

Household and similar electrical appliances Safety —

Part 2-66: Particular requirements for
water-bed heaters

ICS 97.030

National foreword

This British Standard is the UK implementation of EN 60335-2-66:2003+A2:2012. It is identical to IEC 60335-2-66:2002, incorporating corrigendum July 2004, and amendments 1:2008 and 2:2011. It supersedes BS EN 60335-2-66:2003+A1:2006, which will be withdrawn on 4 October 2014.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by A1 .

The UK participation in its preparation was entrusted by Technical Committee CPL/61, Safety of household and similar electrical appliances, to Subcommittee CPL/61/07, Safety of electric appliances - Heated appliance group.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments/corrigenda issued since publication

Amd. No.	Date	Comments
15351 Corrigendum No. 1	24 August 2004	Correction to Subclause 3.1.9
	30 November 2008	Implementation of IEC amendment 1:2008 with CENELEC endorsement A1:2008
	30 April 2012	Implementation of IEC amendment 2:2011 with CENELEC endorsement A2:2012.

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EUROPEAN STANDARD

EN 60335-2-66:2003+A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2012

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Supersedes EN 60335-2-66:2003+ A1:2008

English version

Household and similar electrical appliances -

Part 2-66: Particular requirements for water-bed heaters

(IEC 60335-2-66:2002)

Appareils électrodomestiques
et analogues -
Sécurité
Partie 2-66: Règles particulières
pour les dispositifs de chauffage
pour matelas à eau
(CEI 60335-2-66:2002)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
Teil 2-66: Besondere Anforderungen
für Wasserbett-Beheizungen
(IEC 60335-2-66:2002)

This European Standard was approved by CENELEC on 2003-03-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees 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.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60335-2-66:2002 (61/2175/FDIS), prepared by the IEC Technical Committee 61, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60335-2-66 on 2003-03-01.

This European Standard replaces EN 60335-2-66:1995 + A1:2001.

The following dates are applicable:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-03-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 2006-03-01

This part 2 has to be used in conjunction with EN 60335-1, Household and similar electrical appliances – Safety – Part 1: General requirements. It was established on the basis of the 2002 edition of that standard. Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

This part 2 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard: Safety requirements for electric water-bed heaters.

When a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

NOTE 1 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.;
- subclauses, notes and annexes that are additional to those in the IEC standard are prefixed with the letter Z.

NOTE 2 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

There are no special national conditions causing a deviation from this European Standard, other than those listed in Annex ZA to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in Annex ZB to EN 60335-1.

Introduction

An investigation by CENELEC TC 61 has shown that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. For products having mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 98/37/EC has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

Endorsement notice

The text of the International Standard IEC 60335-2-66:2002 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 61/3534/FDIS, future amendment 1 to IEC 60335-2-66:2002, prepared by IEC Technical Committee 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60335-2-66:2003 on 2008-05-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2009-02-01
- date on which national standards conflicting with the amendment have to be withdrawn (dow) 2013-05-01

This amendment supplements or modifies the corresponding clauses of EN 60335-2-66:2003.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

Endorsement notice

The text of amendment 1:2008 to the International Standard IEC 60335-2-66:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

In the Bibliography, add the following note to the standard mentioned:

ISO 13732-1 NOTE Harmonized as EN ISO 13732-1:2006 (not modified).

Foreword to amendment A2

The text of document 61/4101/CDV, future edition 2 of IEC 60335-2-66:2002/A2, prepared by IEC/TC 61 "Safety of household and similar electrical appliances" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60335-2-66:2003/A2:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2012-09-04
- latest date by which the national standards conflicting with the document have to be withdrawn (ow) 2014-10-04

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

Endorsement notice

The text of the International Standard IEC 60335-2-66:2002/A2:2011 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another Part 2 of IEC 60335, the relevant Part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a Part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the Part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal and generic standards covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or Part 2 standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-66: Particular requirements for water-bed heaters

1 Scope

This clause of Part 1 is replaced by the following:

This International Standard deals with the safety of electric **water-bed heaters** and their associated control units, for household and similar purposes, their **rated voltage** being not more than 250 V.

