PAKISTAN STANDARD

PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES –

PART 2-2: PARTICULAR REQUIREMENTS FOR SOCKET-OUTLETS FOR APPLIANCES

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PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES - PART 2-2: PARTICULAR REQUIREMENTS FOR SOCKET-OUTLETS FOR APPLIANCES

0. FOREWORD

0.1 This Pakistan Standard was adopted by the authority of the Board of Directors for Pakistan Standards and Quality Control Authority after approval by the Technical Committee for "Plugs and socket-outlets for household and similar purposes - Part 2-2: Particular requirements for socket-outlets for appliances" had been approved and endorsed by the Electrotechnical National Standards Committee on _____.

0.2 This Pakistan Standard was adopted on the basis of IEC: 60884-2-2 since IEC Standard have been established in 2006, hence it is deemed necessary to adopt the International standard to keep abreast with the latest technology and as per with IEC standard.

0.3 This Pakistan Standard is an adoption of IEC: 60884-2-2 "Plugs and socket-outlets for household and similar purposes - Part 2-2: Particular requirements for socket-outlets for appliances" and its use hereby acknowledged with thanks.

0.4 This standard is subject to periodical review in order to keep pace with the development in industry. Any suggestions for improvement shall be recorded and placed before the revising committee in due course.

0.5 This standard is intended chiefly to cover the technical provisions relating to this standard and it does not include all the necessary provisions of a Contract.

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PLUGS AND SOCKET-OUTLETS FOR HOUSEHOLD AND SIMILAR PURPOSES –

Part 2-2: Particular requirements for socket-outlets for appliances

1 Scope

This clause of Part 1 is applicable except as follows.

Replacement of the first paragraph:

This part of IEC 60884 applies to socket-outlets for a.c. only, with or without earthing contact, with a rated voltage not exceeding 250 V and a rated current not exceeding 16 A, which are integrated or intended to be incorporated in or fixed to appliances, hereafter referred to as socket-outlets for appliances.

Addition after the fourth paragraph:

Socket-outlets for appliances are provided with means for fixing into appropriate mounting boxes, if intended also for use in fixed installations.

Socket-outlets for appliances are intended to be used in stationary equipment and appliances such as office machines, computers, audio-visual and video equipment, range hoods, ranges, etc.

If necessary, the use of socket-outlets for appliances is indicated in the standards for the appropriate equipment or appliance.

The temperature around socket-outlets for appliances must not exceed 35 °C.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

3 Definitions

This clause of Part 1 is applicable except as follows.

3.6 *Replacement:*

socket-outlet for appliances
socket-outlet integral with, or intended to be incorporated in, or fixed to, an electrical appliance

Addition:

3.101
flat quick-connect termination
electrical connection consisting of a male tab and female connector which can be readily inserted and withdrawn without the use of a tool

NOTE Other terms, such as: "snap-on connector", "flat push-on connector" are sometimes used.

3.102
female connector
portion of a flat quick-connect termination which is pushed on to the male tab

3.103
male tab
portion of a flat quick-connect termination which receives the female connector

4 General requirements

This clause of Part 1 is applicable.

5 General notes on tests

This clause of Part 1 is applicable except as follows.

Addition:

5.101 If socket-outlets for appliances are provided with male tabs of flat quick-connect terminations, new female connectors shall be used for each test according to Clauses 19, 20 and 21.

These female connectors shall be made from unplated copper alloy.

6 Ratings

This clause of Part 1 is applicable except as follows.

6.1 *Addition:*

For socket-outlets for appliances, Table 1 applies up to and including a rated current of 16 A and up to and including a rated voltage of 250 V.

7 Classification

This clause of Part 1 is applicable.

8 Marking

This clause of Part 1 is applicable.

9 Checking of dimensions

This clause of Part 1 is applicable.

10 Protection against electric shock

This clause of Part 1 is applicable.

11 Provision for earthing

This clause of Part 1 is applicable.

12 Terminals and terminations

This clause of Part 1 is applicable except as follows.

12.1.1 *Addition after the first paragraph:*

Socket-outlets for appliances shall be provided with screw-type terminals, screwless terminals or male tabs of flat quick-connect terminations.

Notes a and b of Table 3 are not applicable.

Addition:

12.101 Flat quick-connect terminations

Male tabs and female connectors to be used for test purposes shall comply with IEC 61210.

12.101.1 Constructional requirements

12.101.1.1 Male tabs shall be of nominal sizes:

2,8 mm × 0,8 mm or

4,8 mm × 0,8 mm or

6,3 mm × 0,8 mm,

as detailed in IEC 61210.

Compliance is checked by measuring three specimens, all of which shall comply with the dimensional requirements of IEC 61210.

Round dimple indents, rectangular dimple indents, hole indents or provisions for non-reversible flat quick-connect terminations, if any, shall also comply with IEC 61210.

12.101.1.2 Male tabs shall be made from copper or copper alloy (bare or tin plated). Materials or coatings other than those specified may be used, provided that their electrical and mechanical characteristics are no less reliable, particularly with regard to resistance to corrosion, stability of contact resistance and mechanical strength.

12.101.1.3 Male tabs shall have adequate strength to allow the application and removal of female connectors without damage to the socket-outlet so as to impair compliance with this standard.

