BRITISH STANDARD

BS 91:1998

Electric cable soldering sockets — Specification

ICS 29.120.20

Committees responsible for this British Standard

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Association of Consulting Engineers
BEAMA Electrical Cable and Conductor Accessory Manufacturers' Association
British Approvals Service for Cables
British Cable Makers Confederation
British Iron and Steel Producers' Association
British Plastics Federation
Department of Trade and Industry (Consumer Safety Unit, CA Division)
Electricity Association
Electrical Contractors' Association
Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
ERA Technology Ltd.
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Foreword

This British Standard has been prepared by Subcommittee GEL/20/7. It supersedes BS 91:1973 which is withdrawn.

This edition updates references and includes technical changes to bring the standard up to date, but it does not reflect a full revision.

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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 5 and a back cover.

1 Scope

This British Standard specifies requirements for electric cable soldering sockets of copper or copper alloy for connecting to each other or to apparatus. It specifies material for and dimensions of sockets suitable for cables containing conductors from 6 mm^2 up to and including 1200 mm^2 cross-sectional area in accordance with BS 6360, Tables 1 and 2.

The sockets are also suitable for use with flexible conductors which conform to the requirements of BS 6360, Tables 3 and 4. However, some such conductors will require a socket one size larger than conductors of the same nominal cross-sectional area but which conform to the requirements of Table 2 of BS 6360.

The sockets are not intended for use with sector-shaped solid aluminium conductors.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 1400, *Specification for copper alloy ingots and copper alloy and high conductivity copper castings.*

BS 1872, *Specification for electroplated coatings of tin.*

BS 2872, *Specification for copper and copper alloy forging stock and forgings.*

BS 6360:1991, *Specification for conductors in insulated cables and cords.*

BS EN 20273, *Fasteners. Clearance holes for bolts and screws.*

BS EN 29453, *Soft solder alloys. Chemical compositions and forms.*

IEC 60028, *International standard of resistance for copper.*

3 Definition

For the purposes of this British Standard, the following definition shall apply.

3.1

soldering socket

socket into which the conductor of an electric cable can be soldered and which is of suitable shape externally for making connection between the cable and other parts of the circuit by means of a bolt or stud

NOTE Sockets may be classed as forged or cast sockets or as tubular sockets.

4 Material for forged or cast cable sockets

Cast cable sockets shall be manufactured from brass conforming to the requirements of BS 1400. Forged sockets shall be manufactured from brass conforming to the requirements of BS 2872.

5 Material for tubular cable sockets

Tubular cable sockets shall be made from solid-drawn copper tubing having a conductivity of not less than 80 % of the internationally accepted standard value for annealed high conductivity copper (100 % IACS)[1].

6 Dimensions of forged or cast cable sockets

The dimensions of each size of forged or cast cable socket shall be in accordance with Figure 1 and Table 1, with permissible tolerances as follows:

	Tolerance
Dimension *A* up to 5 mm diameter	±5 %
Dimension *A* over 5 mm up to and including 30 mm diameter	±2½ %
Dimension *A* over 30 mm diameter	±1 %
Dimension *E*	BS EN 20273 medium series
Dimensions *B*, *C*, *D*, *F*, *H*, *J*, *X* and *Y*	−5 % except socket 1C for which the value is −10 %

7 Dimensions of tubular cable sockets

The dimensions of each size of tubular cable socket shall be in accordance with Figure 2 and Table 2, with permissible tolerances as follows:

	Tolerance
Dimensions *A* and *C*, sockets of outside diameter (*C*) up to and including 16 mm	±0.1 mm
Dimensions *A* and *C*, sockets of outside diameter (*C*) over 16 mm up to and including 25 mm	±0.12 mm
Dimensions *A* and *C*, sockets of outside diameter (*C* over 25 mm up to and including 50 mm	±0.15 mm
Dimension *E*	BS EN 20273 medium series
Dimensions *B*, *D*, *F*, *G*, *H*, *J* and *K*	−5 %

[1] Copper having a resistivity of 0.017 241 μΩ·m is said to have a conductivity of 100 % IACS (see IEC Publication 60028).

8 Finish of cable sockets

8.1 Forged and cast sockets shall be plain or tinned on both interior and exterior surfaces with a hot dip tin finish.

The interior and exterior surfaces of tubular cable sockets shall be tinned either by electroplating in accordance with BS 1872 classification number Sn 2C, or by hot dip tinning.

The solder used for hot dip tinning shall be "Alloy designation 5" as specified in BS EN 29453, and the flux used for the purpose of tinning shall be non-corrosive.

The average thickness of tin coating shall be not less than 10 μm and the coating shall be such as to ensure efficient soldering without further cleaning.

