

Specification for

Insulator and conductor fittings for overhead power lines —

**Part 4: Locking devices for ball and
socket couplings of string insulator
units: dimensions and tests**

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- Association of Consulting Engineers
- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)
- British Cable Makers' Confederation
- British Ceramic Research Ltd.
- British Industrial Ceramic Manufacturers' Association
- Department of Energy (Electricity Division)
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- Transmission and Distribution Association (BEAMA Ltd.)

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Aluminium Federation
- British Railways Board
- Electricity Supply Industry in England and Wales
- National Association of Malleable Ironfounders
- Overhead Transmission Line Contractors

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Foreword

This Part of BS 3288 has been prepared under the direction of the Power Electrical Engineering Standards Committee. It is technically equivalent to IEC 372:1984, published by the International Electrotechnical Commission (IEC), except that the more compact British design of the size 28 coupling has been added as size 28B.

It is not envisaged that split-pins will be used in 28B couplings and the dimensions of the corresponding holes have not been included.

Apart from some essential editorial changes and the addition referred to above, the text of the IEC Publication is unchanged to facilitate future alignment with prospective CENELEC harmonization of IEC 372. For ease of production the text of the IEC publication has been used. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

Where reference is made to items subject to agreement, this should be taken to indicate that the subject matter concerned is not inherently part of the requirements of the standard, but should be included in the purchase contract. Similarly, where a quantity is to be specified by the purchaser, e.g. the last paragraph of clause 5, it should be included in the purchase contract.

Where the prescriptive “shall” is used in a note, e.g. in the note to 8.2, the statement is to be regarded as a requirement.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This standard is applicable to locking devices used with ball and socket couplings of string insulator units and used with the corresponding metal fittings standardized in BS 3288-3 when they are supplied separately.

When these locking devices are supplied with an insulator or fitting, they shall be considered as an integral part of it. In this case, the relevant tests shall be included with those of insulators, as specified in BS 137-1. On request, a certificate shall be delivered confirming that the tests on locking devices as specified in this standard have been carried out. The locking devices are usually supplied with the insulators or corresponding metal fittings.

2 Object

The object of this standard is:

- to define the shapes and some standard dimensions for locking devices;
- to define the test methods for locking devices;
- to state the acceptance conditions for supply;
- to give other dimensions for guidance of manufacturing only.

The object of this standard does not include the specification of the nature of the material, but it is recommended that this material does not have a surface coating for corrosion protection. Moreover, the material shall not give rise to significant contact corrosion (chemical reaction) between the locking device and the ball and socket coupling.

3 Plan of the standard

The main part of this standard consists of the two following sections:

3.1 Section 2. Dimensions and general rules

Two types of locking devices are standardized, one using a split-pin, the other a W-shaped clip.

The first type requires a circular hole and the second a rectangular hole.

Two split-pins are proposed:

- *standard split-pin*: this split-pin is a tight-fit in the socket-hole;
- *alternative split-pin*: this split-pin is a loose fit in the socket-hole.

NOTE 1 This alternative may be used by agreement between the manufacturer and the purchaser when the problems of stress corrosion are possible for the split-pin metal due to the permanent stress in the tight-fit system, e.g. when certain types of stainless steel are used.

The socket-hole into which the locking device fits is the same for both the standard and alternative split-pins, so it is possible to use the alternative split-pin in a socket designed for the standard split-pin.

See Clauses 5 and 6 for dimensions concerning split-pins.

See Clause 7 for dimensions concerning W-clips.

NOTE 2 There are two alternative designs for the 28 mm ball and socket coupling. The one adopted by IEC is listed in this standard as “28”, the more compact British design is listed as “28B”. The 28B coupling is available only with a W-clip.

3.2 Section 3. Tests

The tests for locking devices are:

- visual examination;
- checking of dimensions;
- verification of resistance to bending;
- hardness test;
- corrosion resistance test (in some cases).

Section 2. Dimensions and general rules

4 Shape of the locking device

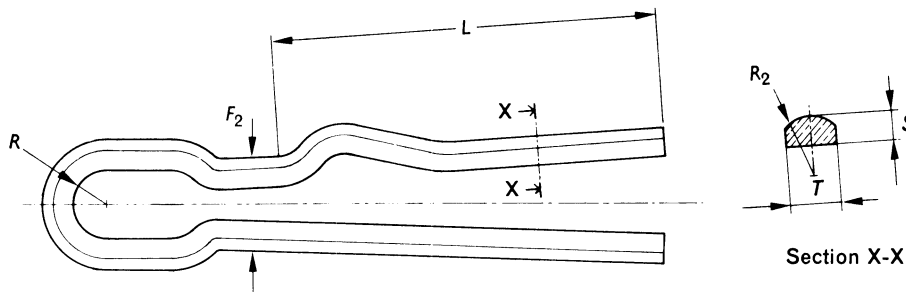
4.1 Split-pin

One of the legs of the split-pin has a hump and the free ends are bent outwards after insertion into the socket. These features provide two distinct positions for the split-pin when operated for locking and coupling, and complete withdrawal from the socket is effectively prevented (see Clause 8).

4.2 W-clip

The W-clip is so shaped that it will remain in two distinct positions when operated for coupling and locking. The shape of the W-clip is such that complete withdrawal from the socket when moving from the locking to the coupling position is prevented (see Clause 8).

5 Standard dimensions of the split-pins (standard and alternative type)



All dimensions are given in millimetres.

Standard couplings	Standard split-pins						Alternative split-pins ^a
	S	T	R ₂	F ₂ min	R _{min}	L _{min}	F' ₂ max
11	2,2 ± 0,1	4,8 ^{+0,2} ₀	3,3	8,2	2,5	29	7,3
16A	3,2 ± 0,1	5,5 ^{+0,2} ₀	3,8	10,3	3	38	9,2
16B	3,2 ± 0,1	7,9 ^{+0,2} ₀	4,8	10,7	3	38	9,7
20	3,2 ± 0,1	7,0 ^{+0,2} ₀	4,8	10,7	3	49	9,7
24	4,0 ± 0,1	8,7 ^{+0,2} ₀	5,7	12,8	3,5	60	11,7
28 ^b	4,5 ± 0,1	10,0 ^{+0,3} ₀	6,2	13,8	3,5	71	12,7
32	5,2 ± 0,1	11,5 ^{+0,3} ₀	7,2	15,8	3,5	81	14,7

^a All the dimensions are the same as for standard split-pins, except the value F₂ replaced by F'₂.
^b See Note 2 of Sub-clause 3.1.

The dimension L_{max} shall be specified by the purchaser of the split-pin (see Sub-clause 13.1.1.)