

This is a preview of "BS 3288-2:2009". Click here to purchase the full version from the ANSI store.

BS 3288-2:2009



BSI British Standards

Insulator and conductor fittings for overhead power lines

Part 2: Specification for a range of insulator fittings

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

BSI
British Standards

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

The BSI copyright notice displayed in this document indicates when the document was last issued.

© BSI 2009

ISBN 978 0 580 57769 7

ICS 29.120.20, 29.240.20

The following BSI references relate to the work on this standard:

Committee reference PEL/11

Draft for comment 08/30156903 DC

Publication history

First published May 1965

Second edition, January 1977

Third edition, April 1990

Fourth (present) edition, May 2009

Amendments issued since publication

Date	Text affected
-------------	----------------------

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

Foreword v

1	Scope	1
2	Normative references	1
3	Performance and general requirements	1
4	Dimensions and tolerances	2
5	Galvanizing	2
6	Insulator pins	2
7	Line post insulator studs	3
8	Insulator set fittings	4
9	Suspension clamps and termination fittings	5
	General notes on figures and tables	5

Annexes

Annex A (informative)	List of insulator set fittings	87
Annex B (informative)	List of insulator set fittings in order of reference number	88

List of figures

Figure 1	– Dimensions of small steel insulator pin head	6
Figure 2	– Dimensions of large steel insulator pin head	6
Figure 3	– Insulator pin with small steel head: reference number 23	7
Figure 4	– Insulator pin with large steel head	8
Figure 5	– Pilot insulator pin	9
Figure 6	– Ring gauge for head of insulator pin	10
Figure 7	– Shackle: reference numbers 15/29A, 28/29A, 42/29A, 42/103, 67/103A, 15/129A, 42/129A and 28/108A	11
Figure 8	– Shackle: reference number 15/33A	12
Figure 9	– Shackle: reference numbers 28/34A, 42/34A and 67/34A	13
Figure 10	– Ball-ended hook: reference number 4/88	14
Figure 11	– Ball-ended hook (with arcing horn attachment): reference number 15/32	15
Figure 12	– Ball-ended hook: reference number 15/81	15
Figure 13	– Ball-ended eye link (with arcing horn attachment): reference numbers 15/30, 28/30 and 42/30	16
Figure 14	– Ball-ended eye link: reference number 15/82	17
Figure 15	– Twisted ball-ended eye link (with arcing horn attachment): reference number 42/44	18
Figure 16	– Ball clevis: reference numbers 15/83A, 28/83A and 84/83A	19
Figure 17	– Ball clevis (with arcing horn attachment): reference number 15/25A	20
Figure 18	– Ball clevis (with arcing horn attachment): reference numbers 67/25A and 84/25A	21
Figure 19	– Ball tongue (with arcing horn attachment): reference numbers 67/48 and 84/48	22
Figure 20	– Socket clevis: reference numbers 15/84A, 28/37A, 42/37A, 42/46A, 42/104A and 84/37A	23
Figure 21	– Socket clevis (with arcing horn attachment): reference numbers 15/31A, 28/31A and 42/31A	24
Figure 22	– Socket clevis (with arcing horn attachment): reference number 42/45A	25