Compliance is checked by applying, without jerks, axial forces equal to those shown in Table 101.

No displacement or damage shall occur which might impair further use.

Table 101 – Forces to be applied to tabs

Male tab size (nominal) mm	**Push*** N	**Pull*** N
2,8 × 0,8	50	40
4,8 × 0,8	60	50
6,3 × 0,8	80	70

* These values are the maximum allowed for the insertion and withdrawal of a female connector onto and from a male tab.

12.101.1.4 Male tabs shall be adequately spaced to allow the connection of the appropriate female connectors.

Compliance is checked by applying an appropriate female connector to each male tab; during this operation, no strain or distortion shall occur to any of the tabs or to their adjacent parts, nor shall the creepage distance or clearance be reduced below those specified in Clause 27.

12.101.2 Electrical requirements

Male tab sizes shall be related to the rated current of the socket-outlet as shown in Table 102.

Table 102 – Relationship between tab size and rated current

Male tab size (nominal) mm	**Maximum rated current** A
2,8 × 0,8	6
4,8 × 0,8	10
6,3 × 0,8	16

13 Construction of fixed socket-outlets

This clause of Part 1 is applicable except as follows.

13.21 *Replacement:*

Socket-outlets for appliances shall be so designed that the assembling of their component parts is not affected by the method of fixing the socket-outlet to the appliance.

The method of fixing shall be such that the socket-outlet cannot turn and cannot be detached from the appliance without the aid of a tool.

14 Construction of plugs and portable socket-outlets

This clause of Part 1 is not applicable.

15 Interlocked socket-outlets

This clause of Part 1 is applicable.

16 Resistance to ageing, protection provided by enclosures, and resistance to humidity

This clause of Part 1 is applicable.

17 Insulation resistance and electric strength

This clause of Part 1 is applicable.

18 Operation of earthing contacts

This clause of Part 1 is applicable.

19 Temperature rise

This clause of Part 1 is applicable.

20 Breaking capacity

This clause of Part 1 is applicable.

21 Normal operation

This clause of Part 1 is applicable.

22 Force necessary to withdraw the plug

This clause of Part 1 is applicable.

23 Flexible cables and cords and their connection

This clause of Part 1 is not applicable.

24 Mechanical strength

This clause of Part 1 is applicable except as follows.

Addition:

– for socket-outlets for appliances ..... Subclause 24.101.

Addition:

24.101 Socket-outlets for appliances are checked by applying blows by means of the spring-hammer test apparatus as described in IEC 60068-2-75.

All surfaces which are accessible when the socket-outlet for appliances is mounted as in normal use are tested with the above test apparatus.

Socket-outlets integral with or designed to be incorporated in an appliance are tested as in normal use.

Socket-outlets designed to be fixed to an appliance are mounted on a vertical sheet of plywood 8 mm thick and 175 mm square without any metallic back plate, the plywood being mounted on a rigid frame which is fixed to a solid wall of brick, concrete or the like.

Blows are applied to all accessible surfaces, the test apparatus being calibrated to deliver an energy corresponding to that delivered by the striking element of the pendulum, as shown in the relevant figures and Table 21 of Part 1.

For all such surfaces, three blows are applied to each of the three weakest points (maximum nine blows).

NOTE 1 The following energy values of the spring hammer are considered as corresponding to those delivered by the pendulum. See Table 103.

Table 103 – Relationship between height of fall of pendulum and spring hammer energy

Height of fall mm	Energy J
100	0,22 ± 0,05
150	0,33 ± 0,05
200	0,44 ± 0,05
250	0,55 ± 0,05

Care is taken that the results from one series of three blows do not influence subsequent series. If there is doubt as to whether a defect has been caused by the application of preceding blows, this defect is neglected and the group of three blows which led to the defect is applied to the same place on a new sample, which shall then comply with the test.

After the test, the specimens shall show no damage within the meaning of this standard: in particular, live parts shall not have become accessible to the test probe B of IEC 61032.

NOTE 2 Damage to the finish, small dents which do not reduce creepage distances or clearances below the values specified in 27.1 and small chips which do not adversely affect the protection against electric shock or harmful ingress of water are neglected.

Cracks not visible with normal or corrected vision, without additional magnification, and surface cracks in fibre-reinforced mouldings and the like, are ignored.

Cracks or holes in the outer surface of any part of the socket-outlet are ignored if the socket-outlet complies with this standard even if this part is omitted.

25 Resistance to heat

This clause of Part 1 is applicable.

26 Screws, current-carrying parts and connections

This clause of Part 1 is applicable.

27 Creepage distances, clearances and distances through sealing compound

This clause of Part 1 is applicable except as follows.

27.1 *Addition*:

Socket-outlets for appliances are tested with the metal frame, if any, placed in the most unfavourable positions if this frame, acting as a support, is movable.

28 Resistance of insulating material to abnormal heat, to fire and to tracking

This clause of Part 1 is applicable except as follows.

Addition before 28.1:

For the purpose of this test, socket-outlets for appliances are considered to be fixed socket-outlets.

29 Resistance to rusting

This clause of Part 1 is applicable.

30 Additional tests on pins provided with insulating sleeves

This clause of Part 1 is not applicable.