal output of ceiling mounted radiant panels
- Part 4: Test method for cooling capacity of ceiling mounted radiant panels
- Part 5: Test method for thermal output of open or closed heated ceiling surfaces

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### 1 Scope

This European Standard describes the test method and the test installation for determining the thermal output of ceiling mounted radiant panels according to the specifications of prEN 14037-1, clause 3.3.1..

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 442-2, *Radiators and convectors – Part 2: Test methods and rating*

prEN 14037-1, *Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 1: Technical specifications and requirements*

prEN 14037-3, *Free hanging heating and cooling surfaces for water with a temperature below 120°C – Part 3: Rating method and evaluation of radiant thermal output of ceiling mounted radiant panels*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*

### 3 Terms and definitions

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

### 4 Testing of thermal output

The test is carried out in a testing system, which consists of a closed booth with controlled temperatures of the inside surfaces plus a set of two master panels built according to clause 6.

**prEN 14037-2:2011 (E)**

The method for measuring the thermal output consists of the measurement of mass flow and enthalpy difference between inlet and outlet (by weighing method). Other measurement methods shall guarantee in minimum the precision obtained by weighing method.

All laboratories that make tests according this standard have to make comparable measurements with the other laboratories (according to clause 6 of this standard).

**5 Test booth**

The booth for testing ceiling mounted radiant panels shall be constructed in a way that all six surrounding surfaces can be chilled.

Figure 1 shows the schematic lay-out of a test booth with a six-wall cooling. The walls are defined as follows:

