UDC 621.9-229.3 April 1986

60° centre holes
Types R, A, B, and C

DIN 332 Part 1

Zentrierbohrungen 60°; Form R, A, B und C

Supersedes November 1973 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

See Explanatory notes for connection with International Standards ISO 866 – 1975, ISO 2540 – 1973, and ISO 2541 – 1972 published by the International Organization for Standardization (ISO).

Dimensions in mm

1 Scope and field of application

This standard applies to unthreaded 60° centre holes for general engineering purposes.

Centre holes of type R, type A up to and including size 12,5 mm X 26,5 mm, and type B up to and including 10 mm X 21,2 mm are made with type R, A or B centre drills as specified in DIN 333.

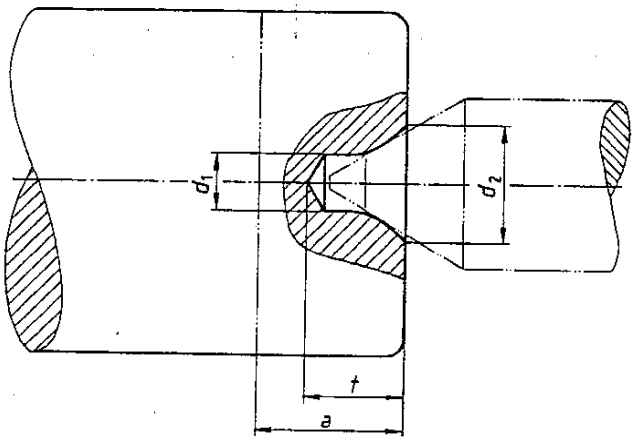
Type A centre holes above size 12,5 mm X 26,5 mm, type B centre holes above size 10 mm X 21,2 mm and type C centre holes are normally manufactured by means of two or more tools in different, successive operations. For the centring portion of type C centre holes up to and including size 12,5 mm X 26,5 mm or 10 mm X 21,2 mm, however, type A or type B centre drills as specified in DIN 333 may be used, since the centring portion is the same for types A, B and C.

Unspecified details of the centre holes made with centre drills result from the shape of the centre drill (see Explanatory notes).

See DIN 332 Part 7 for the determination of d_1 for a workpiece mass up to 28 000 kg.

2 Dimensions, designation

2.1 Type R, radius form, without protective chamfer



Designation of a radius form 60° centre hole without protective chamfer (R), with diameter d_1 = 4 mm and diameter d_2 = 8,5 mm:

Centre hole DIN 332 – R 4 X 8,5

Table 1.

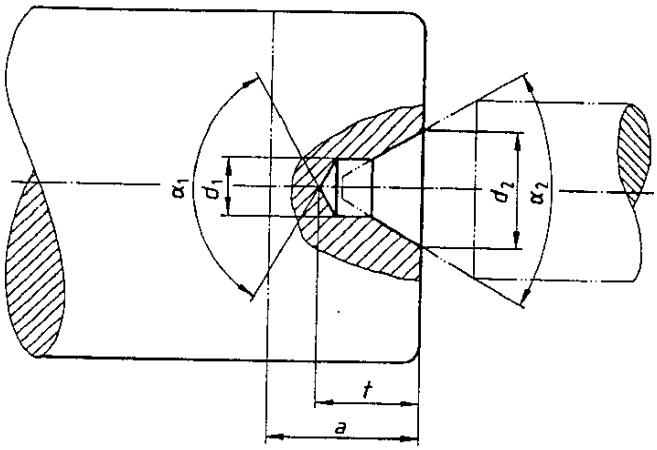
d_1	d_2	t [1] Minimum	a [2]	d_1	d_2	t [1] Minimum	a [2]
0,5	1,06	1,4	2	● 3,15	6,7	5,8	9
0,8	1,7	1,5	2,5	● 4	8,5	7,4	11
● 1	2,12	1,9	3	● 5	10,6	9,2	14
● 1,25	2,65	2,3	4	● 6,3	13,2	11,4	18
● 1,6	3,35	2,9	5	● 8	17	14,7	22
● 2	4,25	3,7	6	● 10	21,2	18,3	28
● 2,5	5,3	4,6	7	12,5	26,5	23,6	36

● These sizes are specified in ISO 2541 – 1972.

For [1] and [2], see table 2.

