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IS 3406-1 (1986): Dimensions for countersinks and counterbores, Part 1: Countersinks [PGD 20: Engineering Standards]



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Indian Standard

DIMENSIONS FOR
COUNTERSINKS AND COUNTERBORES

PART 1 COUNTERSINKS

(Second Revision)

1. Scope — Covers dimensions for countersinks for screws.

2. Type

2.1 Type A — For screws in accordance with:

- i) IS : 1365-1978 'Specification for slotted countersunk head screws (*third revision*)', in the diameter range 1 to 20 mm.
- ii) IS : 7485-1985 'Specification for cross recessed countersunk head screws (*first revision*)', in the diameter range 2.5 to 10 mm.
- iii) IS : 7486-1985 'Specification for cross recessed raised countersunk head screws (*first revision*)', in the diameter range 2.5 to 10 mm.
- iv) IS : 8911-1978 'Specification for slotted raised countersunk head screws', in the diameter range 1 to 20 mm.

2.2 Type B — For screws in accordance with IS : 6761-1972 'Specification for countersunk head screws with hexagon socket', in the diameter range 3 to 24 mm.

2.3 Type C — For screws in accordance with:

- i) IS : 7169-1974 'Specification for slotted raised countersunk (oval) head tapping screws,' in the size range 0 to 16 mm.
- ii) IS : 7170-1974 'Specification for slotted countersunk (flat) head tapping screws,' in the size range 10 to 16 mm.

2.4 Type E — For the bolts in accordance with IS : 8412-1977 'Specification for slotted countersunk head bolts for steel structures', in the diameter range 0 to 24 mm.

Note — Type A covers fine and medium series for precision and general engineering application, respectively.

Engineering Standards Sectional Committee, EDC 1 [Ref : Doc : EDC 1 (4365)]

Adopted 21 March 1986

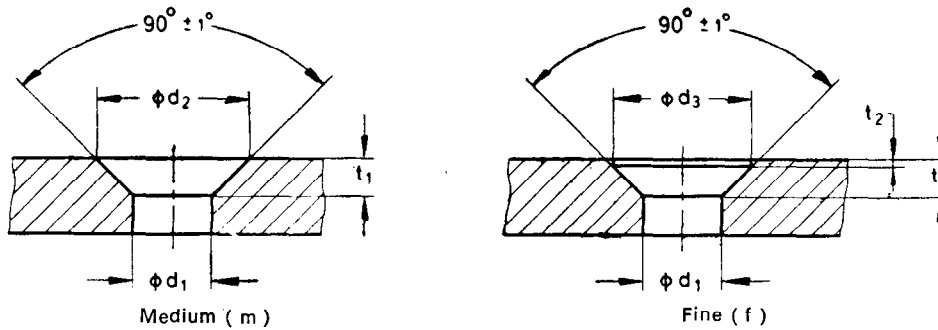
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3. Dimensions and Designation

3.1 Type A

3.1.1 Dimensions



All dimensions in millimetres.

For Nominal Size		1	1.2	(1.4)	1.6	(1.8)	2	2.5	3	(3.5)	4	(4.5)
Medium Series (m)	d_1 H13	1.2	1.4	1.6	1.8	2.1	2.4	2.9	3.4	3.9	4.5	5
	d_2 H13	2.4	2.8	3.3	3.7	4.1	4.6	5.7	6.5	7.6	8.6	9.5
	$t_1 \approx$	0.6	0.7	0.8	0.9	1	1.1	1.4	1.6	1.9	2.1	2.3
Fine Series (f)	d_1 H12	1.1	1.3	1.5	1.7	2	2.2	2.7	3.2	3.7	4.3	4.8
	d_3 H12	2	2.5	2.8	3.3	3.8	4.3	5	6	7	8	9
	$t_1 \approx$	0.7	0.8	0.9	1	1.2	1.2	1.5	1.7	2	2.2	2.4
	$t_2 +0.1$ 0	0.2	0.15	0.15	0.2	0.2	0.15	0.35	0.25	0.3	0.3	0.3

For Nominal Size		5	6	8	10	12	(14)	16	(18)	20
Medium Series (m)	d_1 H13	5.5	6.6	9	11	13.5	15.5	17.5	20	22
	d_2 H13	10.4	12.4	16.4	20.4	23.9	26.9	31.9	36.4	40.4
	$t_1 \approx$	2.5	2.9	3.7	4.7	5.2	5.7	7.2	8.2	9.2
Fine Series (f)	d_1 H12	5.3	6.4	8.4	10.5	13	15	17	19	21
	d_3 H12	10	11.5	15	19	23	26	30	34	37
	$t_1 \approx$	2.6	3	4	5	5.7	6.2	7.7	8.7	9.7
	$t_2 +0.1$ 0	0.2	0.45	0.7	0.7	0.7	0.7	1.2	1.2	1.7

Note 1 — Sizes shown in brackets are of second preference.

