
**Hollow taper interface with flange
contact surface —**

**Part 3:
Dimensions of shanks for stationary
tools**

Interfaces à cône creux-face —

Partie 3: Dimensions des queues pour outils non rotatifs



Reference number
ISO 12164-3:2014(E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 29, *Small tools*.

This second edition cancels and replaces the first edition (ISO 12164-3:2008), [Figure 1](#) and [Table 1](#) of which have been technically revised.

ISO 12164 consists of the following parts, under the general title *Hollow taper interface with flange contact surface*:

- *Part 1: Shanks — Dimensions*
- *Part 2: Receivers — Dimensions*
- *Part 3: Dimensions of shanks for stationary tools*
- *Part 4: Dimensions of receivers for stationary tools*

Hollow taper interface with flange contact surface —

Part 3: Dimensions of shanks for stationary tools

1 Scope

This part of ISO 12164 specifies dimensions for hollow taper shanks with flange contact surface (HSK) to be applied to machine tools (e.g. turning machines, turning-mill machines). A range of shank sizes is specified.

This part of ISO 12164 specifies the shank of type T. It incorporates a grooved flange to enable automatic tool exchange. The tools can also be exchanged manually via a hole in the shank taper.

The torque is transmitted at the tail end of the shank through keys as well as friction.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 3040, *Geometrical product specifications (GPS) — Dimensioning and tolerancing — Cones*

3 Dimensions

3.1 General

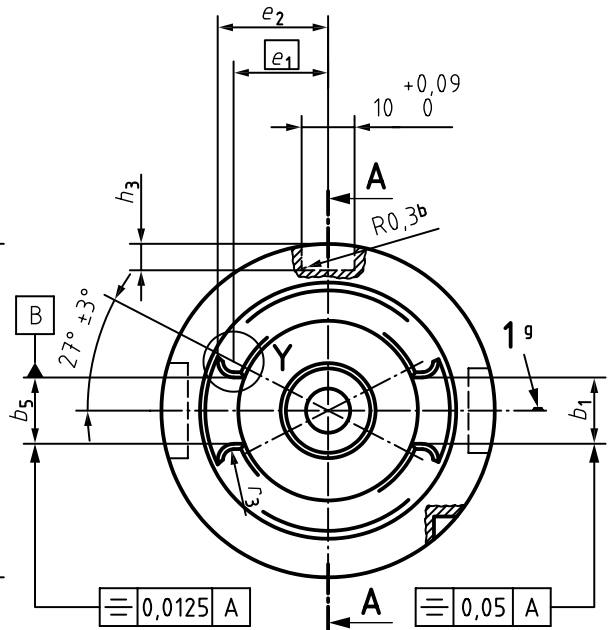
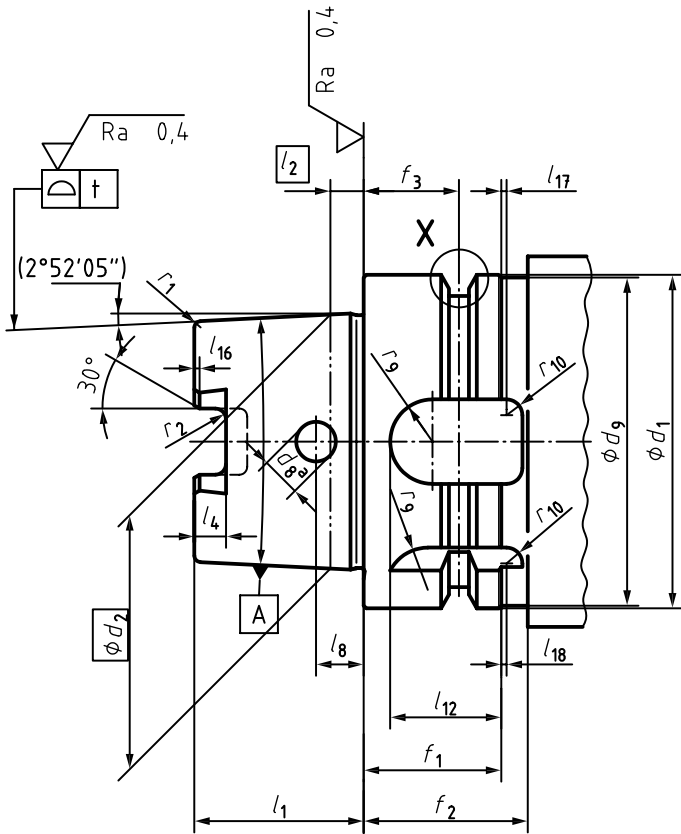
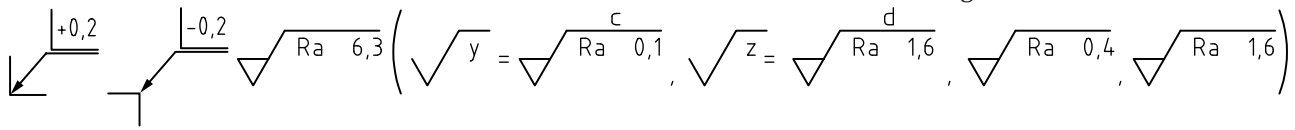
Dimensions of hollow taper shanks with flange contact surface for stationary tools, type T, are specified in [Figure 1](#), [Table 1](#), [Annex A](#), and [Annex B](#). Details not specified in [Figure 1](#) shall be chosen expediently. Tolerancing of form, orientation, location, and run-out is in accordance with ISO 1101. Dimensioning and tolerancing of cones are in accordance with ISO 3040. Tolerances not specified shall be of tolerance class «m» in accordance with ISO 2768-1.