Continued on pages 2 to 5

2.2 Type A, straight form, without protective chamfer



Designation of a straight form 60° centre hole without protective chamfer (A), with diameter d_1 = 4 mm and diameter d_2 = 8,5 mm:

Centre hole DIN 332 – A 4 × 8,5

Table 2.

d_1	d_2	t [1] Minimum	a [2]
● 0,5	1,06	1	2
● 0,8	1,7	1,5	2,5
● 1	2,12	1,9	3
● 1,25	2,65	2,3	4
● 1,6	3,35	2,9	5
● 2	4,25	3,7	6
● 2,5	5,3	4,6	7
● 3,15	6,7	5,9	9
● 4	8,5	7,4	11
● 5	10,6	9,2	14
● 6,3	13,2	11,5	18
● 8	17	14,8	22
● 10	21,2	18,4	28
12,5	26,5	23,6	36

d_1 H12	d_2 JS12	t [1] Maximum	t [1] Minimum	α_1	α_2 0 −1°	a [2]
16	33,5	37,5	30	120°	60°	45
20	42,5	47,5	37,5			56
25	53	60	47,5			71
31,5	67	75	60			90
40	85	95	75			112
50	106	118	95			140

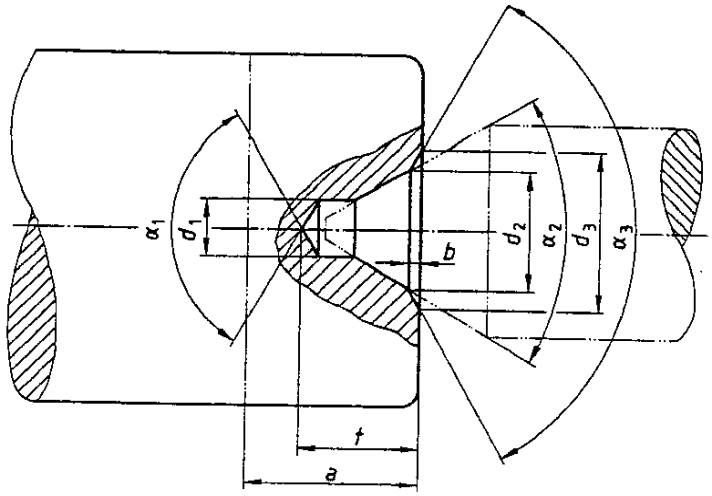
● These sizes are specified in ISO 866 – 1975.

1) In the case of centre holes made with centre drills, dimension t depends on length l_2 of the centre drill as specified in DIN 333 including re-ground drills. t_{min} is the minimum size of t which will preclude a fully reground 60° centre from contacting the bottom of the hole, provided that the specified diameter d_2 is maintained.

Dimension t_{min} thus defines the limit up to which centre drills may be reground.

2) Part-off dimension a applies to centre holes which are not left on the workpiece (left unspecified in ISO 866 – 1975, ISO 2540 – 1973 and ISO 2541 – 1972).

2.3 Type B, straight form, with conical protective chamfer



Designation of a straight form 60° centre hole with conical protective chamfer (B), with diameter d_1 = 4 mm and diameter d_2 = 8,5 mm:

Centre hole DIN 332 – B 4 X 8,5

Table 3.

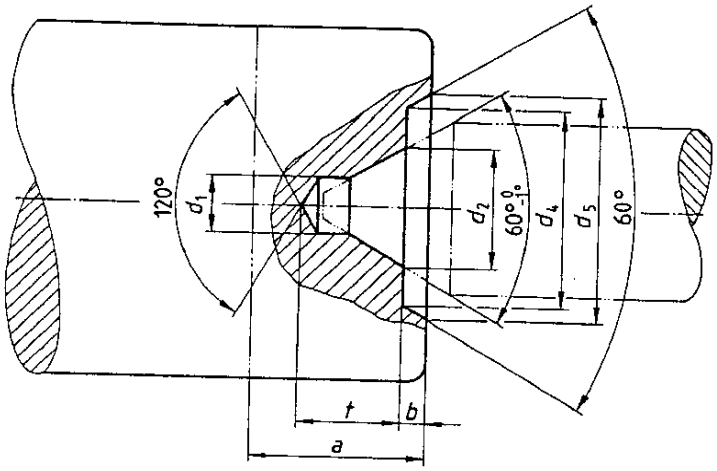
d_1	d_2	b	d_3	t 1) Minimum	a 2)
● 1	2,12	0,3	3,15	2,2	3,5
● 1,25	2,65	0,4	4	2,7	4,5
● 1,6	3,35	0,5	5	3,4	5,5
● 2	4,25	0,6	6,3	4,3	6,6
● 2,5	5,3	0,8	8	5,4	8,3
● 3,15	6,7	0,9	10	6,8	10
● 4	8,5	1,2	12,5	8,6	12,7
● 5	10,6	1,6	16	10,8	15,6
● 6,3	13,2	1,4	18	12,9	20
● 8	17	1,6	22,4	16,4	25
● 10	21,2	2	28	20,4	31

d_1 H12	d_2 JS12	b	d_3	t 1) Maximum	t 1) Minimum	a 2)	α_1	α_2 $^{0}_{-1°}$	α_3
12,5	26,5	2	33,5	32,1	25,6	38	120°	60°	120°
16	33,5	2,6	42,5	40,1	32,6	48			
20	42,5	3	53	50,5	40,5	60			
25	53	2,9	63	62,9	50,4	75			
31,5	67	3,8	80	73,8	63,8	95			
40	85	4,3	100	99,3	79,3	118			
50	106	5,5	125	123,5	100,5	150			

● These size are specified in ISO 2540 – 1973.

