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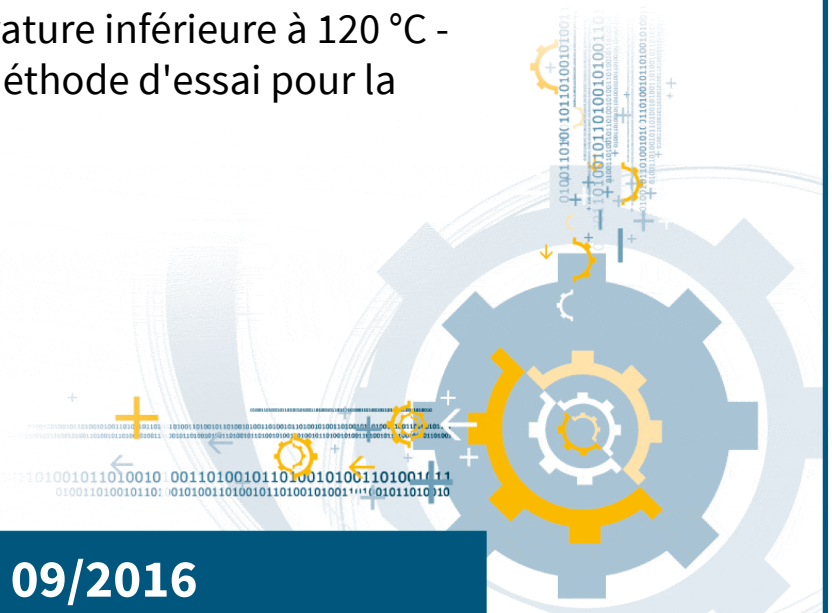
## ILNAS-EN 14037-5:2016

### **Free hanging heating and cooling surfaces for water with a temperature below 120°C - Part 5: Open or closed heated ceiling surfaces - Test method**

An der Decke frei abgehängte Heiz- und  
Kühlflächen für Wasser mit einer  
Temperatur unter 120 °C - Teil 5: Offene  
oder geschlossene Deckenheizflächen -

Panneaux rayonnants de chauffage et de  
rafraîchissement alimentés avec une eau  
à une température inférieure à 120 °C -  
Partie 5: Méthode d'essai pour la

09/2016



## National Foreword

This European Standard EN 14037-5:2016 was adopted as Luxembourgish Standard ILNAS-EN 14037-5:2016.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

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ILNAS-EN 14037-5:2016

EUROPEAN STANDARD **EN 14037-5**

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2016

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English Version

**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**

Panneaux rayonnants de chauffage et de  
rafraîchissement alimentés avec une eau à une  
température inférieure à 120 °C - Partie 5 : Méthode  
d'essai pour la détermination de la puissance  
thermique des surfaces de plafond de chauffage  
ouverts ou fermés

An der Decke frei abgehängte Heiz- und Kühlflächen  
für Wasser mit einer Temperatur unter 120 °C - Teil 5:  
Prüfverfahren für die Wärmeleistung von offenen oder  
geschlossenen Deckenheizflächen

This European Standard was approved by CEN on 18 March 2016.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## Contents

Page

European foreword.....	3
Introduction .....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 Symbols and units .....	6
5 Testing of thermal output .....	7
6 Test methods .....	9
7 Carrying out the measurement.....	9
7.1 General.....	9
7.2 Test design.....	9
7.3 Connection of the test sample to the measuring circuit.....	9
7.4 Mass flow.....	9
7.5 Test temperature .....	10
7.6 Reference room temperature .....	10
7.7 Steady-state conditions.....	10
7.8 Heat output.....	10
7.9 Result of measurement – characteristic equation .....	10
7.10 Standard output.....	11
7.11 Interpolation of values of the thermal output.....	11
8 Upper insulation.....	11
9 Test report.....	11
9.1 General.....	11
9.2 Data .....	11
10 Examples for the determination of the active length of different ceiling mounted heating surfaces.....	13
Annex A (informative) Specimen of the test report for heating capacity .....	18
Bibliography.....	21