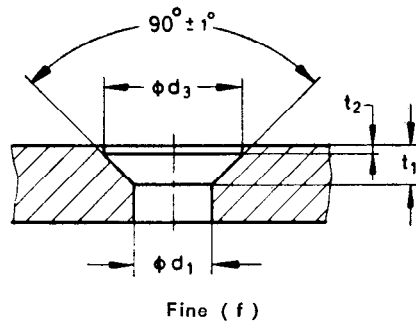
Note 2 — Clearance hole d_1 according to medium and fine series of IS : 1821-1982 'Dimensions for clearance holes for bolts and screws (second revision)'.

3.1.2 Designation — A countersink Type A with clearance hole of fine (f) series and having nominal size 10 shall be designated as:

Countersink A f 10 — IS : 3406

3.2 Type B

3.2.1 Dimensions



All dimensions in millimetres.

For Nominal Size		3	4	5	6	8	10	12	(14)	16	(18)	20	(22)	24
Fine Series (f)	d_1 H12	3.2	4.3	5.3	6.4	8.4	10.5	13	15	17	19	21	23	25
	d_3 H12	6.3	8.3	10.4	12.4	16.5	20.5	25	28	31	34	37	48.2	52
	$t_1 \approx$	1.7	2.4	2.9	3.3	4.4	5.5	6.5	7	7.5	8	8.5	13.1	14
	$t_2 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$	0.2	0.3			0.4	0.5						1	

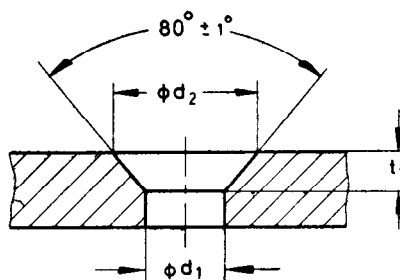
Note 1 — Sizes shown in brackets are of second preference.
Note 2 — Clearance hole d_1 according to fine series of IS : 1821-1982.

3.2.2 Designation — A countersink Type B with clearance hole of fine (f) series and having nominal size 10 shall be designated as:

Countersink B f 10 — IS : 3406

3.3 Type C

3.3.1 Dimensions



All dimensions in millimetres.

For Screw Size No.	(0)	(1)	2	(3)	4	(5)	6	(7)	8	10	(12)	14	(16)
d_1 H12	1.6	2	2.4	2.8	3.1	3.5	3.7	4.2	4.5	5.1	5.8	6.7	8.4
d_2 H12	3.1	3.8	4.6	5.2	5.9	6.6	7.2	8.1	8.7	10.1	11.4	13.2	16.6
$t_1 \approx$	0.9	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.6	3	3.4	3.9	4.9

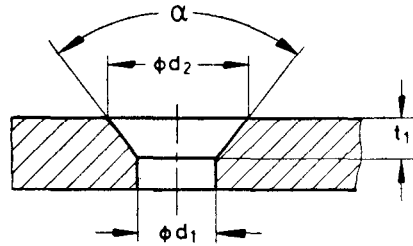
Note — Sizes given in brackets are of second preference.

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3.3.2 Designation — A countersink Type C for screw size 2 shall be designated as:
Countersink C 2 — IS : 3406

3.4 Type E

3.4.1 Dimensions



All dimensions in millimetres.

For Nominal Size	10	12	16	20	22	24
d_1 H12	10.5	13	17	21	23	25
d_2 H13	19	24	31	34	37	40
$t_1 \approx$	5.5	7	9	11.5	12	13
$\alpha \pm 1^\circ$	75°			60°		

Note — Clearance hole d_1 according to fine series of IS : 1821-1982.