8.2 The stud hole in the palm of the forged or cast cable socket shall, unless otherwise specified, have a nominal diameter, dimension *E*, corresponding to the appropriate size of standard stud as specified in column 5 of Table 1. In no case shall the stud hole have a nominal diameter exceeding the value of dimension *E*, corresponding to the appropriate largest stud size as specified in column 5 of Table 1. The stud hole shall be free from burrs.

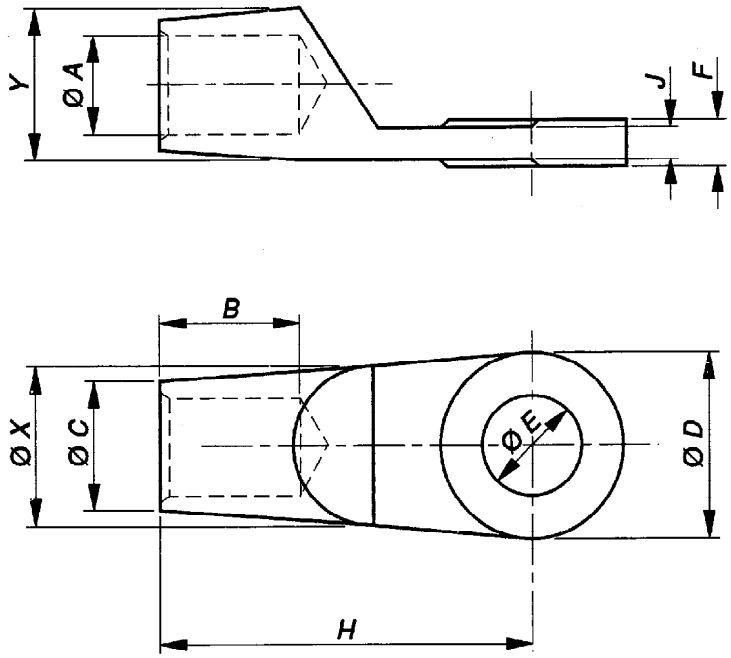
8.3 The stud hole in the palm of the tubular cable socket shall, unless otherwise specified, have a nominal diameter, dimension *E*, corresponding to the appropriate size of standard stud in column 5 of Table 2. In no case shall the stud hole have a nominal diameter exceeding the value of dimension *E* corresponding to the appropriate largest stud size in column 5 of Table 2. The stud hole shall be free from burrs.

8.4 The faces on each side of the palm, whether forged, cast or tubular, shall be sufficiently parallel and flat as to provide a suitable contact surface.

NOTE A filling hole may be provided in the barrel of the socket by agreement between the purchaser and the supplier.

9 Marking of cable sockets

All cable sockets shall be marked with the socket reference number, e.g. 13C.



Type 1

NOTE For dimensions see Table 1.