3.2 Hollow taper shank, type T

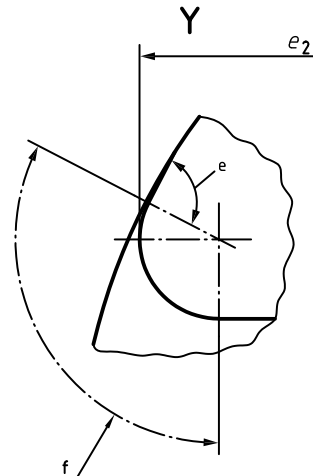
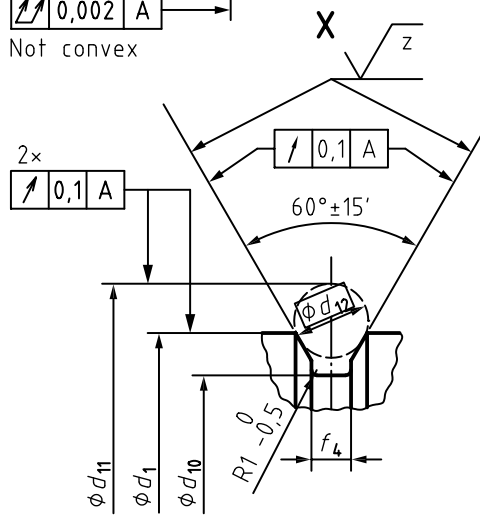
The dimensions of hollow taper shanks, type T, shall be in conformance with [Figure 1](#), [Table 1](#), and [Annex A](#).