## European foreword

This document (EN 14037-5:2016) 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 March 2017, and conflicting national standards shall be withdrawn at the latest by March 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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: Pre-fabricated ceiling mounted radiant panels for space heating - Technical specifications and requirements*
- *Part 2: Pre-fabricated ceiling mounted radiant panels for space heating - Test method for thermal output*
- *Part 3: Pre-fabricated ceiling mounted radiant panels for space heating - Rating method and evaluation of radiant thermal output*
- *Part 4: Pre-fabricated ceiling mounted radiant panels for space heating - Test method for cooling capacity*
- *Part 5: Open or closed heated ceiling surfaces - Test method for thermal output*

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

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

As installations with ceiling mounted radiant panels can also be used in practice for space cooling, it is necessary to have a test method for evaluating the cooling capacity. Installations with different free hanging heating and cooling surfaces need, for the use of space heating a test method for evaluating the heating output. The test method differs from the method for ceiling mounted radiant panels.

## 1 Scope

This European Standard describes the test method and the test installation for determining the thermal output of ceiling mounted heating surfaces according to the specifications 3.1, 3.2. and 3.3.

This part applies to determine thermal output when chilled ceilings according to EN 14240 are also used for heating.

NOTE Test results according to this part cannot be compared with results according EN 14037-2 because great discrepancies are given at open ceilings, convective components and heating surfaces without upper insulation.

## 2 Normative references

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

EN 14037-1:2016, *Pre-fabricated ceiling mounted radiant panels for space heating - Technical specifications and requirements*

EN 14037-2:2016, *Pre-fabricated ceiling mounted radiant panels for space heating - Test method for thermal output*

EN ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14037-1:2016 and the following apply.

### 3.1

#### **open or closed ceiling surface**

open or closed active and non-active elements of chilled ceilings, which are additionally used for heating, which are part of suspended ceilings and generally constructed modular from industrially prefabricated elements

### 3.2

#### **free hanging sail**

surface composed of one or more elements of a cooling installation which is additionally used for heating

Note 1 to entry: Depending on the use of the sails they can be covered with thermal insulation or noise absorption material.

### 3.3

#### **suspended ceiling with integrated heating elements**

single closed elements which are used for heating and are thermally insulated on the upper side, integrated in closed hanging ceilings and combined with non-active elements

### 3.4

#### **mean radiant temperature**

temperature in a defined point of the room resulting from the radiation of all surrounding surfaces and of the heated ceiling surface

**3.5**  
**standard temperature difference of heated ceiling surfaces**  
 mean water temperature 35°C and reference room temperature 20°C, determined temperature difference 15 K

**3.6**  
**active heated ceiling surface**  
 relating to thermal output of heated ceiling surfaces

**3.7**  
**module**  
 1 m<sup>2</sup> active surface of a heated ceiling surface

## 4 Symbols and units

For the purposes of this document, the symbols and units given in EN 14037-1:2016 and the following apply.

**Table 1 — Symbols and units**

No.	Quantity	Symbol	Unit
1	Installation surface	$A_i$	m <sup>2</sup>
2	Active surface	$A_a$	m <sup>2</sup>
3	Total active surface	$A_{\text{atot}}$	m <sup>2</sup>
4	Constant of the characteristic equation of the active surface	$K_{\text{act}}$	W/K <sup>n<sub>act</sub></sup>
5	Constant of the characteristic equation of the module	$K_{\text{actM}}$	W/(m <sup>2</sup> K <sup>n<sub>act</sub></sup> )
6	Constant of the characteristic equation of the installation surface	$K_{\text{tot}}$	W/K <sup>n<sub>tot</sub></sup>
7	Exponent of the characteristic equation of the active surface	$n_{\text{act}}$	-
8	Exponent of the characteristic equation of the installation surface	$n_{\text{tot}}$	-
9	Active area ratio	$R_a$	-
10	Modular thermal output	$\Phi_L$	W/m <sup>2</sup>
11	Standard modular thermal output <sup>a</sup>	$\Phi_{Ls}$	W/m <sup>2</sup>
12	Standard temperature difference of a heated cooling surface when heating (15 K) <sup>a</sup>	$\Delta T_s$	K
a "s" indicates that the value is in standard conditions.			