Wall 1: the wall parallel to the inlet header

Wall 2: the wall to the right of wall 1

Wall 3: the wall opposite of wall 1

Wall 4: the wall to the left of wall 1

Wall 5: the floor

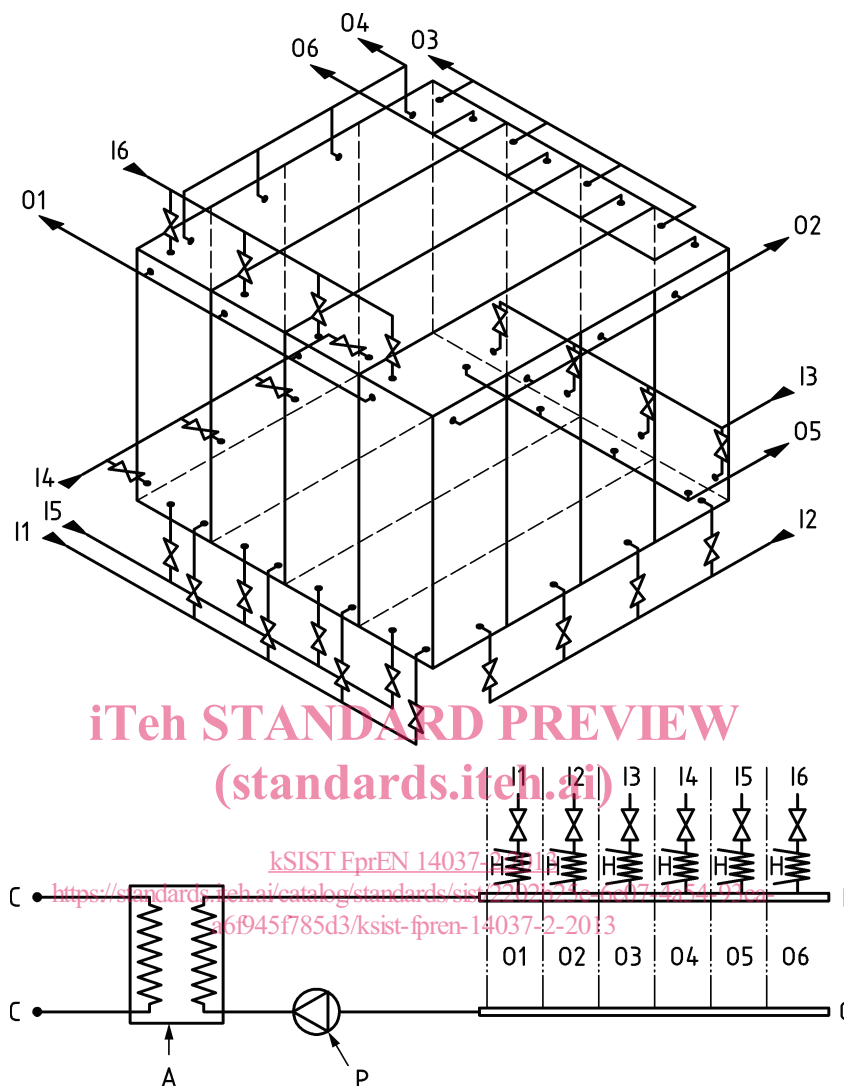
Wall 6: the ceiling

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**Key**

- C Cooling circuit connection
- I Inlet cooling water
- O Outlet cooling water
- A Cooling water accumulator
- P Circulating pump
- H After heater
- 1...6 Designation of the surrounding inside surfaces

**Figure 1 — Example of the hydraulic system of a test booth**

### 5.1 Dimensions of the test booth

The test booth has to have the following inside dimensions:

Length:  $(4 \pm 0,02)$  m

Width:  $(4 \pm 0,02)$  m

Height:  $(3 \pm 0,02)$  m

## prEN 14037-2:2011 (E)

## 5.2 Emissivity of the inside surrounding surfaces

Walls, ceiling and floor shall have smooth inside surfaces covered with a coat of mat paint having a degree of emissivity of minimum 0,9.

## 5.3 Tightness of the test booth

The test booth construction shall be sufficiently tight to prevent air infiltration.

## 5.4 Cooling system

The cooling system is to be carried out in order, that the difference between the 6 chilled surrounding inside surfaces of the test booth and the average temperature of all 6 surfaces is not higher than 0,5 K. The temperature difference between inlet and outlet shall not be higher then 0,5 K. That condition shall be maintained at the tests for the determination of the characteristic equation.

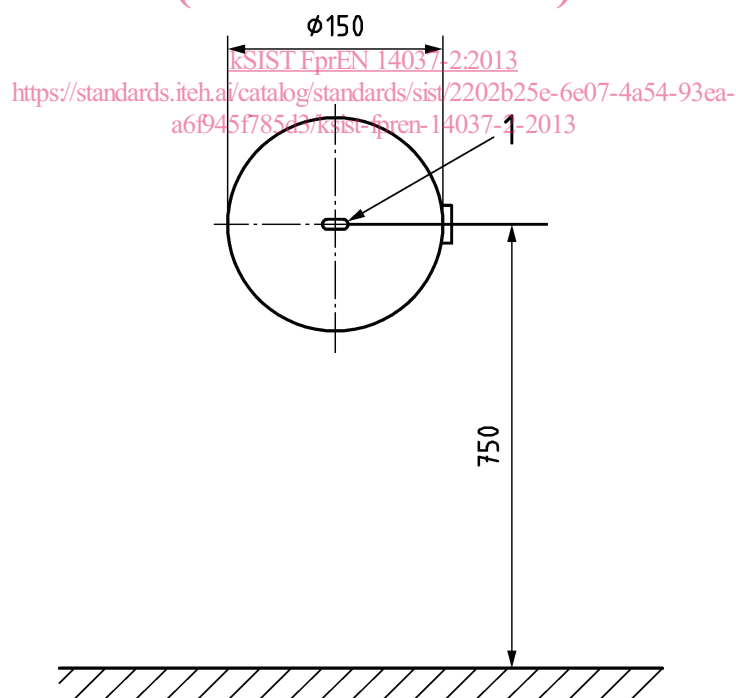
## 5.5 Temperature measuring points

### 5.5.1 Reference room temperature

The reference room temperature is measured on at a height of 0,75 m above the floor of the test booth by means of a globe thermometer (see Figure 2). The measuring point is situated on the vertical axis through the central point of the ceiling mounted radiant panel.