Figure 1 — Forged cast cable sockets

Table 1 — Dimensions of forged or cast cable sockets

1	2	3	4	5				6	7	8	9	10	11	12	13	14
Reference number	Conductor size			Studs and stud holes				Maximum dimension unless otherwise stated								
				Stranded stud		Largest stud										
	Stranded[a] copper/ aluminium and flexible[b] copper mm²	Solid[c] circular aluminium mm²	Solid[c] circular sectoral aluminium mm²	Stud size	Dimension *E* nominal mm	Stud size	Dimension *E* nominal mm	*A* (nom.) mm	*B* mm	*C* mm	*D* mm	*F* mm	*H* mm	*J* mm	*X* mm	*Y* mm
1C	6	6	—	M6	6.6	M6	6.6	4.2	8.8	7.5	18.4	4.4	24	2.6	8.7	9.6
2C	10	10	—	M6	6.6	M8	9.0	5.0	10.9	9.2	18.4	5.0	27	3.3	11.7	12.6
3C	16	16	—	M6	6.6	M8	9.0	6.0	10.9	9.2	18.4	5.0	27	3.3	11.7	12.6
4C	—	25	—	M8	9.0	M10	11.0	6.6	13.4	10.9	18.4	5.0	31	3.3	13.4	14.3
5C	25	35	—	M8	9.0	M12	13.5	7.7	13.4	10.9	18.4	5.0	31	3.3	13.4	14.3
6C	35	50	—	M8	9.0	M12	13.5	8.8	15.0	12.5	20.0	5.9	35	4.2	15.0	15.9
7C	50	70	—	M8	9.0	M12	13.5	10.0	15.0	12.5	20.0	5.9	35	4.2	15.0	15.9
8C	70	95	—	M8	9.0	M12	13.5	12.0	19.0	15.8	25.0	6.7	44	5.0	18.4	19.3
9C	95	120	—	M10	11.0	M12	13.5	14.0	22.5	18.4	28.0	7.5	49	5.8	22.0	22.9
10C	120	150	—	M10	11.0	M16	17.5	16.0	25.0	22.0	33.0	8.4	55	6.7	25.0	25.9
11C	150	185	—	M12	13.5	M20	22.0	17.5	30.0	27.0	37.0	10.0	65	8.3	32.0	32.9
12C	185	240	—	M16	17.5	M20	22.0	19.5	33.0	30.0	43.5	10.0	73	8.3	35.0	35.9
13C	240	300	—	M16	17.5	M20	22.0	22.5	33.0	30.0	43.5	10.0	73	8.3	35.0	35.9
14C	300	—	380	M16	17.5	M24	26.0	25.0	37.5	33.5	49.0	11.7	83	10.0	40.0	40.9
15C	400	—	480	M16	17.5	M24	26.0	28.0	46.0	39.0	49.0	13.4	94	11.7	43.0	43.9
16C	—	—	600	M16	17.5	M24	26.0	30.0	46.0	39.0	49.0	13.4	94	11.7	43.0	43.9
17C	500	—	—	M20	22.0	M24	26.0	31.5	46.0	39.0	49.0	13.4	94	11.7	43.0	43.9
18C	—	—	740	M20	22.0	M24	26.0	33.5	46.0	39.0	49.0	13.4	94	11.7	43.0	43.9
19C	630	—	—	M24	26.0	M30	33.0	35.5	53.0	44.0	62.0	15.0	110	13.3	52.0	52.9
20C	—	—	960	M24	26.0	M30	33.0	38.0	53.0	44.0	62.0	15.0	110	13.3	52.0	52.9
21C	800	—	—	M24	26.0	M30	33.0	40.5	55.0	52.0	62.0	17.0	120	15.0	58.0	59.0
22C	—	—	1 200	M24	26.0	M30	33.0	42.5	55.0	52.0	62.0	17.0	120	15.0	58.0	59.0
23C	1 000	—	—	M24	26.0	M36	39.0	45.0	62.0	64.0	70.0	17.0	130	15.0	67.0	68.0

[a] Stranded copper/aluminium conductors for single-core and multi-core cables conforming to BS 6360, Table 2.

[b] Flexible copper conductors for single-core and multi-core cables conforming to BS 6360, Tables 3 and 4. Some of the flexible conductors will require a socket one size larger than conductors of the same nominal cross-sectional area but conforming to BS 6360, Table 2.

[c] Solid circular conductors and circular sectoral conductors conforming to BS 6360, Table 1.