For 1) and 2), see table 2.

2.4 Type C, straight form, with truncated protective chamfer (left unspecified in ISO Standards)



Designation of a straight form 60° centre hole with truncated protective chamfer (C), with diameter d_1 = 4 mm and diameter d_2 = 8,5 mm:

Centre hole DIN 332 – C 4 × 8,5

Table 4.

d_1	d_2	b	d_4	d_5	t [1] Minimum	a [2]
1	2,12	0,4	4,5	5	1,9	3,5
1,25	2,65	0,6	5,3	6	2,3	4,5
1,6	3,35	0,7	6,3	7,1	2,9	5,5
2	4,25	0,9	7,5	8,5	3,7	6,6
2,5	5,3	0,9	9	10	4,6	8,3
3,15	6,7	1,1	11,2	12,5	5,9	10
4	8,5	1,7	14	16	7,4	12,7
5	10,6	1,7	18	20	9,2	15,6
6,3	13,2	2,3	22,4	25	11,5	20
8	17	3	28	31,5	14,8	25
10	21,2	3,9	35,5	40	18,4	31
12,5	26,5	4,3	45	50	23,6	42,5

d_1 H12	d_2 JS12	b	d_4	d_5	t [1] Maximum	t [1] Minimum	a [2]
16	33,5	6,1	56	63	37,5	30	53
20	42,5	7,8	71	80	47,5	37,5	67
25	53	8,7	90	100	60	47,5	85
31,5	67	11,3	112	125	75	60	106
40	85	17,3	140	160	95	75	132
50	106	17,3	180	200	118	95	170
For [1] and [2], see table 2.							

3 Indications on drawings

See DIN 332 Part 10 for indication of centre hole on engineering drawings.

Standards referred to

DIN 332 Part 7	Machine tools; 60° centre holes; dimensioning
DIN 332 Part 10	Centre holes; indications on drawings
DIN 333	60° centre drills; types R, A and B
ISO 886 – 1975 *)	Centre drills for centre holes without protecting chamfers; type A
ISO 2540 – 1973 *)	Centre drills for centre holes with protecting chamfers; type B
ISO 2541 – 1972 *)	Centre drills for radius form centre holes; type R

Other relevant standards

DIN 332 Part 2	Threaded 60° centre holes for shaft ends on electric machines
DIN 332 Part 4	Centre holes for axles for railway vehicles
DIN 332 Part 8	90° centre holes, type S; dimensions, method of determination

Previous editions

DIN 332 Part 3: 02.43, 09.50x
DIN 332 Part 1: 09.22, 02.43, 09.60x, 11.73

Amendments

The following amendments have been made in comparison with the November 1973 edition.

a) The "Scope and field of application" clause has been included.

b) The example of designation has been amended in compliance with DIN 820 Part 27.

c) The table containing indications on drawings has been replaced by a reference to DIN 332 Part 10

d) The standard has been editorially revised.

Explanatory notes

Centre drills and centre holes are covered by the following ISO Standards: ISO 866, ISO 2540 and ISO 2541.

The centre holes are dealt with in an appendix in each of these international standards.

The dimensions of type R centre holes of sizes 1 mm X 2,12 mm up to and including 10 mm X 21,2 mm, type A centre holes of sizes up to and including 10 mm X 21,2 mm and type B centre holes of sizes up to and including 10 mm X 21,2 mm specified in this standard agree with those specified in the appendices of the above ISO Standards.

In order to avoid redundancy of the dimensioning of centre holes made with centre drills as specified in DIN 333 (up to and including sizes 10 mm X 21,2 mm and 12,5 mm X 26,5 mm), only the dimensions essential for functional and manufacturing reasons are indicated. All the other dimensions derive from the geometry of the centre drill. The larger centre holes are dimensioned according to the usual rules of drawing practice.

For the depth of the centre hole, t, a minimum dimension has been stated which prevents a fully ground 60° centre point from making contact with the bottom of the hole. Once this minimum dimension is reached, with diameter d_2 being maintained, no further regrinding of the centre drill can be carried out unless it is accepted that the centre point may break (see DIN 806 and DIN 807). In order to take into account the shape of the centre point, the depth of the centre hole has been taken to be the distance from the workpiece surface to the bottom of the hole.

The dimensions of the centring portion of type B and type C holes, the latter being intended for workpieces machined on the face, are similar to those of type A.

International Patent Classification

B 23 B 49/04
B 27 C 3/00

*) ISO Standards are obtainable from *Beuth Verlag GmbH*, Burggrafenstraße 6, D-1000 Berlin 30.