3.4.2 Designation — A countersink Type E, for nominal size 10 shall be designated as:
Countersink E 10 — IS : 3406.

4. Methods of Representation in Drawings

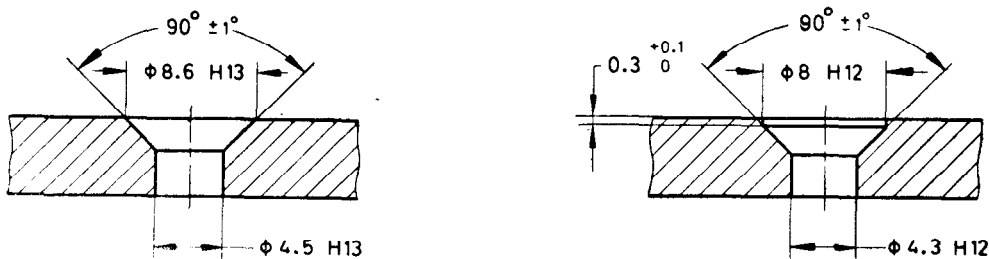
4.1 Countersinks shall be identified either by code designation or using dimension entries

Example 1 : When using code designation

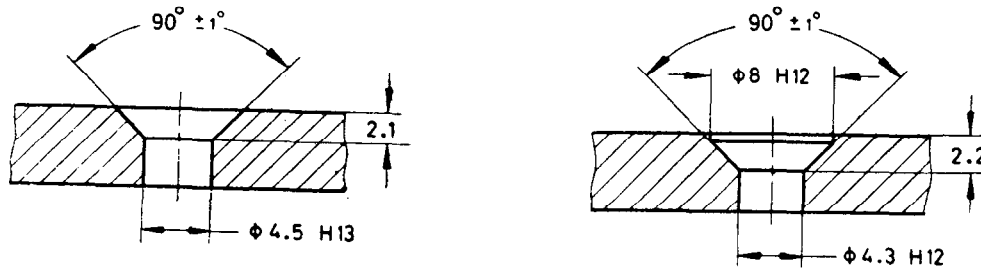


Example 2 : When using dimension entries

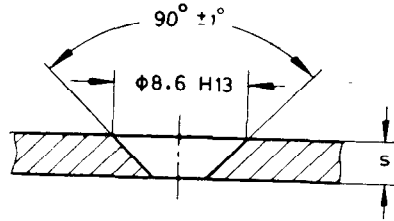
2(a) When indicating the diameter of countersink:



2(b) When indicating the depth of countersink:



2(c) In case of components with: $s \leq t_1$



the connecting pieces shall, if necessary, be, countersunk subsequently.

EXPLANATORY NOTE

This standard was originally published in 1966 to cover the dimensions of countersink for screws M1.6 to M20 and counterbores for cheese head and socket head screws M1.6 to M26 according to IS : 1365-1962 and IS : 1366-1962, respectively.

It was first revised in 1975 and published in two parts; Part 1 covered the dimensions for countersinks of two types — Type A for screws according to IS : 1365-1968 'Specification for slotted countersunk head and slotted raised countersunk head screws (*second revision*)' in the diameter range 1.6 to 20 mm, and Type B for screws according to IS : 5308-1969 'Specification for slotted countersunk head screws, small head series (dia 1.6 to 6 mm)'. In the revision care was also taken to conform the dimensions specified in IS : 1821-1982 'Dimensions for clearance holes for bolts and screws' (*second revision*); IS : 5693-1970 'Specification for countersunk with parallel shanks', and IS : 5703-1970 'Specification for countersunks with Morse taper shanks'.

This second revision incorporates a number of changes as a result of further experience gained and other developments in this field.

The main modifications are:

- Inclusion of more number of tables to cover the dimensions for screws and bolts according to IS : 6761-1972, IS : 7169-1974, IS : 7170-1974, IS : 7485-1985, IS : 7486-1985, IS : 8412-1977 and IS : 8911-1978.
- Addition of Types C and E.
- Replacement of IS : 5308-1969 by IS : 6761-1972 in Type B and covering only fine series.
- Methods of representation on drawings.

Part 2 of this standard covers the dimensions of counterbores.

In preparation of this standard, assistance has been derived from DIN 74 Part 1-1980 'Countersinks for countersunk head screws' issued by DIN Deutsches Institute Für Normung e.r. Berlin.