Appliances not intended for normal household use, but that nevertheless may be a source of danger to the public, such as appliances intended to be used in hotels, are within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- Ⓐ) – persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledge
 prevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance. Ⓐ)

NOTE 101 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or in aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 102 This standard does not apply to appliances

- for medical purposes (IEC 60601);
- intended for immersion in water during use.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

ISO 2439, *Flexible cellular polymeric materials – Determination of hardness (indentation technique)*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

operation of the appliance after the heater has been installed under a water mattress, taking into account the installation instructions

The appliance is supported by a wooden base that is consistent with the size of the mattress. The top of the base consists of plywood approximately 13 mm thick and is supported 150 mm above the floor by pinewood boards approximately 20 mm thick. The boards are assembled to form a rectangular framework that includes a longitudinal and two transverse members to produce six approximately equal sections.

The wooden base is completely covered by a sheet of open-cell polyether approximately 25 mm thick. The polyether has the following composition:

- cell count: 18^{+2}_0 per cm²;
- specific mass: $30 \text{ kg/m}^3^{+10\%}_0$
- hardness: 120 N to 170 N at 40 % impression, measured according to ISO 2439.

NOTE 101 This polyether sheet is omitted if the instructions state that the heater is unsuitable for use on a soft support.

NOTE 102 Additional material is placed on the polyether sheet if this is stated in the instructions.

The heater, together with any control, is positioned on the polyether sheet. A piece of the bottom layer of water mattress material, having dimensions 100 mm x 200 mm, is folded to form a crease 50 mm x 200 mm. It is placed on the upper surface of the heater, parallel to the shortest side and approximately in the centre of the longest side.

The mattress is placed over the heater, filled with water and completely covered by a similar piece of polyether sheet approximately 36 mm thick.

3.101

water-bed heater

appliance incorporating a heating element within an enclosure and intended for use under a water mattress

NOTE 1 The appliance may be contained in an envelope of the mattress.

NOTE 2 The appliance may incorporate a **thermostat** having a sensing element that has to be positioned during installation.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.3 Addition:

The test of 21.101 is carried out immediately after the test of Clause 11.

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Addition:

The **rated voltage** of **class III appliances** shall not exceed 24 V.

6.2 Addition:

Parts of the appliance, other than those of **class III**, that are intended to be placed under the water mattress shall be at least IPX7.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

The appliance shall be marked with the substance of the following:

- read the instructions carefully;
- check that the heater, the mattress and any envelope are laid flat and without folds before filling the mattress with water;
- Ⓜ₂ – place the heater centrally under the mattress so that it does not project from the sides of the mattress enclosure; Ⓜ₂
- the support under the heater is to be flat, continuous and without sharp edges;
- use only to heat water-beds;
- this side up, if applicable;
- model or type reference of a detachable control unit, if applicable.

7.12 Addition:

The instructions shall include the substance of the following:

- the heater is only to be used with the type of detachable control unit that is marked on the appliance, if applicable;
- the appliance is not intended for use in hospitals;
- the appliance is intended only to heat water-beds;
- sharp objects such as needles and pins must not be inserted in the appliance;
- the orientation of the plug in the socket-outlet of class II appliances provided with a metal screen to minimize the capacitive leakage current and the electrostatic field. The means of checking the orientation shall be given;

NOTE 101 This does not apply to appliances having a polarized plug.

- bedding is not to come into contact with the heater.

7.12.1 Addition:

The installation instructions shall include the substance of the following:

- the details of the installation of the heater and its control. In particular, details shall be given regarding the correct positioning and installation of any temperature sensing element of the control unit, to ensure that it does not easily slip out of position;
- the minimum dimensions of the water mattress and the minimum amount of water with which it is to be filled;
- details of any additional supporting material required if the heater is installed on a soft support, or a statement that the heater is unsuitable for such installation.

7.101 Detachable control units shall be marked with:

- **rated voltage** or **rated voltage range** in volts;
- symbol for nature of supply, unless the **rated frequency** is marked;
- name, trade mark or identification mark of the manufacturer or responsible vendor;
- model or type reference;
- identification of the relevant **water-bed heater**.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 Replacement:

*The appliance is installed as specified for **normal operation**.*

11.3 Addition:

*The temperature rise of the surface of the **water-bed heater** and the surface temperature of the mattress are determined by means of fine-wire thermocouples attached to oxidized copper or brass plates measuring 65 mm x 65 mm x 0,5 mm.*

11.4 Addition:

Thermostats are short-circuited if their sensing elements are not fixed in relation to the heater after installation.