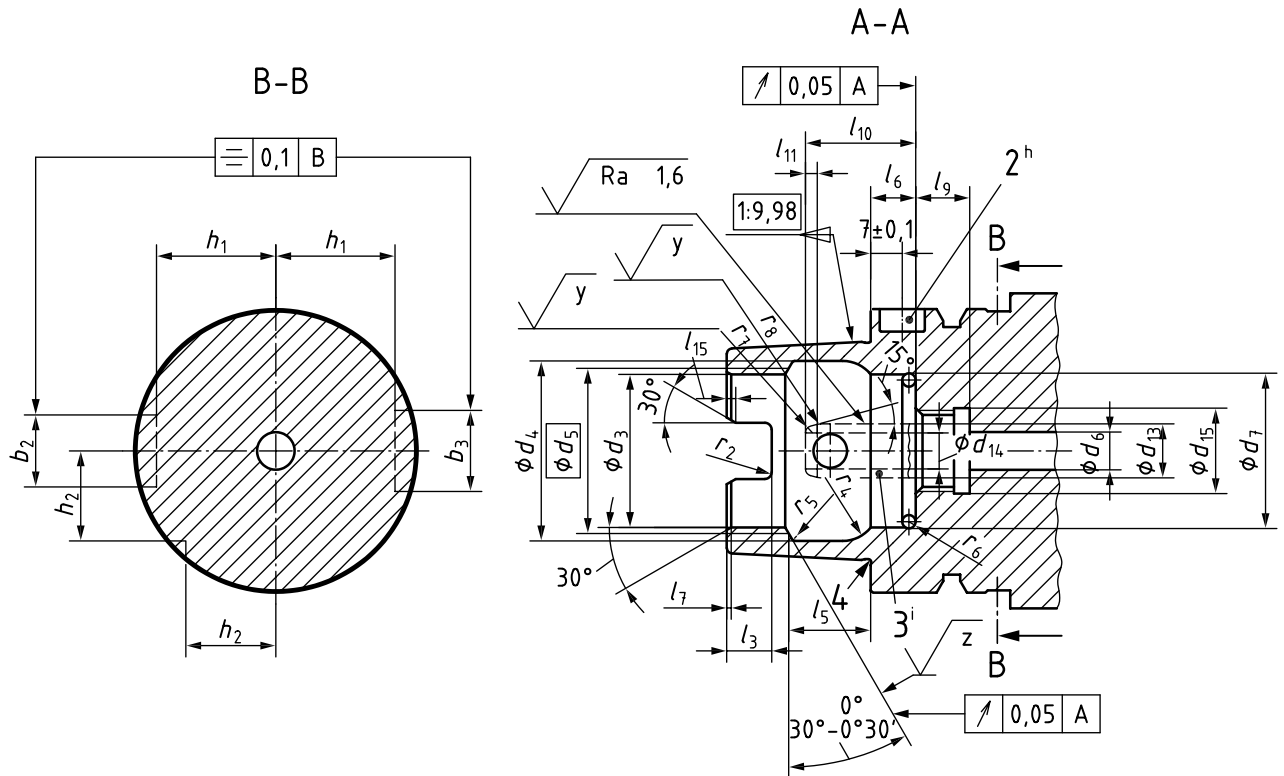
Dimensions in millimetres

Surface roughness values in micrometres



$\sqrt{0,002\ A}$
 Not convex





Key

- 1 cutting edge
- 2 data chip hole
- 3 lubrication pipe
- 4 groove (see [Annex A](#))
- a outer edge $0,5 \times 45^\circ$ min. chamfer
- b or $0,3 \times 45^\circ$
- c polished
- d fine turning
- e 90° = run-out
- f area of r_3
- g position of the cutting edge for right-hand tools with single cutting edge
- h optional
- i lubrication pipe shall be sealed, self-centred and shall allow an angular movement of $\pm 1^\circ$ with a low displacement force

Figure 1 — Dimensions for hollow taper shanks with flange contact surface

Table 1 — Dimensions of hollow taper shank, type T

Dimensions in millimetres

Nominal size		32	40	50	63	80	100	125	160
b_1	$\begin{matrix} +0,04 \\ -0,04 \end{matrix}$	7,05	8,05	10,54	12,54	16,04	20,02	25,02	30,02
b_2	H10	7	9	12	16	18	20	25	32
b_3	H10	9	11	14	18	20	22	28	36
b_5		6,932	7,932	10,425	12,425	15,93	19,91	24,915	29,915
	tol.	$\begin{matrix} +0,03 \\ 0 \end{matrix}$		$\begin{matrix} +0,035 \\ 0 \end{matrix}$			$\begin{matrix} +0,04 \\ 0 \end{matrix}$		
d_1	h10	32	40	50	63	80	100	125	160
d_2		24,007	30,007	38,009	48,010	60,012	75,013	95,016	120,016
d_3	H10	17	21	26	34	42	53	67	85
d_4	H11	20,5	25,5	32	40	50	63	80	100
d_5		19	23	29	37	46	58	73	92
d_6	max.	4,2	5	6,8	8,4	10,2	12	14	16
d_7	$\begin{matrix} 0 \\ -0,1 \end{matrix}$	17,4	21,8	26,6	34,5	42,5	53,8	—	—
d_8		4	4,6	6	7,5	8,5	12	—	—
d_9	max.	31	39	49	62	79	99	124	159
d_{10}	$\begin{matrix} 0 \\ -0,1 \end{matrix}$	26,5	34,8	43	55	70	92	117	152
d_{11}	$\begin{matrix} 0 \\ -0,1 \end{matrix}$	37	45	59,3	72,3	88,8	109,75	134,75	169,75
d_{12}		4	4	7	7	7	7	7	7
d_{13}	f8	6	8	10	12	14	16	18	20
d_{14}		3,5	5	6,4	8	10	12	14	16
d_{15}		M10 × 1	M12 × 1	M16 × 1	M18 × 1	M20 × 1,5	M24 × 1,5	M30 × 1,5	M35 × 1,5
e_1		8,82	11	13,88	17,99	21,94	27,37	35,37	44,32
e_2	$\begin{matrix} 0 \\ -0,05 \end{matrix}$	10,2	12,88	16,26	20,87	25,82	32,25	41,25	52,2
f_1	$\begin{matrix} 0 \\ -0,1 \end{matrix}$	20	20	26	26	26	29	29	31
f_2	min.	23	23	30	30	30	34	34	36
f_3	±0,1	16	16	18	18	18	20	20	22
f_4	$\begin{matrix} +0,15 \\ 0 \end{matrix}$	2	2	3,75	3,75	3,75	3,75	3,75	3,75
h_1	$\begin{matrix} 0 \\ -0,2 \end{matrix}$	13	17	21	26,5	34	44	55,5	72
h_2	$\begin{matrix} 0 \\ -0,3 \end{matrix}$	9,5	12	15,5	20	25	31,5	39,5	50
h_3	$\begin{matrix} +0,2 \\ 0 \end{matrix}$	5,4	5,2	5,1	5,0	4,9	4,9	4,8	4,8
l_1	$\begin{matrix} 0 \\ -0,2 \end{matrix}$	16	20	25	32	40	50	63	80

