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(पहला पुनरीक्षण)

Luminaires
Part 5 Particular Requirements
Section 6 Handlamps
(First Revision)

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NATIONAL FOREWORD

This Indian Standard (Part 5/Sec 6) (First Revision) which is identical to IEC 60598-2-8 : 2013 'Luminaires — Part 2-8: Particular requirements — Handlamps' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Illumination Engineering and Luminaires Sectional Committee and approval of the Electrotechnical Division Council.

This standard was first published in year 2013 to align it with the IEC 60598-2-8 : 1996. This revision has been brought out to align it with the latest version of IEC 60598-2-8 : 2013.

This revision includes the following significant technical change with respect to the previous version:

- a) References to IS 10322 (Part 1) have been updated.

This standard covers only the safety requirements of handlamps.

This standard (Part 5/Sec 6) is one among the series of Indian Standards which deals with luminaires. The other parts and sections are as follows:

Part 1	General requirements
Part 5	Particular requirements,
Sec 1	Fixed general purpose luminaires
Sec 2	Recessed luminaires
Sec 3	Luminaires for road and street lighting
Sec 4	Portable general purpose luminaires
Sec 5	Flood lights
Sec 7	Lighting chains
Sec 8	Luminaires for emergency lighting
Sec 18	Luminaires for swimming pools and similar applications

The text of the IEC standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appears referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exists. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
IEC 60598-1 Luminaires — Part 1: General requirements and tests	IS 10322 (Part 1) : 2026 Luminaires: Part 1 General requirements and tests (second revision) (IEC 60958-1 : 2024, MOD)	Modified

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Indian Standard
LUMINAIRES
PART 5 PARTICULAR REQUIREMENTS
SECTION 6 HANDLAMPS
(First Revision)

8.1 Scope

This part of the IEC 60598 series specifies requirements for handlamps and similar portable luminaires which are held in the hand, hooked up or resting on a surface for use with electric light sources on supply voltages not exceeding 250 V. It is to be read in conjunction with those sections of Part 1 to which reference is made.

Handlamps which can be fixed to a support by means of a wing screw, clip or magnet, and luminaires intended for inspection of the interior of barrels, are within the scope of this part of IEC 60598.

8.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 60598-1, *Luminaires – Part 1: General requirements and tests*

8.3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60598-1, as well as the following apply.

8.3.1

handlamp

luminaire with a handle and a flexible cable or cord, intended to be moved frequently while connected to the supply

8.3.2

rewirable handlamp

handlamp with a type X or Y attachment

8.3.3

non-rewirable handlamp

handlamp with a type Z attachment

8.3.4

sealed handlamp

handlamp of which all protective covers are sealed and which makes it impossible to replace the lamp without destroying the handlamp

8.4 General test requirements

8.4.1 The provisions of Section 0 of IEC 60598-1 apply together with the requirements of 8.4.2. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this Part 2-8.

8.4.2 The requirements of the third paragraph of 0.4.2 of Section 0 of IEC 60598-1 do not apply.

In general, four samples are necessary for the tests, three of which are subjected to the tests of 8.7.6, the fourth sample being subjected to the other tests.

All four samples shall be subjected to the test for rough service hand-held luminaires of 4.13.4 b) of IEC 60598-1.

For handlamps provided with a rubber protection cover, an additional sample is necessary for the test of 8.13.1.

Where a range of similar handlamps is involved, the specified tests are made on a representative complete set from the range. This set shall include handlamps, together with any attachments, which represents the most unfavourable combination.

8.5 Classification of luminaires

Luminaires shall be classified in accordance with the provisions of Section 2 of IEC 60598-1 together with the requirements of 8.5.1 and 8.5.2.

8.5.1 According to the type of protection against electric shock, handlamps shall be classified as class II or class III.

8.5.2 According to the method of connecting the cable or cord, handlamps shall be classified as:

- rewirable handlamps, or
- non-rewirable handlamps.

8.6 Marking

The provisions of Section 3 of IEC 60598-1 apply, together with the requirements of 8.6.1, and 8.6.2.

8.6.1 The symbol for class II or class III, the marking for rated voltage of class III handlamps and the symbol for the degree of protection against dust and moisture shall be on the outside of the handlamp.