NOTE 101 Sensing elements are not considered to be fixed if they are positioned outside the enclosure of the heater and without provision for fixing.

11.7 Replacement:

The appliance is operated until steady conditions are established.

11.8 Addition:

The temperature rise of the surface of the **water-bed heater** shall not exceed 35 K except under the folded material where the limit is 60 K.

11.101 The appliance shall operate without risk of heat-stroke to the user.

Compliance is checked by the following test.

The appliance is operated as specified in 11.1 to 11.7 except that **thermostats** are not short-circuited. Controls are set in the lowest position.

The temperature of the upper surface of the water mattress shall not exceed 37 °C.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 Modification:

The leakage current of **class II appliances** provided with a metal screen connected to **live parts** shall not exceed 0,25 mA when the selector switch is in one position and 0,75 mA in the other position.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.2 Addition:

The test is carried out without the folded water mattress material.

The water mattress is empty.

19.4 Addition:

NOTE 101 This test is not carried out when the **thermostat** is short-circuited during the test of Clause 11.

19.13 Addition:

*The temperature rise of the surface of the **water-bed heater** shall not exceed 100 K.*

The tests shall not affect the degree of protection of the appliance against harmful ingress of water.

A2 19.101 *The appliance is operated under the conditions of Clause 11 but without the folded water mattress material. The **water-bed heater** is positioned so that it extends outside the water bed envelope by 10 cm along its longest side and it is supplied at **rated power input**.*

*The temperature rise of the surface of the **water-bed heater** that extends beyond the mattress enclosure shall not exceed 65 K but a first overshoot up to 95 K is allowed. **A2***

20 Stability and mechanical hazards

This clause of Part 1 is applicable.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.101 Appliances provided with a flexible support for the heater shall withstand the mechanical stresses that the heater may be subjected to during normal use.

Compliance is checked by the following test.

The appliance is operated as specified in Clause 11 but without the covering sheet of polyether.

The water mattress is subjected to a downward force of $950\text{ N} \pm 40\text{ N}$ by means of the wood block shown in Figure 101 that is positioned in the most unfavourable place. The force is applied 25 000 times at a rate of approximately 30 times per minute.

During the test, the power input shall not deviate from the power input measured at the start of the test by more than +5 % and –10 %.

After the test, the heater shall not be damaged to such an extent that compliance with this standard is impaired.

22 Construction

This clause of Part 1 is applicable except as follows.

22.101 Class II appliances having a metal screen connected to **live parts** shall incorporate a means to indicate that the plug has been inserted in the socket outlet so that the leakage current is minimum.

Compliance is checked by inspection and by manual test.

NOTE 1 This requirement does not apply to appliances having a polarized plug.

NOTE 2 The indicating means may require a manual action. A light-emitting diode that glows when a surface is touched is an example of a device that can be used.

22.102 Class I appliances having an earthed metal screen shall incorporate supplementary insulation between the screen and the **accessible surfaces**.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.5 Addition:

Natural rubber shall not be used for the insulation of internal wiring.

24 Components

A2 24.1.4 Modification:

*The number of cycles of operation for voltage-maintained **non-self-resetting thermal cut-outs** is increased to 10 000. **A2***

This clause of Part 1 is applicable except as follows.

24.2 Modification:

Appliances may be fitted with switches and control units in flexible cords

24.101 Thermal cut-outs shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type Z attachment is allowed.

25.7 *Modification:*

Light polyvinyl chloride sheathed cords are allowed regardless of the mass of the appliance.

25.15 *Modification:*

Instead of marking the cord at a distance of 20 mm, the cord is marked as close as possible to the cord anchorage.

Instead of the pull force and torque specified in Table 12, the following applies:

- cord anchorage of the **interconnection cord**:
 - pull force: 100 N;
 - torque: 0,1 Nm
- cord anchorage of the **supply cord**:
 - pull force: 60 N;
 - torque: 0,1 Nm.

25.23 *Addition:*

The insulation of **interconnection cords** shall be at least equivalent to that of ordinary polyvinyl chloride sheathed flexible cord (code designation 60227 IEC 53).

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable except as follows.

29.3 *Addition:*

If the insulation is in more than one layer, it shall not be accessible after installation of the heater.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.1 Addition:

The test is not applied to the enclosure of the heater.