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Dimensions in millimetres



### Key

1 Temperature measuring point

**Figure 2 — Globe thermometer**

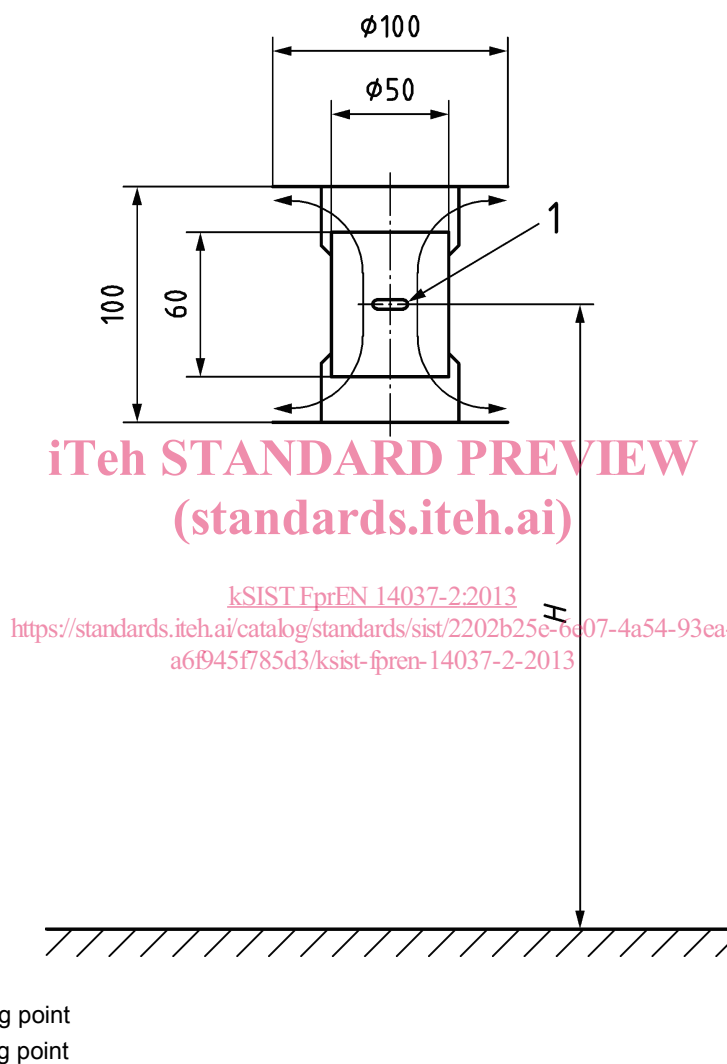
Temperature sensor with blackened light metal sphere (diameter 150 mm, emissivity 0,9). The measuring point is arranged in the centre of the sphere. The penetration of the temperature sensor through the surface of the sphere runs horizontally and is air tight. The hollow sphere is attached to the temperature sensor.

### 5.5.2 Air temperature

The air temperature is measured with sensors protected against radiation (see Figure 3).