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

number 67/31A	26
Figure 24 – Socket clevis (with arcing horn attachment): reference number 84/31A	27
Figure 25 – Twisted socket-clevis (with arcing horn attachment): reference number 28/131A	28
Figure 26 – Socket tongue (with arcing horn attachment): reference numbers 15/35, 28/36A, 28/36B, 28/36C, 28/135, 42/35 and 42/36	29
Figure 27 – Socket tongue (with arcing horn attachment): reference number 42/51	30
Figure 28 – Socket tongue: reference number 15/85	31
Figure 29 – Socket thimble: reference number 15/60	31
Figure 30 – Socket thimble: reference number 15/61	32
Figure 31 – Clevis tongue: reference number 28/28A	33
Figure 32 – Clevis tongue: reference numbers 42/28AA, 42/28B and 42/28CA	34
Figure 33 – Clevis tongue: reference numbers 42/39AA, 42/39BA, 42/54A, 42/54B and 42/139A	35
Figure 34 – Earthwire adaptor: reference number 28/50A	36
Figure 35 – Earthwire adaptor: reference number 28/40A	37
Figure 36 – Twisted clevis-tongue: reference numbers 42/27A, 67/27A and 84/27A	38
Figure 37 – Twisted clevis-clevis: reference numbers 15/23A, 28/23A, 67/23A and 84/23A	39
Figure 38 – Twisted clevis-clevis: reference number 28/24A	40
Figure 39 – Twisted clevis-clevis: reference number 42/23A	41
Figure 40 – Adaptor: reference numbers 15/27B, 15/27C, 15/27D, 28/27B, 28/27C and 28/47	42
Figure 41 – Terminating strap: reference numbers 4/89A and 4/89B	43
Figure 42 – Strap section and terminal: reference number 4/90	44
Figure 43 – Single link: reference numbers 15/86, 28/86, 42/86 and 67/86	45
Figure 44 – Single conversion link: reference number 42/115	45
Figure 45 – Parallel links: reference numbers 15/88A, 28/88A, 42/88AA, 42/88BA, 42/88CA, 67/88A and 84/88A	46
Figure 46 – Parallel conversion links: reference numbers 28/89A, 42/89A and 67/89A	47
Figure 47 – Cranked links: reference numbers 15/87A, 28/87A, 42/87A and 67/87A	48
Figure 48 – Cranked links: reference numbers 42/102A and 84/102A	49
Figure 49 – Cranked links: reference number 28/186A	50
Figure 50 – Cranked links: reference number 28/187A	51
Figure 51 – Cranked links: reference number 28/188A	52
Figure 52 – Cranked links: reference number 28/189A	53
Figure 53 – Landing plate: reference numbers 15/21, 28/21 and 42/21	54
Figure 54 – Sag adjuster plate: reference number 15/101	55
Figure 55 – Sag adjuster plate: reference number 28/100	56
Figure 56 – Sag adjuster plate: reference number 42/100	57
Figure 57 – Sag adjuster plate: reference number 42/101	58
Figure 58 – Sag adjuster plate: reference number 67/100	59
Figure 59 – Sag adjuster plate: reference number 67/101	60
Figure 60 – Sag adjuster plate: reference number 67/110A	61
Figure 61 – Sag adjuster plate: reference number 84/100	62
Figure 62 – Sag adjuster plate: reference number 84/101	63
Figure 63 – Sag adjuster plate: reference number 84/110	64
Figure 64 – Yoke plate: reference number 15/22	65

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

Figure 66 – Yoke plate: reference numbers 67/40 and 67/41	66
Figure 67 – Yoke plate: reference number 67/42	66
Figure 68 – Yoke plate: reference numbers 28/22A, 42/22A and 42/124A	67
Figure 69 – Yoke plate: reference number 28/43	68
Figure 70 – Yoke plate: reference number 84/40	69
Figure 71 – Yoke plate: reference number 84/41	69
Figure 72 – Yoke plate: reference number 84/42	70
Figure 73 – Yoke plate: reference numbers 42/42 and 42/106	71
Figure 74 – Yoke plate: reference number 84/52	72
Figure 75 – Yoke plate: reference numbers 67/53A and 84/53	73
Figure 76 – Cruciform yoke plate: reference number 84/38C	74
Figure 77 – Suspension clamp body with keeper for line and earth conductors: illustrated with closed type straps	75
Figure 78 – Suspension clamp body with keeper for line and earth conductors: corona free type: illustrated with open type straps	76
Figure 79 – 190 kN sag adjuster assemblies: Type L and Type M	77
Figure 80 – 300 kN sag adjuster assembly	78
Figure 81 – Alternative 300 kN sag adjuster assembly	79
Figure 82 – 400 kN sag adjuster assembly	80
Figure 83 – Alternative 400 kN sag adjuster assembly	81
Figure 84 – Sag adjuster/shackle pins H, L and M complete with washers and split pins	82
Figure 85 – Sag adjuster jack locating pin 300 kN and 400 kN complete with nut and split pins	83
Figure 86 – Sag adjuster pin J complete with washer and split pin	84
Figure 87 – Sag adjuster bolt/pin P, Q, R and S complete with washer and split pin	84
Figure 88 – Spacer for sag adjuster bolt/pin R and S and jack locating pins 300 kN and 400 kN	85
Figure 89 – Typical arcing horn flags	85
Figure 90 – Clevis pin and split pin	86
Figure 91 – Hex. bolt and split pin	86