a r_3 tangent to b_1 or b_5 .

b r_9 applies equally to b_2 and b_3 .

c See [Annex A](#).

d The need for the O-ring depends on the clamping system (not part of delivery) used.

Table 1 (continued)

Nominal size	32	40	50	63	80	100	125	160
l_2	3,2	4	5	6,3	8	10	12,5	16
l_3	$\begin{matrix} +0,2 \\ 0 \end{matrix}$	5	6	7,5	10	12	15	19
l_4	$\begin{matrix} +0,2 \\ 0 \end{matrix}$	3	3,5	4,5	6	8	10	12
l_5	JS10	8,92	11,42	14,13	18,13	22,85	28,56	36,27
l_6	$\begin{matrix} 0 \\ -0,1 \end{matrix}$	8	8	10	10	12,5	12,5	16
l_7	$\begin{matrix} +0,3 \\ 0 \end{matrix}$	0,8	0,8	1	1	1,5	1,5	2
l_8	$\pm 0,1$	5	6	7,5	9	12	15	—
l_9	$\begin{matrix} 0 \\ -0,3 \end{matrix}$	6	8	10	12	14	16	18
l_{10}		20	21,5	23	24,5	26	28	30
l_{11}		2,5	2,5	3	3	3	3	3,5
l_{12}		12	12	19	21	22	24	24
l_{15}	$\begin{matrix} +0,3 \\ 0 \end{matrix}$	1,5	1,5	2	2	2,5	2,5	3,5
l_{16}	$\begin{matrix} +0,3 \\ 0 \end{matrix}$	0,8	0,8	1	1	1,5	1,5	2
l_{17}	min.	1	1	1	1	1	1	1
l_{18}	min.	1	1	1	1	1	1	1
r_1		0,6	0,8	1	1,2	1,6	2	2,5
r_2	$\begin{matrix} 0 \\ -0,2 \end{matrix}$	1	1	1,5	1,5	2	2	2,5
r_{3^a}	$\pm 0,05$	1,38	1,88	2,38	2,88	3,88	4,88	5,88
r_4		4	5	6	8	10	12	16
r_5		0,4	0,4	0,5	0,6	0,8	1	1,2
r_6		0,5	1	1,5	1,5	2	2	—
r_7		1	1	1	1,5	1,5	1,5	1,5
r_8		2	2	2	3	3	3	3
r_{9^b}		3,5	4,5	6	8	9	10	5
r_{10}	max.	2	2	3	4	4	5	6
t		0,002	0,002	0,002 5	0,003	0,004	0,004	0,005
Groove ^c		0,2 × 0,1	0,4 × 0,2	0,6 × 0,2	0,6 × 0,2	1 × 0,2	1 × 0,2	1,6 × 0,3
O-ring ^d		16 × 1	18,77 × 1,78	21,89 × 2,62	29,82 × 2,62	36,09 × 3,53	47,6 × 3,53	—
<p>^a r_3 tangent to b_1 or b_5.</p> <p>^b r_9 applies equally to b_2 and b_3.</p> <p>^c See Annex A.</p> <p>^d The need for the O-ring depends on the clamping system (not part of delivery) used.</p>								

4 Design

4.1 Data chip hole

Design without data chip hole is standard.