This requirement is met if the marking is visible from the outside through a translucent cover.

The marking for maximum rated wattage shall not be in paint or ink, even when protected by varnish.

Compliance shall be checked by inspection and by the test described in Section 3 of IEC 60598-1.

8.6.2 For handlamps with replaceable lamps and with type X attachment, the instructions regarding the method of opening and closing the luminaire shall be marked on the protective cover and shall remain visible during and after use.

8.7 Construction

The provisions of Section 4 of IEC 60598-1 apply, together with the requirements of 8.7.1 to 8.7.6.

8.7.1 The shell and handle of the handlamp shall be of insulating material.

8.7.2 The lamp shall be protected against accidental damage by a protective grid, translucent cover or similar protective means. These devices shall be rigidly fixed to the body of the handlamp and it shall not be possible to remove the device by hand.

The protective device shall remain attached to the handlamp during the lamp replacement, e.g. by a hinge, chain or equally effective device. If an automatic switch interrupts the operation of the luminaire, when the protective device is removed for maintenance, the protective device may not be permanently attached to the luminaire.

For handlamps with magnetic ballast for tubular fluorescent lamps, the removal of the protective device shall be so arranged that the opening occurs at the end of the lamp where the lamp holder is connected to the magnetic ballast.

If the protective device is of metal, it shall be so positioned or protected by insulation that it is not likely to be inadvertently touched when holding the handle. The distance between the glass of the tungsten filament lamp or the tubular fluorescent lamp or any protective glass and a plane through the outside of two adjacent bars of a protective grid or a protective cover, shall be at least 3 mm.

Suspension hooks, if any, shall be securely fixed to the handlamp.

Compliance is checked by inspection, by measurement and by loading the hook with a weight which is twice the weight of the luminaire, including the total weight of the attached cable, cord, ballast or transformer. The hook shall not deform such that the luminaire slips from the means of suspension which for testing purposes, is a 1 mm $\varnothing$ metal bar.

8.7.3 Handlamps shall not use resistive ballasts or resistive cables to limit the current in discharge lamps.

8.7.4 Lampholders for tungsten filament lamps shall be locked against rotation by at least two independent means, at least one of which shall be operable only with the aid of a tool. The means of fixing shall not serve to fix any other part.

Compliance shall be checked by inspection and by manual test.

8.7.5 Ballasts or transformers where connected in the flexible cable or cord shall be at a distance not greater than 1 m from the plug and equipped with a suspension hook.

Compliance shall be checked by inspection, by manual test and by measurement.

8.7.6 The test for mechanical strength described in 4.13 of Section 4 of IEC 60598-1 does not apply, except the test of 4.13.4 b) as mentioned in 8.4.2. In addition, the mechanical

strength shall be checked by the test described in 8.7.6.1, if applicable, and by the tests described in 8.7.6.2.

8.7.6.1 The grid, translucent covers and protective covers shall be firmly fixed.

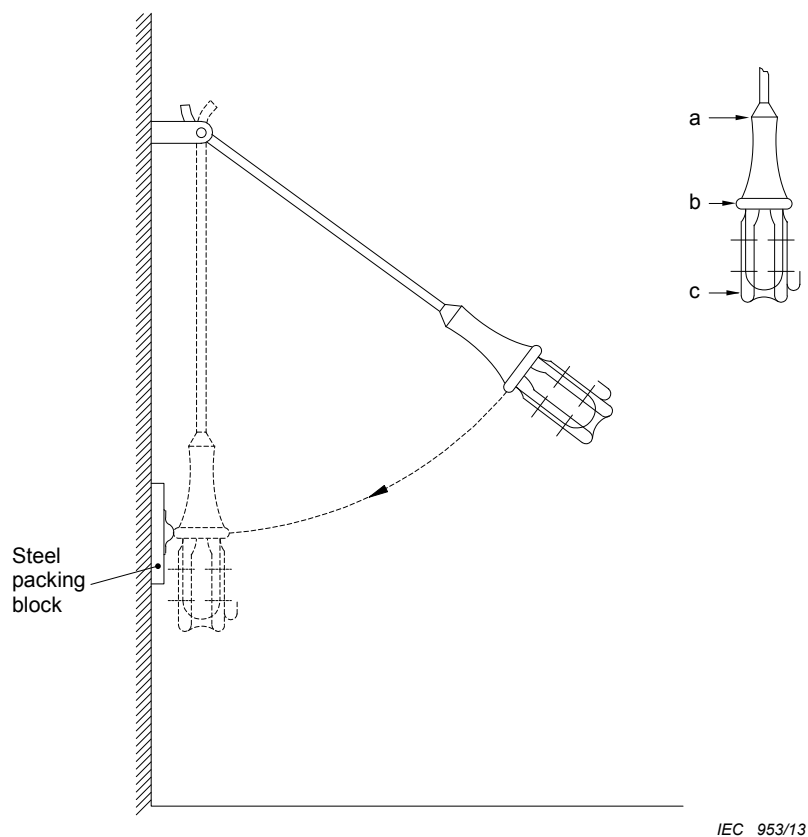
Compliance is checked by a pull of 100 N for 1 h, applied to the parts of the body of the handlamp which, when loose, would allow to touch current-carrying parts.