List of tables

Table 1 – Insulator pins	3
Table 2 – Dimensions of insulator pin with large steel head	8
Table 3 – Details of pilot insulator pin	9
Table 4 – Dimensions of ring gauge for head of insulator pin	10
Table 5 – Dimensions of bow shackle: reference numbers 15/29A, 28/29A, 42/29A, 42/103, 67/103A, 15/129A and 42/129A	11
Table 6 – Dimensions of "D" shackle: reference number 28/108A	11
Table 7 – Dimensions of shackle: reference numbers 28/34A, 42/34A and 67/34A	13
Table 8 – Dimensions of ball-ended eye link (with arcing horn attachment): reference numbers 15/30, 28/30 and 42/30	16
Table 9 – Dimensions of ball clevis: reference numbers 15/83A, 28/83A and 84/83A	19
Table 10 – Dimensions of ball clevis (with arcing horn attachment): reference numbers 67/25A and 84/25A	21
Table 11 – Dimensions of ball tongue (with arcing horn attachment): reference numbers 67/48 and 84/48	22
Table 12 – Dimensions of socket clevis: reference numbers 15/84A, 28/37A, 42/37A, 42/46A, 42/104A and 84/37A	23
Table 13 – Dimensions of socket clevis (with arcing horn attachment): reference numbers 15/31A, 28/31A and 42/31A	24

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

attachment): reference numbers 15/35, 28/36A, 28/36B, 28/36C, 28/135, 42/35 and 42/36	29
Table 15 – Dimensions of clevis tongue: reference numbers 42/28AA, 42/28B and 42/28CA	34
Table 16 – Dimensions of clevis tongue: reference numbers 42/39AA, 42/39BA, 42/54A, 42/54B and 42/139A	35
Table 17 – Dimensions of twisted clevis-tongue: reference numbers 42/27A, 67/27A and 84/27A	38
Table 18 – Dimensions of twisted clevis-clevis: reference numbers 15/23A, 28/23A, 67/23A and 84/23A	39
Table 19 – Dimensions of adaptor: reference numbers 15/27B, 15/27C, 15/27D, 28/27B, 28/27C and 28/47	42
Table 20 – Dimensions of terminating strap: reference numbers 4/89A and 4/89B	43
Table 21 – Dimensions of single link: reference numbers 15/86, 28/86, 42/86 and 67/86	45
Table 22 – Dimensions of parallel links: reference numbers 15/88A, 28/88A, 42/88AA, 42/88BA, 42/88CA, 67/88A and 84/88A	46
Table 23 – Dimensions of parallel conversion links: reference numbers 28/89A, 42/89A and 67/89A	47
Table 24 – Dimensions of cranked links: reference numbers 15/87A, 28/87A, 42/87A and 67/87A	48
Table 25 – Dimensions of cranked links: reference numbers 42/102A and 84/102A	49
Table 26 – Dimensions of landing plate: reference numbers 15/21, 28/21 and 42/21	54
Table 27 – Dimensions of yoke plate: reference numbers 67/40 and 67/41	66
Table 28 – Dimensions of yoke plate: reference numbers 28/22A, 42/22A and 42/124A	67
Table 29 – Dimensions of yoke plate: reference numbers 42/42 and 42/106	71
Table 30 – Dimensions of yoke plate: reference numbers 67/53A and 84/53	73
Table 31 – Dimensions of suspension clamp body with keeper for line and earth conductors: closed type straps	75
Table 32 – Dimensions of suspension clamp body with keeper for line and earth conductors: corona free type: open type straps	76
Table 33 – Dimensions of sag adjuster/shackle pins H, L and M complete with washers and split pins	82
Table 34 – Dimensions of sag adjuster jack location pin 300kN and 400 kN complete with nut and split pins	83
Table 35 – Dimensions of sag adjuster bolt/pin P, Q, R and S	84
Table 36 – Dimensions of spacer for sag adjuster bolt/pin R and S	85
Table 37 – Dimensions of spacer for jack locating pin 300 kN and 400 kN	85
Table 38 – Dimensions of clevis pin and split pin	86
Table 39 – Dimensions of bolt and split pin	86

Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 88, an inside back cover and a back cover.

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

Publishing information

This part of BS 3288 is published by BSI and came into effect on 31 May 2009. It was prepared by Technical Committee PEL/11, *Overhead lines*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 3288 supersedes BS 3288-2:1990, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes.

- Errors in figures and tables identified in the previous edition have been corrected and proposed amendments where appropriate included.
- Where fittings were previously shown with a clevis pin, washer and split pin, a hex. bolt, nut and split pin is now shown in accordance with the current UK industry preferred practice, and the suffix "A" has been added to the reference number. The option of using a clevis pin, washer and split pin has, however, been retained.
- A number of new insulator fittings that are in common use have been included, for example; 70 kN socket thimbles, 70 kN and 125 kN cranked/parallel links, 300 kN and 400 kN ball-clevis/clevis-tongue fittings, 190 kN and 300 kN yoke plates, 300 kN and 400 kN sag adjuster sets. Some insulator fittings that have become obsolete, or have limited use, have been excluded.

NOTE This standard sets out to cover the more common insulator fittings in use. It is not practical to include every type of insulator fitting as the range is too extensive.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

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.

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

This is a preview of "BS 3288-2:2009". [Click here to purchase the full version from the ANSI store.](#)

This part of BS 3288 specifies requirements for a range of insulator fittings for overhead power lines and also includes typical suspension clamps for conductors.

The dimensions are given in Figures 1 to 91 and Tables 1 to 39.

2 Normative references

The following referenced documents are indispensable for the application 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.

BS 916, *Specification for black bolts, screws and nuts, hexagon and square, with B.S.W. threads and partly machined bolts, screws and nuts, hexagon and square, with B.S.W. or B.S.F. threads*¹⁾

BS 1574, *Specification for split pins (inch series)*

BS 3288-1, *Insulator and conductor fittings for overhead power lines – Part 1: Performance and general requirements*¹⁾

BS 3643-2, *ISO metric screw threads – Part 2: Specification for selected limits of size*

BS 4190, *ISO metric black hexagon bolts, screws and nuts – Specification*

BS 4320, *Specification for metal washers for general engineering purposes – Metric series*

BS EN 60372, *Locking devices for ball and socket couplings of string insulator units – Dimensions and tests*

BS EN 61284, *Overhead lines – Requirements and tests for fittings*

BS EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles – Specifications and test methods*

BS EN ISO 3651-2, *Determination of resistance to intergranular corrosion of stainless steels – Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels – Corrosion test in media containing sulfuric acid*

IEC 60120, *Dimensions of ball and socket couplings of string insulator units*

3 Performance and general requirements

The fittings shall conform to the appropriate requirements of BS EN 61284.

¹⁾ Obsolescent.