SLOVENSKI STANDARD
SIST ENV 1259-2:1996

01-november-1996

Stropna cevna sevala s plinskim gorilnikom in plinska sevala z zgorevanjem na površini, ki se ne uporabljajo za ogrevanje stanovanj - 2. del: Zahteve in preskusne metode za zagotavljanje smotrne rabe energije - Sevalna metoda B

Single burner gas-fired overhead radiant tube heaters and non-domestic gas-fired overhead luminous radiant heaters - Part 2: Requirements and test methods for establishing the rational use of energy - Radiometric method B

Dunkelstrahler mit einem Brenner und kommerzielle Gasleucht-Deckenstrahlheizer - Teil 2: Anforderungen und Prüfverfahren zur Bestimmung der rationellen Verwendung von Energie - Radiometrisches Verfahren B

Tubes radiants suspendus a mono-bruleur au gaz et appareils surélevés de chauffage a rayonnement lumineux au gaz a usage non-domestique - Partie 2: Exigences et méthodes d'essais pour la détermination de l'utilisation rationnelle d'énergie - Méthode radiométrique B

Ta slovenski standard je istoveten z: **ENV 1259-2:1996**

ICS:

97.100.20 Plinski grelniki Gas heaters

SIST ENV 1259-2:1996 **en**

EUROPEAN PRESTANDARD

PRÉNORME EUROPÉENNE

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ENV 1259-2

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ICS 91.140.20

Descriptors: gas appliances, heaters, radiant tubes, radiation, measurements, radiometry, thermal efficiency, tests

English version

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This European Prestandard (ENV) was approved by CEN on 1996-08-31 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

CEN members are required to announce the existance of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

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

Other equivalent methods of efficiency determination are method A and method C by CEN/TC 180.

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

CONTENTS

Appendices

1 Scope

This ENV contains the requirements and test method B for the rational energy saving of radiant heaters and plaque heaters for commercial and industrial application described in the following text as 'heaters' with a defined radiant reference level, defined in paragraph 3.

2 Normative References

This European draft contains parts of other publications with or without chronological references. These standards are referred to by the corresponding passages and are listed at the end. Note that for chronological references, all additions or revisions of such publications are only applicable to this ENV, if they have been included in this ENV through addition or revision. For other references the last edition of a publication is also valid.

prEN 416-1:1990 Radiant heaters with a burner with fan for commercial and industrial application. Part 1: Safety requirements.

prEN 419-1:1990 Plaque heaters with a burner without fan for commercial and industrial application. Part 1: Safety requirements.

3 Definitions

For this standard the following special terms are valid:

3.1 Radiant Reference Plane

Definition of reference plane, flat horizontal surface bounded by the lower edge of the reflector (Sketch 1).

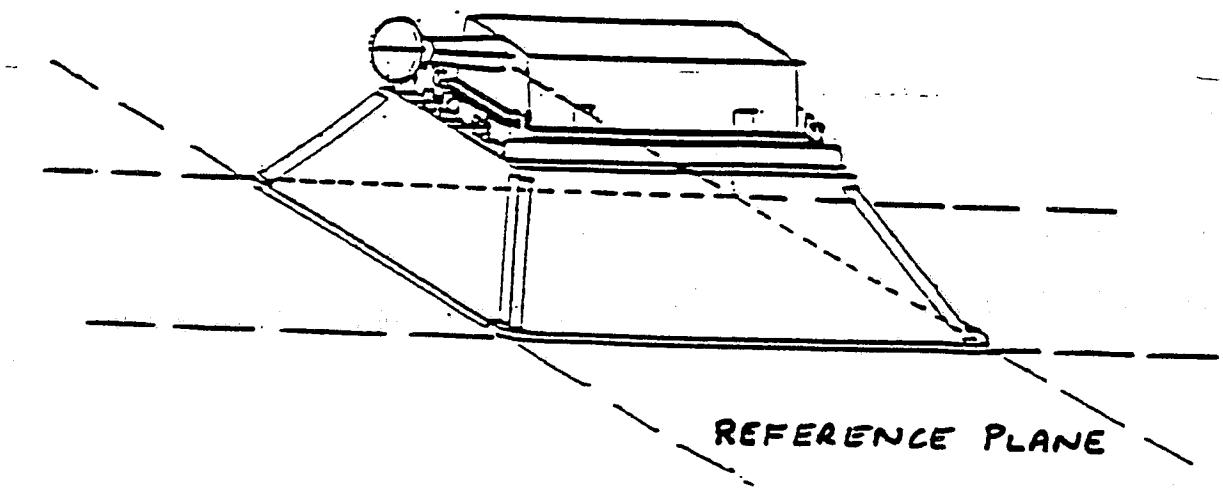


FIG 1: DEFINITION OF REFERENCE PLANE

If radiant surfaces protrude from this plane then the reference plane is replaced by a plane parallel but in front by the distance which the radiant surfaces protrude from the first named plane (Sketch 2).