For handlamps containing tubular fluorescent lamps this is likely along its longitudinal axis.

For sealed handlamps, in addition a torque test of 10 Nm shall be applied to the parts which, when loose, would allow to touch current-carrying parts.

The grid or protective covers shall remain in position during and after the test.

8.7.6.2 The handlamp, fitted with a flexible cable or cord in accordance with the requirements of 8.11.2 and of suitable length, is subjected to two impact tests in which it is caused to swing against a steel bar which is mounted on a solid wall of brick, stone, concrete or similar material, as shown in Figure 1.



The steel packing block is necessary only if the shape of the handlamp is such that, without it, the handlamp does not hit the bar.

For the key and further explanations, see 8.7.6.2.

Figure 1 – Arrangement for impact test for handlamps

The bar is of 40 mm × 40 mm × 5 mm right-angle section with the corner rounded to a radius of 5 mm. It is mounted in contact with the wall or, if necessary, in contact with a steel packing block which is in contact with the wall.

The handlamp, without lamp, is suspended by its flexible cable or cord so that the point "a", indicated in Figure 1, rests against the corner of the bar, the point of suspension being 400 mm above the bar. It is then drawn away from the bar in a plane perpendicular to the wall until the cable or cord is horizontal.

The sample is allowed to fall against the bar three times in this way. It is then suspended so that the impact is at the point "b", and caused to fall similarly three times, followed by three falls against the point "c".

After this first test, the sample shall show no damage impairing its safety or further use. The whole of the above test is then repeated but with the point of suspension 1 m above the bar.

After this second test, the sample shall show no damage impairing its safety or further use. The means protecting the lamp against damage shall not have loosened, even if it has become deformed. Breakage of the protective glass of translucent cover, if any, is neglected, if it is not the sole means protecting the lamp against damage.

8.8 Creepage distances and clearances

The provisions of Section 11 of IEC 60598-1 apply.

8.9 Provision for earthing

The provisions of Section 7 of IEC 60598-1 do not apply.

8.10 Terminals

The provisions of Sections 14 and 15 of IEC 60598-1 apply, together with the requirements of 8.10.1.

8.10.1 Terminals for supply connection shall be suitable for the connection of conductors having nominal cross-sectional areas from 0,75 mm² to 1,5 mm².

Compliance shall be checked by fitting conductors of the smallest and largest cross-sectional areas specified.

8.11 External and internal wiring

The provisions of Section 5 of IEC 60598-1 apply, together with the requirements of 8.11.1 to 8.11.6.

8.11.1 Rewirable handlamps shall be equipped with type X attachment.

Non-rewirable handlamps shall be equipped with type Y or Z attachment.

Handlamps shall not be provided with socket-outlets.

Handlamps other than ordinary shall not be provided with appliance inlets. Where ordinary handlamps are provided with appliance inlets, they shall have mechanical locking.

Compliance shall be checked by inspection.

8.11.2 Flexible cables or cords shall be not lighter than the following types specified in:

- 60227 IEC 53 for ordinary handlamps,
- 60245 IEC 57 for other than ordinary handlamps.

The nominal cross-sectional area of the conductors shall be not less than:

- 0,75 mm² for ordinary handlamps,
- 1 mm² for other handlamps.