30.2.2 Not applicable.

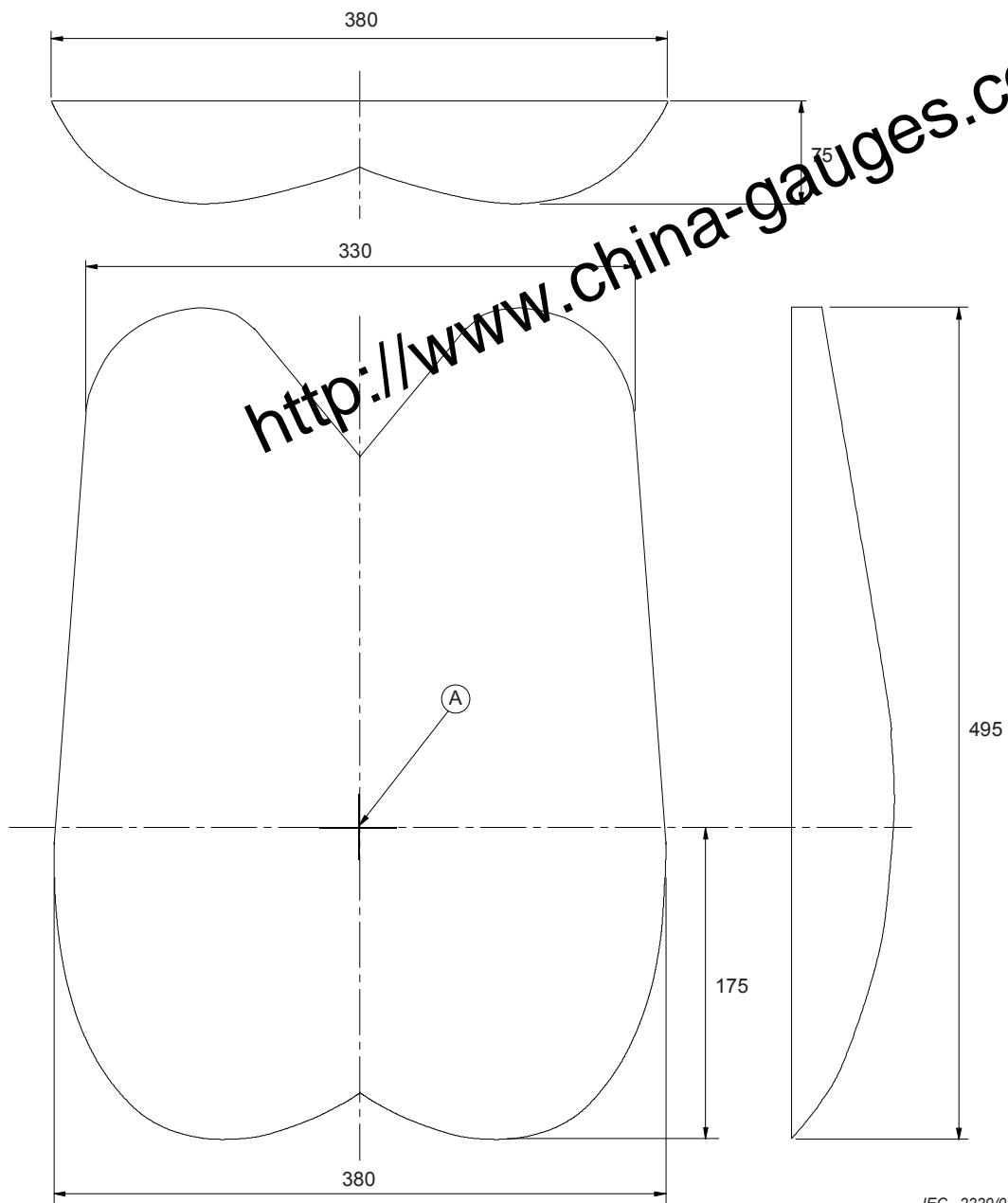
31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

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Key

A Point of application of the load

Figure 101 – Wood block

Annexes

The annexes of Part 1 are applicable.

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Annex ZC (normative)

Normative references to international publications with their corresponding European publications

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 2439	– ¹⁾	Flexible cellular polymeric materials – Determination of hardness (indentation technique)	EN ISO 2439	2000 ²⁾

Bibliography

A1 The bibliography of Part 1 is applicable except as follows.

Addition:

ISO 13732-1, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces* **A1**

¹⁾ undated reference

²⁾ valid edition at date of issue

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