



**SLOVENSKI STANDARD**  
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del: Varnost**

Non-domestic gas-fired overhead luminous radiant heaters - Part 1: Safety

Gasgeräte-Heizstrahler Hellstrahler mit Brenner ohne Gebläse für gewerbliche und industrielle Anwendung - Teil 1: Sicherheit

Appareils surélevés de chauffage à rayonnement lumineux au gaz, à usage non domestique - Partie 1: Sécurité  
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**Non-domestic gas-fired overhead luminous radiant heaters -  
Part 1: Safety**

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Gebläse für gewerbliche und industrielle Anwendung - Teil  
1: Sicherheit

This European Standard was approved by CEN on 9 May 1998.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 180 "Non-domestic gas-fired overhead radiant heaters", the secretariat of which is held BSI.

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of an identical text or by endorsement, at the latest by February 2000, and conflicting national standards shall be withdrawn at the latest by February 2000.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

Test methods for rational use of energy are dealt with in European pre-standards ENV 1259-1, ENV 1259-2 and ENV 1259-3.

The test gases, test pressures and appliance categories given in this European Standard are in accordance with those specified in EN 437:1993 "Test gases — Test pressures — Appliance categories".

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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## 1 Scope

This European Standard specifies the requirements and test methods for the construction, safety, classification and marking of non-domestic gas-fired overhead luminous radiant heaters for environmental comfort, incorporating an atmospheric burner system referred to in the body of the text as “appliances”.

This European Standard is applicable to Type A<sub>1</sub> and Type B<sub>11</sub> appliances only (see 4.3).

This European Standard is not applicable to:

- appliances designed for use in domestic dwellings;
- outdoor appliances;
- appliances of heat input in excess of 120 kW (based on the net calorific value of the appropriate reference gas);
- appliances having fully pre-mixed gas and air burners in which :
  - either the gas and all the combustion air are brought together just before the level of the combustion zone;
  - or the pre-mixing of the gas and all combustion air is carried out in a part of the burner upstream of the combustion zone.
- appliances in which the supply of combustion air and/or the removal of the products of combustion is achieved by integral mechanical means.

This standard is applicable to appliances which are intended to be type tested. Requirements for appliances which are not intended to be type tested would need to be subject to further consideration.

Requirements concerning the rational use of energy have not been included in this European Standard.

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## 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 88: 1991	<i>Pressure governors for gas appliances for inlet pressures up to 200 mbar.</i>
EN 125: 1995	<i>Flame supervision devices for gas burning appliances - Thermo-electric flame supervision devices.</i>
EN 126: 1995	<i>Multifunctional controls for gas burning appliances.</i>
EN 161: 1991	<i>Automatic shut-off valves for gas burners and gas appliances.</i>
EN 257: 1992	<i>Mechanical thermostats for gas burning appliances.</i>
EN 298: 1993	<i>Automatic gas burner control systems for gas burners and gas burning appliances with or without fans.</i>
EN 437: 1993	<i>Test gases - Test pressures - Appliance categories.</i>
EN 23166: 1993	<i>Specification for codes for the representation of names of countries. (ISO 3166: 1993)</i>
EN 60335-1: 1988	<i>Safety of household and similar electrical appliances. Part 1: General requirements.</i>
EN 60529:1991	<i>Degrees of protection provided by enclosures (IP Code).</i>
EN 60730-1: 1995	<i>Automatic electrical controls for household and similar general purposes. Part 1: General requirements.</i>
EN 61058-1: 1992	<i>Switches for appliances. Part 1: General requirements.</i>
ISO 7-1: 1994	<i>Pipe threads where pressure-tight joints are not made on the threads. Part 1: Designation, dimensions and tolerances.</i>
ISO 228-1: 1994	<i>Pipe threads where pressure-tight joints are not made on the threads. Part 1: Designation, dimensions and tolerances.</i>
ISO 274: 1975	<i>Copper tubes of circular section - Dimensions.</i>
ISO 6976: 1995	<i>Natural gas - calculation of calorific values, density, relative density and Wobbe index from composition.</i>



prEN 50165: 1995	<i>Electrical equipment of non-electrical heating appliances for household and similar purposes. Safety requirements</i>
IEC 479	<i>Effects of current on human beings and livestock.</i>
IEC 479-1: 1994	<i>Part 1: General aspects.</i>
IEC 479-2: 1987	<i>Part 2: Special aspects.</i>

