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INTERNATIONAL STANDARD

colour inside

Plugs and socket-outlets for household and similar purposes – Part 1: General requirements

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60884-1 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2006 and Amendment 2:2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) plugs and socket-outlets incorporating pilot lights;
b) crimped connections in accessories;
c) insulation piercing terminals (IPT);
d) accessories to be used with American Wire Gauge (AWG) cables;
e) accessories used in T° below −5 °C down to and including −45 °C;
f) accessories used in T° above +40 °C up to and including +70 °C;

g) plugs and socket-outlets for high load (HL);

h) clarification of some definitions;

i) durability of markings test;

j) introduction of thermal monitoring in the plug;

k) requirements for shutters in portable socket-outlets;

l) test walls for the verification of ingress of water;

m) rewriting of the temperature rise clause.

The text of this International Standard is based on the following documents:

Draft	Report on voting
23B/1386/FDIS	23B/1400/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 60884 series, published under the general title *Plugs and socket-outlets for household and similar purposes*, can be found on the IEC website.

The following print types are used:

– requirements: in roman type;

– test specifications: in *italic* type;

– notes: in small roman type.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 1: General requirements

1 Scope

This part of IEC 60884 applies to plugs and fixed or portable socket-outlets for AC only, with or without earthing contact, with a rated voltage greater than 50 V but not exceeding 440 V and a rated current not exceeding 32 A, intended for household and similar purposes, either indoors or outdoors.

Compatible plugs and socket-outlets, when combined, form a plug and socket-outlet system. Standardized systems used around the world are reported in IEC/TR 60083.

The rated current is limited to 16 A maximum for accessories provided with screwless-type terminals.

This document covers only those requirements for mounting boxes which are necessary for the tests on the socket-outlet.

NOTE 1 Requirements for general purpose mounting boxes are given in IEC 60670-1.

This document also applies to:

– plugs which are a part of cord sets;
– plugs and portable socket-outlets which are a part of cord extension sets;
– plugs and socket-outlets which are a component of an appliance, unless otherwise stated in the standard for the relevant appliance; and
– plugs and socket-outlets incorporating pilot lights.

This document does not apply to:

– plugs, socket-outlets and couplers for industrial purposes;
– appliance couplers;
– plugs, fixed and portable socket-outlets for extra low voltage (ELV);

NOTE 2 ELV values are specified in IEC 60364-4-41.

– fixed socket-outlets combined with fuses, automatic switches, etc.

Plugs of this document are intended to be energised by socket-outlets.

NOTE 3 Use in any other manner could result in unsafe conditions within the installation if proper precautions are not taken. When energy producing equipment is connected to the fixed installation via plugs of this document all safety aspects of the products and the installation need to be evaluated by the manufacturer of the energy producing equipment.

Plugs and socket-outlets complying with this document are suitable for use at ambient temperatures not normally exceeding +40 °C, but their average temperature over a period of 24 h does not exceed +35 °C, with a lower limit of the ambient air temperature of −5 °C.

In locations where special conditions prevail, such as in ships, vehicles and the like and in hazardous locations, for example where explosions are liable to occur, additional requirements can be applicable.

This document gives additional requirements for accessories intended to be used with AWG cables, see Annex D (normative).

This document gives additional tests to be applied during the production of crimped connections in accessories, see Annex E (informative).

This document gives additional requirements for accessories provided with insulation-piercing terminals, see Annex F (normative).

This document gives additional specifications for accessories intended to be used in ambient temperatures below −5 °C down to and including −45 °C, see Annex G (informative).

This document gives additional specifications for accessories intended to be used in ambient temperatures above +40 °C up to and including +70 °C, see Annex H (informative).