Compliance shall be checked by inspection.

NOTE In Australia and New Zealand, different cable materials and requirements apply. Refer to the regional standard.

8.11.3 Handlamps shall have only one cable entry.

Compliance shall be checked by inspection.

8.11.4 The requirements of 5.2.7 and 5.2.8 of Section 5 of IEC 60598-1 do not apply.

Flexible cables and cords shall be protected against excessive bending at the inlet opening of the handlamp and the plug-ballast/transformer (where applicable) by means of a cord guard of insulating material or a suitably shaped inlet opening.

For cord guards,

- they shall not be integral with the flexible cable or cord, for rewirable handlamps;
- they shall be fixed in a reliable manner so that they cannot readily be lost;
- they shall project outside the handlamp for a distance of at least 25 mm beyond the inlet opening;
- they shall have adequate mechanical strength and elasticity.

Compliance shall be checked by inspection, by measurement and by the tests described in 8.11.4.1.

8.11.4.1 For non-rewirable handlamps and for rewirable handlamps, the part of the handlamp carrying the cable entry is fixed to the oscillating member of an apparatus similar to that shown in Figure 2, so that when this is at the middle of its travel the axis of the flexible cable or cord, where it enters the sample, is vertical and passes through the axis of oscillation.

The cable or cord is loaded with a weight such that the force applied is 20 N.

A current, the value of which is derived from the maximum rated wattage and the rated voltage, is passed through the conductors, the voltage between the contacts of the lampholder being equal to the rated voltage.

The oscillating member is moved backwards and forwards through an angle of 90° (45° on either side of the vertical), the number of flexings being 20 000 and the rate of flexing 60 per minute.

After the test, not more than 50 % of the strands in a conductor shall be broken, and the cord or cable shall be subjected to, and shall satisfy, the insulation resistance and high-voltage tests specified in Section 10 of IEC 60598-1.

NOTE A flexing is one movement, either backwards or forwards.

8.11.5 For rewirable handlamps, the test of 5.2.10.3 of Section 5 of IEC 60598-1 is made without a cord guard, gland or similar device in position. Non-rewirable handlamps are tested as delivered.

Glands shall not be used as cord anchorage.

Compliance shall be checked by inspection.

8.11.6 Non-detachable flexible cables and cords shall have a length of at least 5 m.

Compliance shall be checked by measuring the length of the cable or cord between the point where the cable or cord, or cord guard, enters the handlamp, and the entry to the plug.

8.12 Protection against electric shock

The provisions of Section 8 of IEC 60598-1 apply, together with the requirements of 8.12.1.

8.12.1 It shall not be possible to remove by hand parts which prevent contact with ES or BC lamp caps.

For handlamps with tungsten filament lamps, when protection against electric shock is checked the protective grid and the protective glass are removed unless they are integral with the body of the handlamp.

Compliance shall be checked by inspection and by manual test.

8.13 Endurance tests and thermal tests

The provisions of Section 12 of IEC 60598-1 apply, together with the requirements of 8.13.1 to 8.13.3.

8.13.1 For handlamps and ballasts with external parts the deterioration of which impairs the safety of the handlamp, compliance shall be checked by the following endurance test in addition to the test of 12.3.1 of Section 12 of IEC 60598-1.

Luminaires with an IP classification greater than IP20 shall be subjected to the relevant tests of 12.4, 12.5, 12.6 and 12.7 of Section 12 of IEC 60598-1 after the test(s) of 9.2 but before the test(s) of 9.3 of Section 9 of IEC 60598-1 specified in 8.14 of this document.

Rubber handlamps and rubber cases of independent ballasts are aged in an atmosphere having the composition and pressure of the ambient air, by suspending them freely in a heating cabinet, ventilated by natural circulation.

The sample is kept in the cabinet for 10 days (240 h) at a temperature of $70\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ or at a temperature which is $30\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ in excess of the highest temperature obtained for the rubber during the test of 12.4.1 of Section 12 of IEC 60598-1, whichever is the higher.

During the test, the rubber parts shall not undergo any change which could cause the handlamp to become unsafe.

After the above test, the luminaire shall withstand an electric strength test as specified in 10.2.2 of IEC 60598-1, but with the test voltage reduced by 500 V.