### 3 Definitions

For the purposes of this standard the following definitions apply:

#### 3.1 Appliance and its constituent parts

##### 3.1.1

##### ***overhead luminous radiant heater***

a gas-fired appliance intended for installation at a height above head level and which is designed to heat the space beneath by radiation and in which the heat is produced by means of burning the fuel at or near the outer surface of a material such as a ceramic plaque or gauze, or by means of an atmospheric burner heating a gauze or similar material

##### 3.1.2

##### ***atmospheric burner***

an aerated burner in which the air for combustion is entrained at atmospheric pressure

##### 3.1.3

##### ***inlet connection***

the part of the appliance intended to be connected to the gas supply

##### 3.1.4

##### ***mechanical joint***

a means of ensuring the soundness of an assembly of several (generally metallic) parts without the use of liquids, pastes, tapes, etc.

NOTE For example the following:

- metal to metal joints;
- conical joints;
- toroidal sealing rings (“O” rings);
- flat joints.

### 3.1.5

#### ***gas circuit***

the part of the appliance that conveys or contains the gas between the appliance gas inlet connection and the burner(s)

### 3.1.6

#### ***restrictor***

a device with an orifice, which is placed in the gas circuit so as to create a pressure drop and thus reduce the gas pressure at the burner to a predetermined value for a given supply pressure and rate

### 3.1.7

#### ***gas rate adjuster***

a component allowing an authorised person to set the gas rate of the burner to a predetermined value according to the supply conditions

NOTE Adjustment can be progressive (screw adjuster) or in discrete steps (by changing restrictors).

The adjusting screw of an adjustable governor is regarded as a gas rate adjuster.

The action of adjusting this device is called “adjusting the gas rate”.

A factory sealed gas rate adjuster is considered to be non-existent.

### 3.1.8

#### ***setting an adjuster***

immobilizing a gas rate adjuster by such means as a screw, etc., after the gas rate has been adjusted by the manufacturer or installer

### 3.1.9

#### ***sealing an adjuster***

the term applied to any arrangement in respect of the adjuster such that any attempt to change the adjustment breaks the sealing device or sealing material and makes this interference apparent

NOTE A factory sealed adjuster is considered to be non-existent.

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A governor is considered to be non-existent if it has been factory sealed in a position such that it is not operational in the range of supply pressure corresponding to the appliance category.

### 3.1.10

#### ***putting an adjuster or a control out of service***

an adjuster or a control (of temperature, pressure, etc.) is said to be “put out of service” if it is put out of action and sealed in this position. The appliance then functions as if this device had been removed

### 3.1.11

#### ***injector***

a component that admits the gas into a burner

### 3.1.12

#### ***main burner***

a burner that is intended to ensure the thermal function of the appliance and is generally called "the burner"

### 3.1.13

#### ***ignition burner***

a burner whose flame is intended to ignite another burner

### 3.1.14

#### ***ignition device***

a means (flame, electrical ignition device or other device) used to ignite the gas at the ignition burner or at the main burner

### 3.1.15

#### ***primary aeration adjuster***

a device enabling the primary air to be set at the necessary value according to the supply conditions

## 3.2 Combustion products circuit

### 3.2.1

#### ***flue outlet***

the part of a Type B<sub>11</sub> appliance that connects with a flue to evacuate the products of combustion

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### 3.2.2

#### ***draught diverter***

a device placed in the combustion products circuit to reduce the influence of flue pull and that of down-draught on the burner performance and combustion

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## 3.3 Adjusting, control and safety devices

### 3.3.1

#### ***automatic burner control system***

a system comprising at least a programming unit and all the elements of a flame detector device

The various functions of an automatic burner control system may be in one or more housings.

### 3.3.2

#### ***programming unit***

a device which reacts to signals from control and safety devices, gives control commands, controls the start-up sequence, supervises the burner operation and causes controlled shut-down, and, if necessary, safety shut-down and lock-out. The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector

### 3.3.3

#### ***programme***

the sequence of control operations determined by the programming unit involving switching on, starting up, supervising and switching off the burner

### 3.3.4

#### ***flame detector***

a device by which the presence of a flame is detected and signalled

It can consist of a flame sensor, an amplifier and a relay for signal transmission. These parts, with the possible exception of the actual flame sensor, may be assembled in a single housing for use in conjunction with a programming unit