This document gives additional requirements for plugs and socket-outlets for high load (HL). These plugs and socket-outlets are typically intended to be used for loads applying long and repetitive cycles up to the rated current of the accessories, see Annex I (normative).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

IEC 60417, *Graphical symbols for use on equipment* (available at http://www.graphical-symbols.info/equipment)

IEC 60423:2007, *Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60669 (all parts), *Switches for household and similar fixed-electrical installations*

IEC 60669-2-1:2021, *Switches for household and similar fixed electrical installations – Part 2-1: Particular requirements – Electronic control devices*

IEC 60695-2-10:2021, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end products (GWEPT)*

IEC 60884-2-1, *Plugs and socket-outlets for household and similar purposes – Part 2-1: Particular requirements for fused plugs*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058 (all parts), *Switches for appliances*

IEC 61545, *Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

ISO 1456:2009, *Metallic and other inorganic coatings – Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 2081:2018, *Metallic and other inorganic coatings – Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2093:1986, *Electroplated coatings of tin – Specification and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

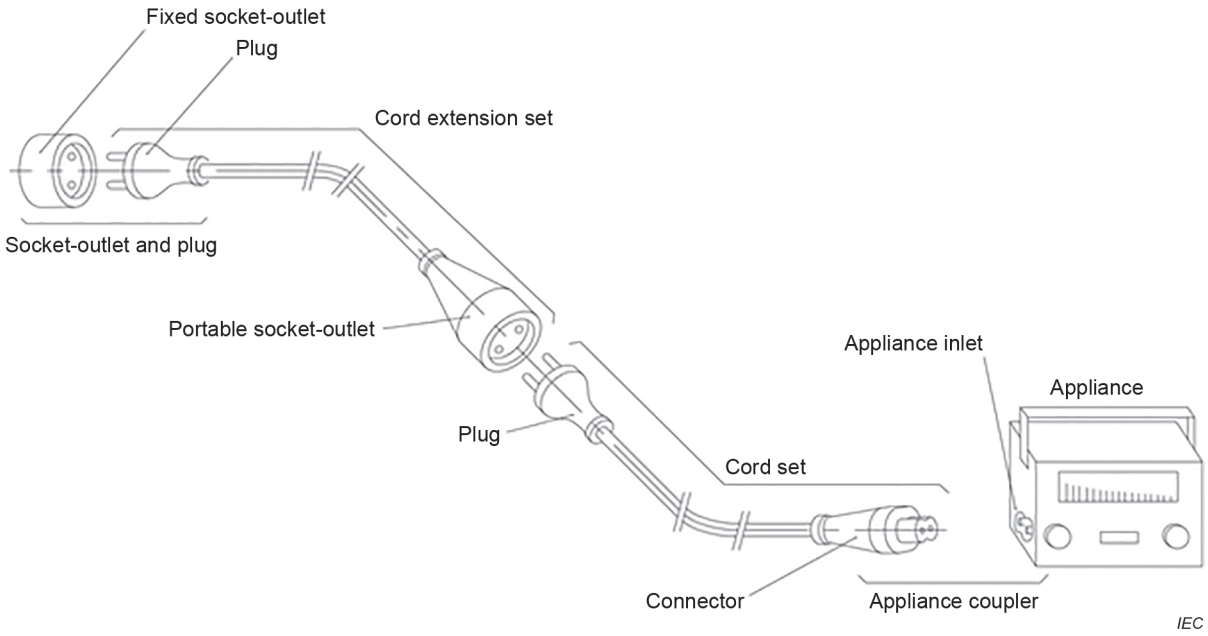
- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

NOTE 1 Where the terms "voltage" and "current" are used, they imply RMS values, unless otherwise specified.

NOTE 2 Throughout this document the word "earthing" is used for "protective earthing" unless otherwise stated.

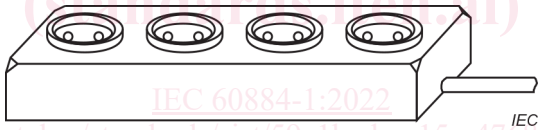
NOTE 3 The term "accessory" is used as a general term covering plugs and socket-outlets; the term "portable accessory" covers plugs and portable socket-outlets. Examples of the use of accessories are shown in Figure 1 a).

NOTE 4 Throughout this document the term "socket-outlet" covers both fixed and portable socket-outlets, except where the reference is specific to one type or the other.



a) Diagram showing various accessories and their use

NOTE Appliance, appliance inlet and appliance coupler are used in this figure only for illustration purposes and they are not covered by this document.



b) Example of a multiple socket-outlet

Figure 1 – Examples of accessories

3.1
plug
accessory having pins designed to engage with the contacts of a socket-outlet

Note 1 to entry: A plug allows the manual connection and disconnection of an electrical load to an electrical supply by an ordinary person.