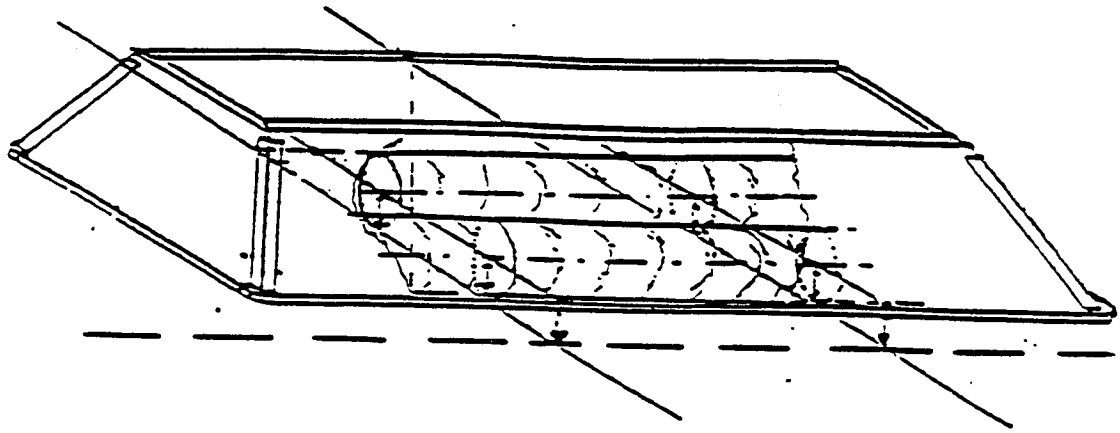


Fig 2: Transferred reference plane

3.2 Irradiance

The irradiance E_i measured in W/cm^2 is the quotient of the radiation flux incident on a surface from the half room and this surface.

3.3 Measuring Plane

The measuring plane is a parallel plane arranged at a distance of 10cm below reference plane.

3.4 Measuring Grid

The measuring grid is a regular arrangement imagined in the measuring plane of straight lines running parallel and perpendicular to the longitudinal axis of the radiant heater with sufficient precision (± 1mm). The nodal points of the measuring grid are at the points of intersection of these lines.

Recommendation: The first and last node points (measurement points) where the parallel and vertical lines intersect should be established before commencing the test. This is done by measuring the cos-corrected value of irradiation at the edge of the reflector. The crossover points or nodes are where irradiation is small than 1% of the maximum measured value under the heater (see Sketch 4). With plaque heaters a distance of 50mm has been shown to be sufficient.

4 Symbols

U	Sensor voltage
E_{ij}	Radiant intensity of heater measured on intersection of measurement grid (W/m^2)
$\bar{E}_{ij}$	Average irradiance intensity F_{ij} (W/m^2)
F_{ij}	Measurement grid area (m^2)
M_{ij}	Mean value of cos-corrected irradiation intensity (W/m^2)
H_i	Calorific value of test gas (kWh/m^3 at 15°C 1013mbar dry)
P	Gas connection pressure (mbar)
P_a	Atmospheric pressure (mbar)
QM	Measured heat input (kW)
QS	Radiant output (kW)
S	Sensitivity of radiometer $\left[\frac{W/m^2}{\mu V}\right]$
t_g	Temperature of gas at measuring point (°C)
V	Gas volume input at test conditions (m^3/h)
V_0	Gas flow (m^3/h volume input at 15°C 1013 mbar dry)
P_w	Steam saturation pressure of test gas at gas temperature t_g (mbar)
n_s	Net radiant efficiency of appliance (%)

5 Requirement for Rational Use of Energy

The heater manufacturer shall specify the radiant efficiency of the appliance in relation to the state of the art which shall be verified by the test according to clause 6.

NOTE: This procedure means that experiences can be collected before minimum requirements are set down in the planned European standard.