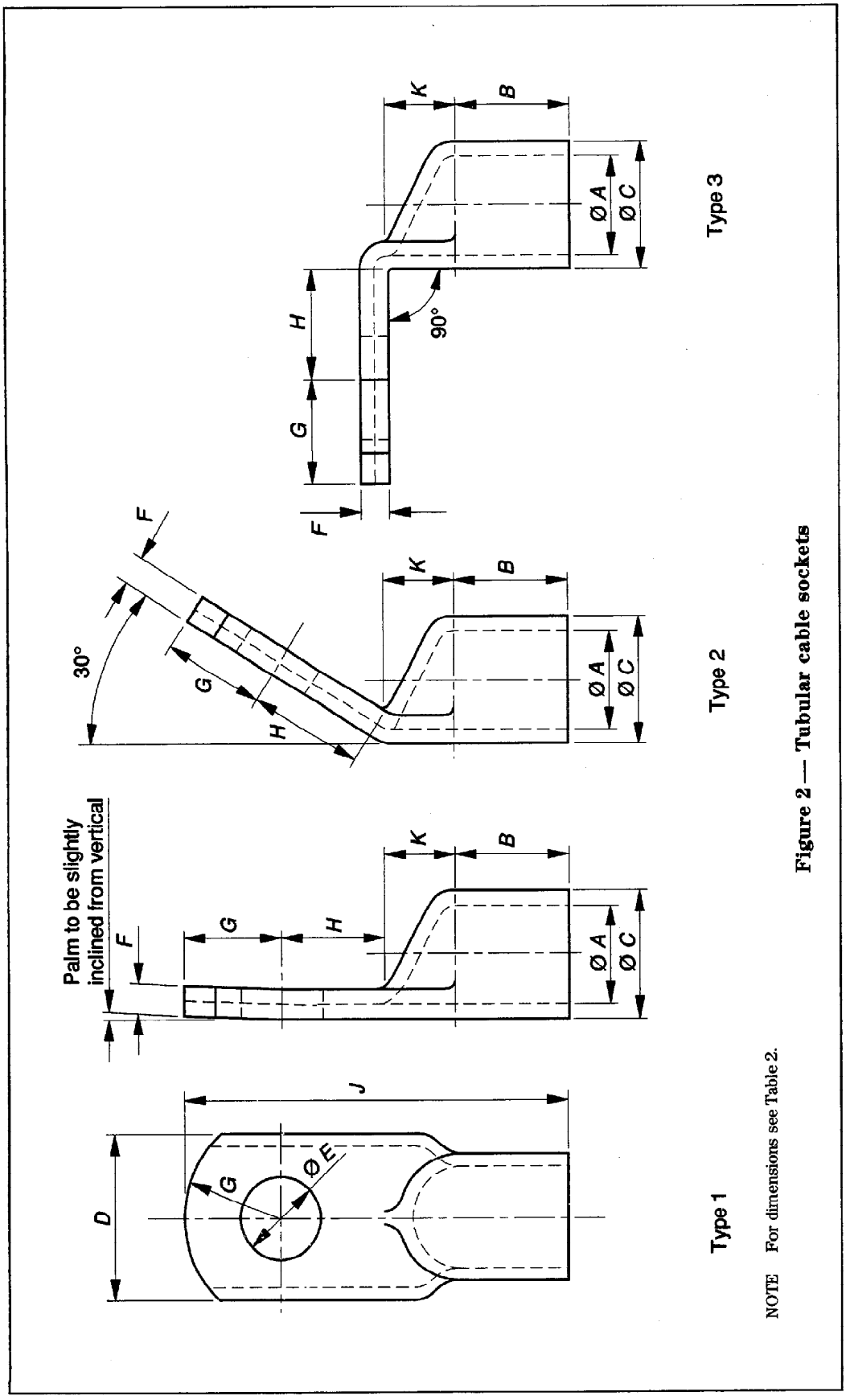


Figure 2 — Tubular cable sockets

NOTE For dimensions see Table 2.

Table 2 — Dimensions of tubular cable sockets

1	2		3		4		5				6	7	8	9	10	11	12	13	14
Reference number	**Conductor size**						**Studs and stud holes**				**Maximum dimension unless otherwise stated**								
	Stranded[a] copper/ aluminium and flexible[b] copper		**Solid[c] circular aluminium**		**Solid[c] circular sectoral aluminium**		**Standard stud**		**Largest stud**										
	min.	**max.**	**min.**	**max.**	**min.**	**max.**	**Stud size**	**Dimension *E* nominal**	**Stud size**	**Dimension *E* nominal**	*A* (nom.)	*B*	*C* (nom.)	*D*	*F*	*G*	*H*	*J*[d]	*K*
	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2		mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1T	—	6	6	10	—	—	M5	5.5	M5	5.5	4.4	9.5	6.0	8.5	1.6	5.0	6.0	24	3.5
2T	10	16	16	25	—	—	M6	6.6	M6	6.6	6.0	12.5	8.0	11.4	2.0	6.5	7.0	31	5.0
5T	—	25	—	35	—	—	M8	9.0	M10	11.0	7.6	12.5	10.0	14.4	2.4	10.5	12.0	41	6.0
6T	—	35	—	50	—	—	M8	9.0	M10	11.0	9.6	16.0	12.0	17.5	2.4	10.5	12.0	46	7.5
7T	50	70	70	95	—	—	M8	9.0	M12	13.5	11.9	20.0	16.6	23.4	4.7	12.7	14.3	56	9.5
9T	—	95	120	150	—	—	M10	11.0	M16	17.5	14.3	22.0	19.6	28.0	5.3	14.3	15.9	62	9.5
10T	—	120	—	185	—	—	M10	11.0	M20	22.0	16.7	28.0	22.6	34.0	5.9	17.5	20.6	78	11.1
11T	150	185	240	300	—	—	M12	13.5	M20	22.0	20.6	32.0	28.0	40.0	7.3	20.5	20.6	86	12.7
13T	—	240	—	—	—	380	M16	17.5	M24	26.0	23.8	38.0	31.0	45.0	7.3	24.0	23.8	100	14.3
14T	—	300	—	—	—	480	M16	17.5	M24	26.0	26.2	44.0	34.3	49.0	8.1	27.0	23.8	110	15.9
15T	400	500	—	—	600	740	M16	17.5	M24	26.0	31.8	48.0	41.0	59.0	9.2	30.0	25.4	121	17.5
19T	—	630	—	—	—	960	M24	26.0	M30	33.0	36.5	56.0	46.3	67.0	9.8	34.0	28.5	140	20.6

[a] Stranded copper/aluminium conductors for single-core and multi-core cables conforming to BS 6360, Table 2.

[b] Flexible copper conductors for single-core and multi-core cables conforming to BS 6360, Tables 3 and 4. Some of the flexible conductors will require a socket one size larger than conductors of the same nominal cross-sectional area but conforming to BS 6360, Table 2.

[c] Solid circular conductors and circular sectoral conductors conforming to BS 6360, Table 1.

[d] Not applicable to Types 2 and 3 of Figure 2.

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