Note 2 to entry: The plug can be connected to a cable or integrated into an accessory.

Note 3 to entry: In adaptors, the plug can be integral or detachable, see IEC 60884-2-5.

Note 4 to entry: For special purposes such as lighting chains (see also IEC 60598-2-20), two or three single-core cables can be connected within the plug.

3.2
socket-outlet
accessory having socket-contacts designed to engage with the pins of a plug

Note 1 to entry: The socket-outlet can be connected to a cable or integrated into an accessory.

Note 2 to entry: In adaptors, the socket-outlet can be integral or detachable, see IEC 60884-2-5.

3.3
fixed socket-outlet
socket-outlet intended to be installed at a fixed location and be connected to fixed wiring

3.4
portable socket-outlet
socket-outlet intended to be connected to or integral with one flexible cable and which can easily be moved from one place to another while connected to the supply

3.5
multiple socket-outlets
combination of two or more socket-outlets

Note 1 to entry: An example is shown in Figure 1 b).

3.6
rewirable plug
plug so constructed that the flexible cable can be replaced

3.7
non-rewirable plug
assembly of the plug and the flexible cable so constructed that the flexible cable cannot be replaced

3.8
rewirable portable socket-outlet
socket-outlet so constructed that the flexible cable can be replaced

3.9
non-rewirable portable socket-outlet
assembly of the socket-outlet and the flexible cable so constructed that the flexible cable cannot be replaced

3.10
moulded-on accessory
non-rewirable portable accessory the manufacture of which is completed by insulating material moulded around pre-assembled component parts and the terminations for the flexible cable

[SOURCE: IEC 60050-442:1998, 442-01-14, modified – "portable" has been added to the definition and "or cord" has been omitted.]

3.11
mounting box
box intended for mounting in or on a wall, floor or ceiling, etc., for flush or surface application, intended for use with fixed socket-outlet(s)

3.12
cord set
assembly consisting of a flexible cable or cord fitted with a non-rewirable plug and a non-rewirable connector, intended for the connection of an electrical appliance to the electrical supply

[SOURCE: IEC 60050-442:1998, 442-07-04, and IEC 60050-442:2008, 461-06-16]

3.13
cord extension set
assembly consisting of one flexible cable fitted with one plug and one single or multiple portable socket-outlets

3.14
terminal
insulated or non-insulated connecting device intended for reusable electrical connection of the external conductors

3.15
termination
insulated or non-insulated connecting device intended for non-reusable electrical connection of the external conductors

3.16
clamping unit
part(s) of the terminal necessary for the mechanical clamping and the electrical connection of the conductor(s), including the parts which are necessary to ensure correct contact pressure

[SOURCE: IEC 60050-442:1998, 442-06-12]

3.17
screw-type terminal
terminal for the connection and subsequent disconnection of one conductor or the interconnection and subsequent disconnection of two or more conductors, the connection being made, directly or indirectly, by means of screws or nuts of any kind

Note 1 to entry: Term entries 3.18 to 3.23 are examples of screw-type terminals.

3.18
pillar terminal
screw-type terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the end of the screw or screws

Note 1 to entry: The clamping pressure may be applied directly by the end of the screw or through an intermediate clamping member to which pressure is applied by the end of the screw.

Note 2 to entry: Examples of pillar terminals are shown in Figure 9.

3.19
stirrup terminal
pillar terminal where the clamping pressure may be applied indirectly by an intermediate clamping member when the screw is tightened

Note 1 to entry: Examples of stirrup terminals are shown in Figure 9.

3.20
screw head terminal
screw-type terminal in which the conductor is clamped under the head of the screw

Note 1 to entry: The clamping pressure may be applied directly to the head of a screw or through an intermediate part, such as a washer, clamping plate or anti-spread device.

Note 2 to entry: Examples of screw head terminals are shown in Figure 10.

3.21
stud terminal
screw-type terminal in which the conductor is clamped under a nut

Note 1 to entry: The clamping pressure may be applied directly by a suitably shaped nut or through an intermediate part, such as a washer, clamping plate or anti-spread device.

Note 2 to entry: Examples of stud terminals are shown in Figure 10.