6 Test Method

6.1 Principle

NOTE: See also sections 4.1.1 up to and including 4.1.6.2 of prEN 416-1:1990 and prEN 419-1:1990, as appropriate.

6.2 Test Equipment

6.2.1 General Requirements for the Test Sensor

6.2.1.1 Characteristics of the Test Sensor

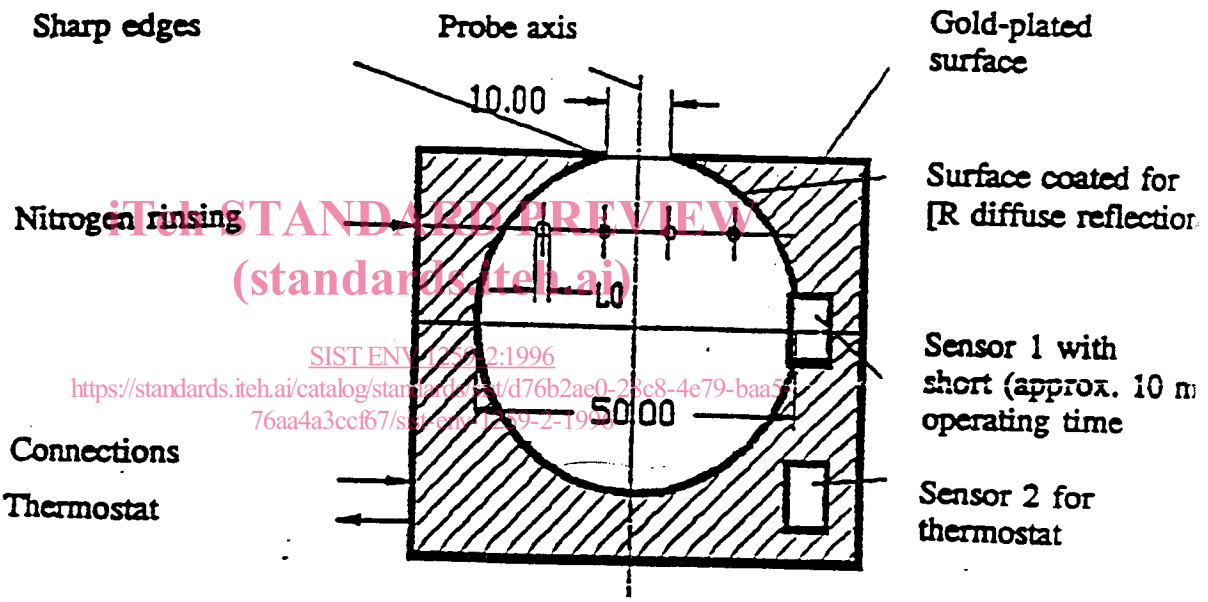
For the measurements, one or more than one sensor can be used at the same time, each calibrated with a cos-corrected evaluation of irradiation in a frequency range of minimum 0.8 µm to 40 µm.

6.2.1.2 Sensor Purging

Only sensors should be used which have thermostatically controlled nitrogen purge. Only sensors which do not substantially affect the function of the heater when in position on the measurement grid should be used.

Recommendation: The diameter of the sensor should not be larger than 100mm. The sensor for the cos-corrected evaluation of irradiation can for example be designed as shown in Sketch 3.

Sketch 3



It must be ascertained that sensor 1 does not receive any direct radiation. The cross section of the opening of the Ulbricht-Kugel globe should be under 5% and the cross section of all bores for the nitrogen purge should be under 0.1% of the globe surface area. Reference values for the flow of the nitrogen purge are as follows: approx 2 l/min over 10 drill holes each 0.9mm diameter. The holes for the nitrogen purge are to be arranged so that no flue gas or condensation can penetrate into the Ulbricht-Kugel and also so that the sensor 1 is not influenced by the flow of nitrogen. The inside of the Ulbricht-Kugel is to be coated so that a diffuse reflection over a frequency range of at least 0.8µm to 40µm is guaranteed.

The thermostat must ensure that during measurement the temperature of sensor 2 is constant (20 ± 1) °C.

6.2.1.3 Sensor Protection

The sensor opening has to be protected by a cover.

The upper surface of the sensor with the sensor opening is protected by a moving screen which is lifted away for a short time (approx 3 seconds) during the measurement of the sensor voltage.

Recommendation: The best design of a moving screen has proved to be one made out of two bright aluminium sheets. They are arranged one above the other where the lower sheet stays flat and the upper sheet forms the cover.