This test is made on a separate sample.

The use of an electrically heated cabinet is recommended. Natural circulation may be provided by holes in the wall of the cabinet.

8.13.2 The thermal tests representing normal operation and abnormal operation, of 12.4 and 12.5 of Section 12 of IEC 60598-1, are made with the handlamp and independent ballast, if any, either placed on a dull black painted wooden floor or suspended so that they rest against a dull black painted wooded wall, whichever is the more unfavourable.

According to this requirement, the ballast, if any, is not tested within a test hood.

8.13.3 The limiting temperature of 70 °C for natural rubber in Table 12.2 of Section 12 of IEC 60598-1 does not apply to non-protective parts. The test of 8.13.1 is sufficient.

8.14 Resistance to dust and moisture

The provisions of Section 9 of IEC 60598-1 apply, together with the requirements of 8.14.1.

For luminaires with an IP classification greater than IP20, the order of the tests specified in Section 9 of IEC 60598-1 shall be as specified in 8.13 of this document.

8.14.1 Protective glasses, translucent covers and similar parts are removed before the humidity treatment, even if their removal requires the use of a tool, unless they are integral with the body of the handlamp.

8.15 Insulation resistance and electric strength

The provisions of Section 10 of IEC 60598-1 apply.

8.16 Resistance to heat, fire and tracking

The provisions of Section 13 of IEC 60598-1 apply, together with the requirements of 8.16.1.

8.16.1 For handlamps having a handle or shell of flexible material, such as rubber or polychloroprene, compliance shall be checked by the following test.

The parts of the handlamp which are gripped in normal use are subjected to a pressure test in an apparatus similar to that shown in Figure 3, the test being made in a heating cabinet maintained at a temperature of $100\text{ °C} \pm 2\text{ °C}$.

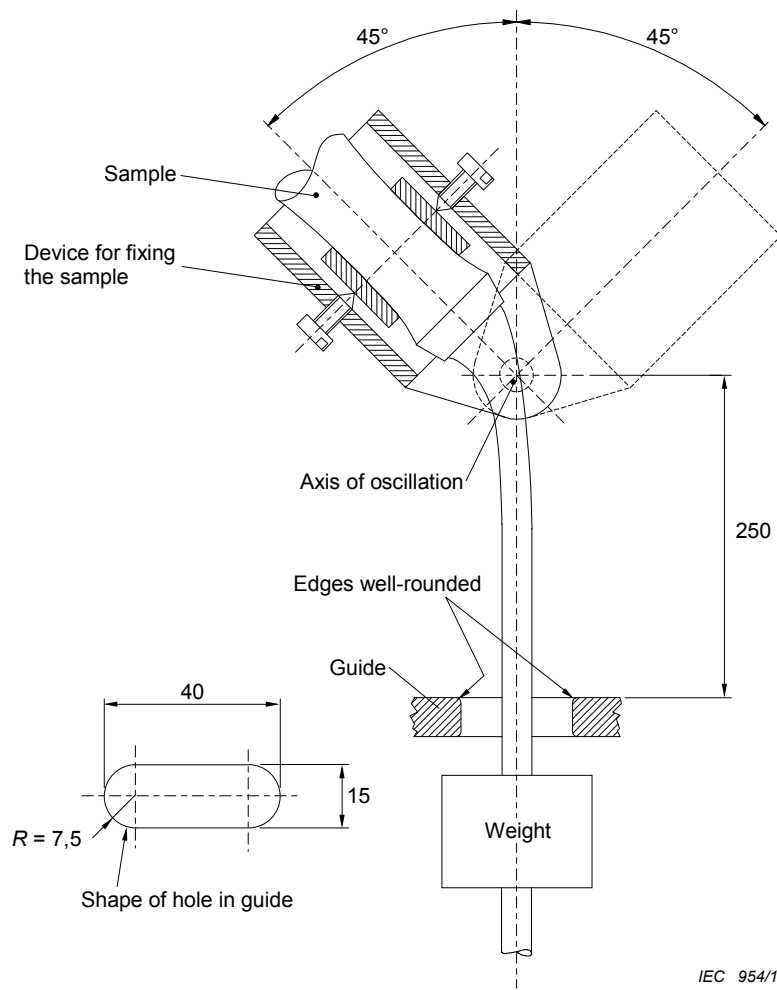
The sample is clamped between steel jaws, having a cylindrical face of 25 mm radius, a width of 15 mm and a length of 50 mm. The corners are rounded with a radius of 2,5 mm.