### 3.3.5

#### ***flame signal***

the signal given by the flame detector, normally when the flame sensor senses a flame

### 3.3.6

#### ***flame supervision device***

a device that, in response to a signal from the flame detector, keeps the gas supply open and shuts it off in the absence of the supervised flame

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### 3.3.7

#### ***flame simulation***

a condition which occurs when the flame signal indicates the presence of a flame when in reality no flame is present

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### 3.3.8

#### ***pressure governor***<sup>1)</sup>

a device which maintains the outlet pressure constant independent of the variations in inlet pressure within defined limits

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<sup>1)</sup> The term "govenor" is used in both cases

### 3.3.9

#### ***adjustable pressure governor***

a governor provided with means for changing the outlet pressure setting

### 3.3.10

#### ***volume governor***<sup>1)</sup>

a device which maintains the gas rate constant within a given tolerance, independent of the upstream pressure

### 3.3.11

#### ***automatic shut-off valve***

a valve designed to open when energized and to close automatically when de-energized

## 3.4 Operation of the appliance

### 3.4.1

#### ***heat input***

the quantity of energy used in unit time corresponding to the volumetric and mass flow rates, the calorific value to be used being the net or gross calorific value

Symbol:  $Q$

Unit: Kilowatt (kW) [EN 437:1993]

### 3.4.2

#### ***nominal heat input***

the value of the heat input declared by the manufacturer

Symbol:  $Q_n$

Unit: Kilowatt (kW) [EN 437:1993]

### 3.4.3

#### ***volumetric flow rate***

the volume of gas consumed by the appliance in unit time during continuous operation

Symbol:  $V$  <https://standards.iteh.ai/catalog/standards/sist/d41bab00-9cca-4fed-82c5-38a1b1a41f12/sist-en-419-1-1999>

Unit: Cubic metre per hour (m<sup>3</sup>/h). [EN 437: 1993]

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#### 3.4.4

##### ***mass flow rate***

the mass of gas consumed by the appliance in unit time during continuous operation

Symbol:  $M$

Unit: Kilogram per hour (kg/h), or gram per hour (g/h). [EN 437: 1993]

#### 3.4.5

##### ***start gas***

gas that is supplied at the start gas rate either at the main burner or at a separate ignition burner

#### 3.4.6

##### ***start gas rate***

the restricted gas flow rate admitted either to a separate ignition burner or to the main burner during start up

#### 3.4.7

##### ***start gas flame***

a flame established at the start gas rate either at the main burner or at a separate ignition burner

#### 3.4.8

##### ***flame stability***

the characteristic of flames which remain on the burner ports or in the flame reception zone intended by the construction

#### 3.4.9

##### ***flame lift***

the total or partial lifting of the base of the flame away from the burner port or the flame reception zone provided by the design

Flame lift may cause the flame to blow out, i.e. extinction of the air-gas mixture

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#### 3.4.10

##### ***light-back***

the entry of a flame into the body of the burner

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#### 3.4.11

##### ***light-back at the injector***

ignition of the gas at the injector, either as a result of light-back into the burner or by the propagation of the flame outside the burner

#### 3.4.12

##### *sooting*

a phenomenon appearing during incomplete combustion and characterized by deposits of soot on the surfaces or parts in contact with the combustion products or with the flame

#### 3.4.13

##### *first safety time*<sup>2)</sup>

the interval between the ignition burner valve, start gas valve or main gas valve, as applicable, being energized and the ignition burner valve, start gas valve or main gas valve, as applicable, being de-energized if the flame detector signals the absence of a flame at the end of this interval

#### 3.4.14

##### *second safety time*

where there is a first safety time applicable to either an ignition burner or to a start gas flame only, the second safety time is the interval between the main gas valve being energized and the main gas valve being de-energized if the flame detector signals the absence of a flame at the end of this interval

#### 3.4.15

##### *running condition of the system*

the condition in which the burner is in normal operation under the supervision of the programming unit and its flame detector

#### 3.4.16

##### *controlled shut-down*

the process by which the power to the automatic shut-off valve(s) is removed immediately as a result of the action of a controlling function

#### 3.4.17

##### *safety shut-down*

the process which is effected immediately following the response of a safety control or sensor or the detection of a fault in the burner control system and which puts the burner out of operation by immediately removing the power from the automatic shut-off valve(s) and the ignition device

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<sup>2)</sup> Where there is no second safety time, this is called the safety time.