Design with data chip hole is optional.

4.2 Orientation notch

Design with notch is standard.

Design without notch is optional.

4.3 Clamping forces

The clamping system shall provide sufficient clamping force to ensure contact of the shank flange with the face of the receiver, as well as seating of the taper by elastic deformation. The torque transmitting capacity of the interface is substantially determined by the size of the clamping force.

A guide to clamping forces for hollow taper shank type T is given in [Annex B](#).

4.4 Hole for manual clamping

Design with hole for manual clamping is standard.

Design without hole for manual clamping is optional.

5 Designation

A hollow taper shank (HSK) for stationary tool in accordance with this part of ISO 12164 shall be designated by the following:

- a) "Hollow shank";
- b) a reference to this part of ISO 12164, i.e. ISO 12164-3;
- c) "HSK";
- d) type: T for stationary tools;
- e) nominal size, in millimetres.

EXAMPLE A hollow taper shank with flange contact surface (HSK) for stationary tools (type T) with nominal size 50 mm is designated as follows:

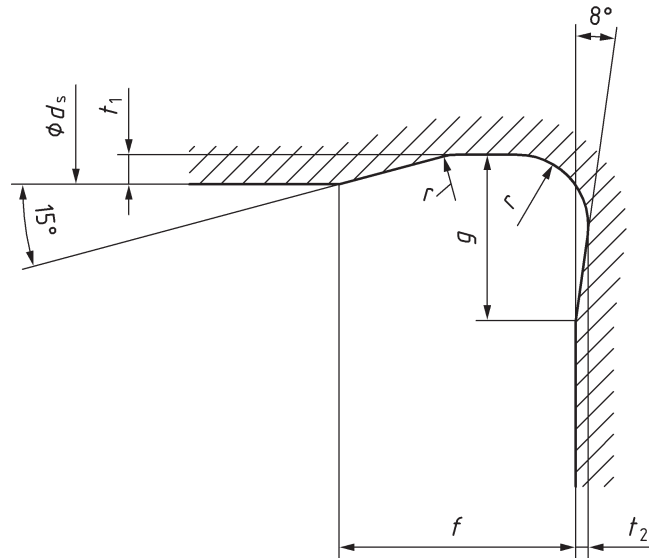
Hollow shank ISO 12164-3-HSK-T 50

Annex A (normative)

Details of groove

Figure A.1 gives the details of groove (see Figure 1).

Dimensions are given in Table A.1.



Key

d_s diameter of the shank

Figure A.1 — Details of groove

Table A.1 — Dimensions of groove

Dimensions in millimetres

r	t_1 +0,1 0	f	g ≈	t_2 +0,05 0
0,2	0,1	1	0,9	0,1
0,4	0,2	2	1,1	0,1
0,6	0,2	2	1,4	0,1
1	0,2	2,5	1,8	0,1
1,6	0,3	4	3,1	0,2

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A groove in accordance with this part of ISO 12164 shall be designated by the following:

- a) "Groove";
- b) radius, r , in millimetres;
- c) depth, t_1 , in millimetres.

EXAMPLE A groove with radius $r = 0,6$ mm and depth $t_1 = 0,2$ mm is designated as follows:

Groove 0,6 × 0,2

Annex B (informative)

Recommendations for use and application

B.1 Clamping forces

The recommended clamping forces are shown in [Table B.1](#).

The clamping forces are only applied to the hollow shanks for stationary tools (type T).

Table B.1 — Recommended clamping forces

Nominal size, mm	32	40	50	63	80	100	125	160
Clamping force, kN	5	8	14	24	37	55	86	150

Lower clamping forces can be sufficient when operational loads are low (e.g. cutting and feed forces in finish machining). Conversely, higher clamping forces can be required when high operational loads are encountered (e.g. cutting and feed forces in heavy machining).

B.2 Information about bending moment and stiffness

The manufacturer should provide information regarding permissible bending moment and stiffness.

B.3 Information about material and heat treatment

Hollow taper shanks should be heat-treated with consideration to strength, hardness, case depth (if not through-hardened), toughness, and wear requirements.

Bibliography

- [1] ISO 12164-4, *Hollow taper interface with flange contact surface — Part 4: Dimensions of receivers for stationary tools*

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