The sample is clamped in such a way that the jaws press against it in the area where it is gripped in normal use, the centre line of the jaws coinciding as nearly as possible with the centre of this area.

The force applied through the jaws is 100 N.

After 1 h, the jaws are removed and the sample shall show no damage.

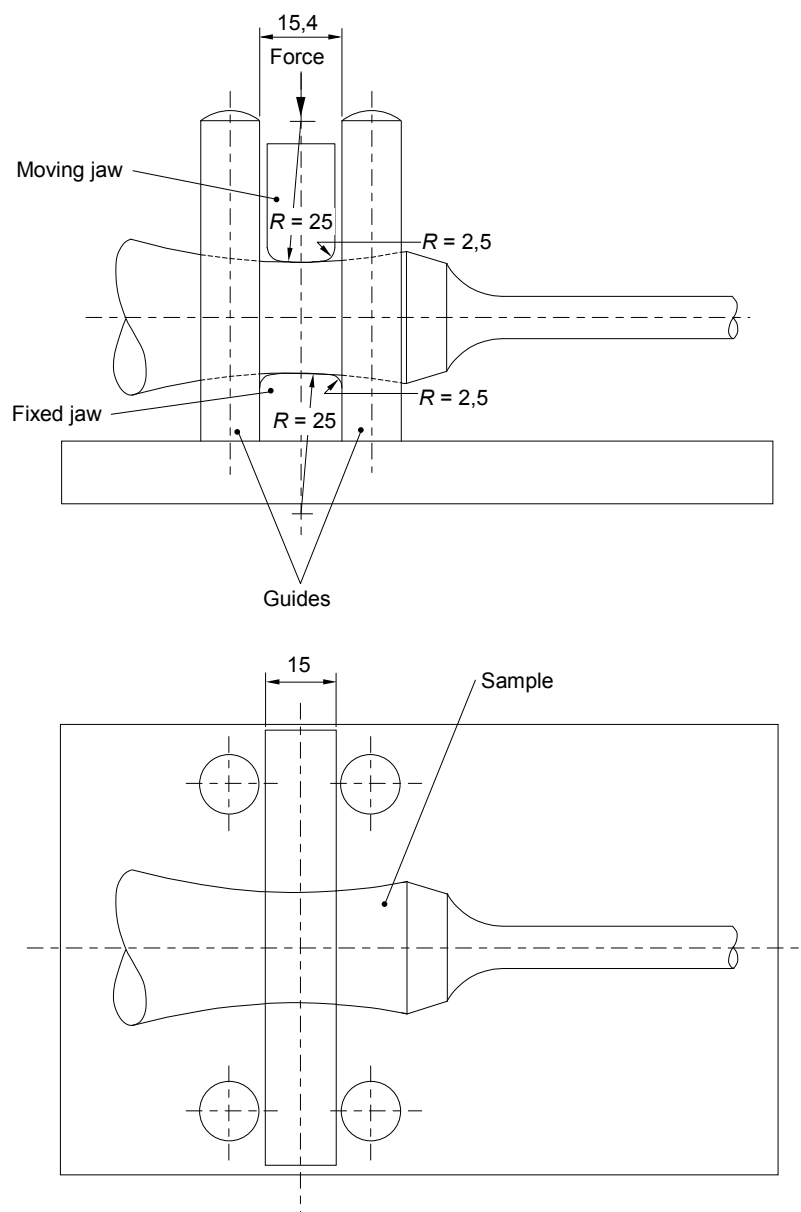
NOTE In Australia and New Zealand, additional test requirements apply. Refer to the regional standard.



IEC 954/13

Dimensions in millimetres

Figure 2 – Apparatus for flexing test



IEC 955/13

Dimensions in millimetres

Figure 3 – Crush test apparatus

[\(Continued from second cover\)](#)

The committee has reviewed the provision of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
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

Only English language text has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the International Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website- www.bis.gov.in or www.standardsbis.in.

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