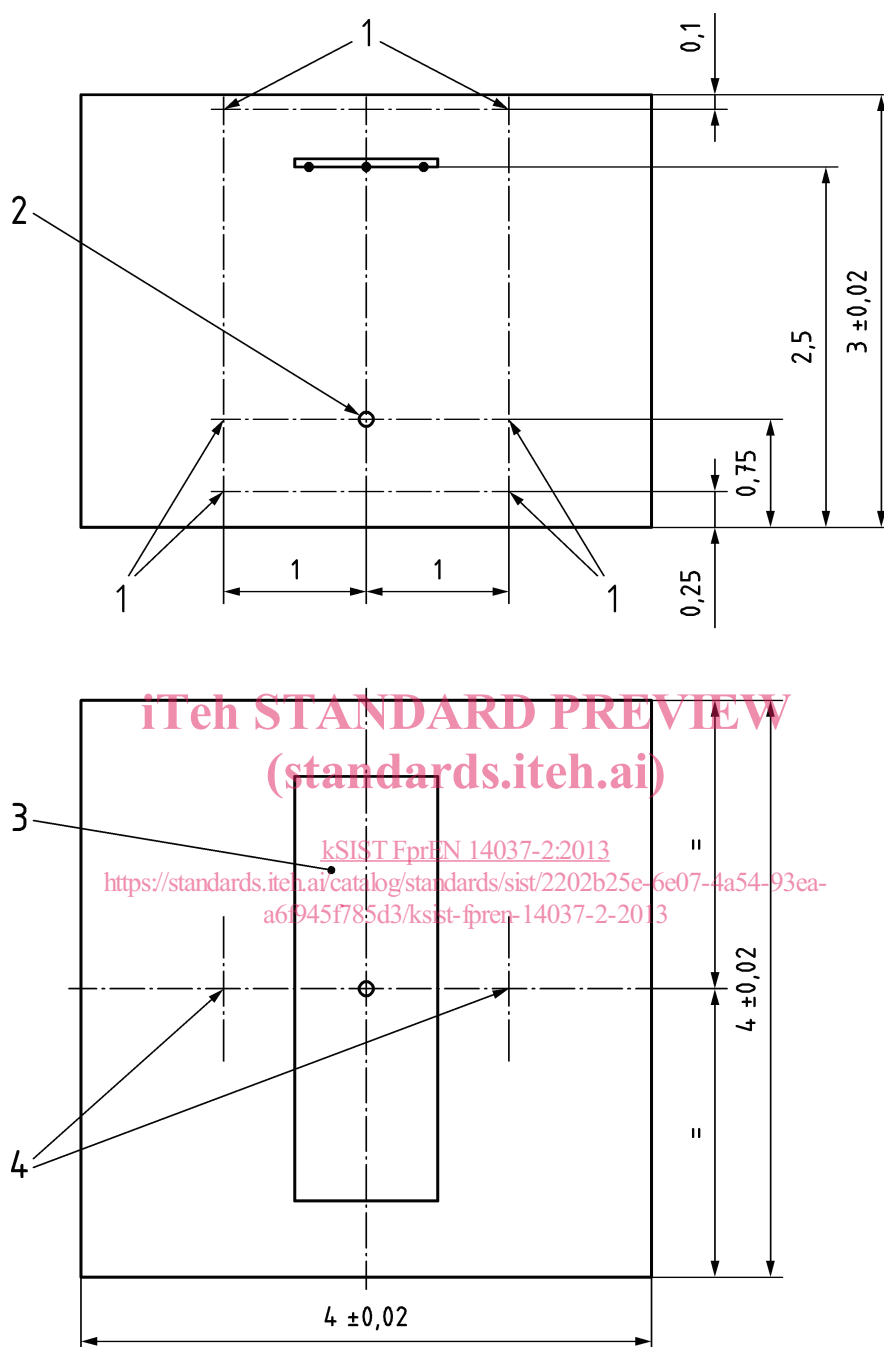
The measuring points are situated on 2 vertical axes at 3 different heights as shown in Figure 4.

Dimensions in millimetres



**Figure 3 — Example of a measuring point protected against radiation**

Dimensions in millimetres

**Key**

- 1 Air temperature measuring points
- 2 Reference room temperature measuring point
- 3 Ceiling mounted radiant panel
- 4 Axes of air temperature measuring points

**Figure 4 — Arrangement of measuring points for the reference room temperature and for air temperature**

### 5.5.3 Surface temperature of the inside surfaces

The surface temperatures of the inside walls is calculated as average value of the inlet and outlet water temperature of each single surface wall.