INTERNATIONAL STANDARD

ISO 12164-3

First edition
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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
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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 12164-3 was prepared by Technical Committee ISO/TC 29, *Small tools*.

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 may 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 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.

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, *Technical drawings — 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

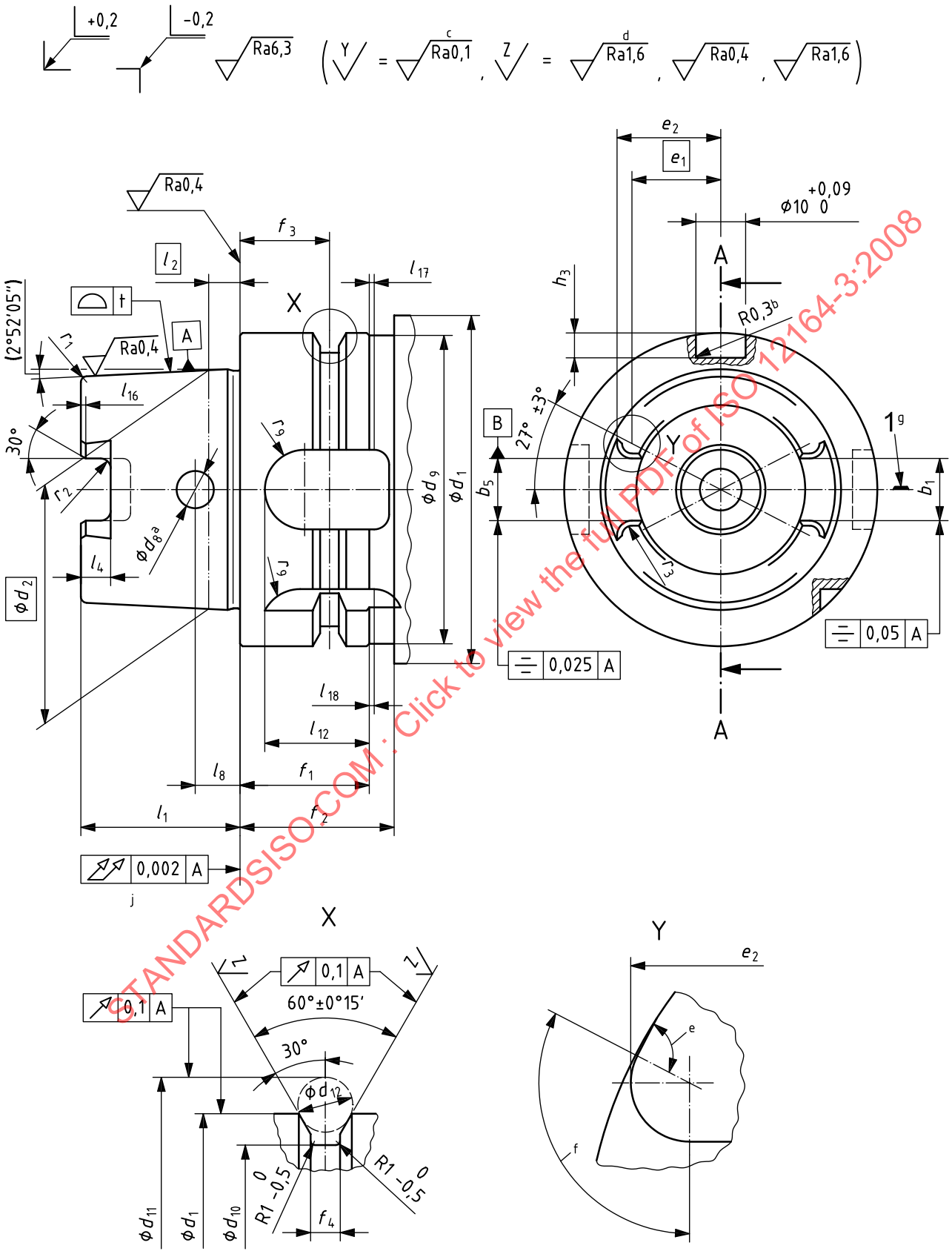


Figure 1 (*continued*)

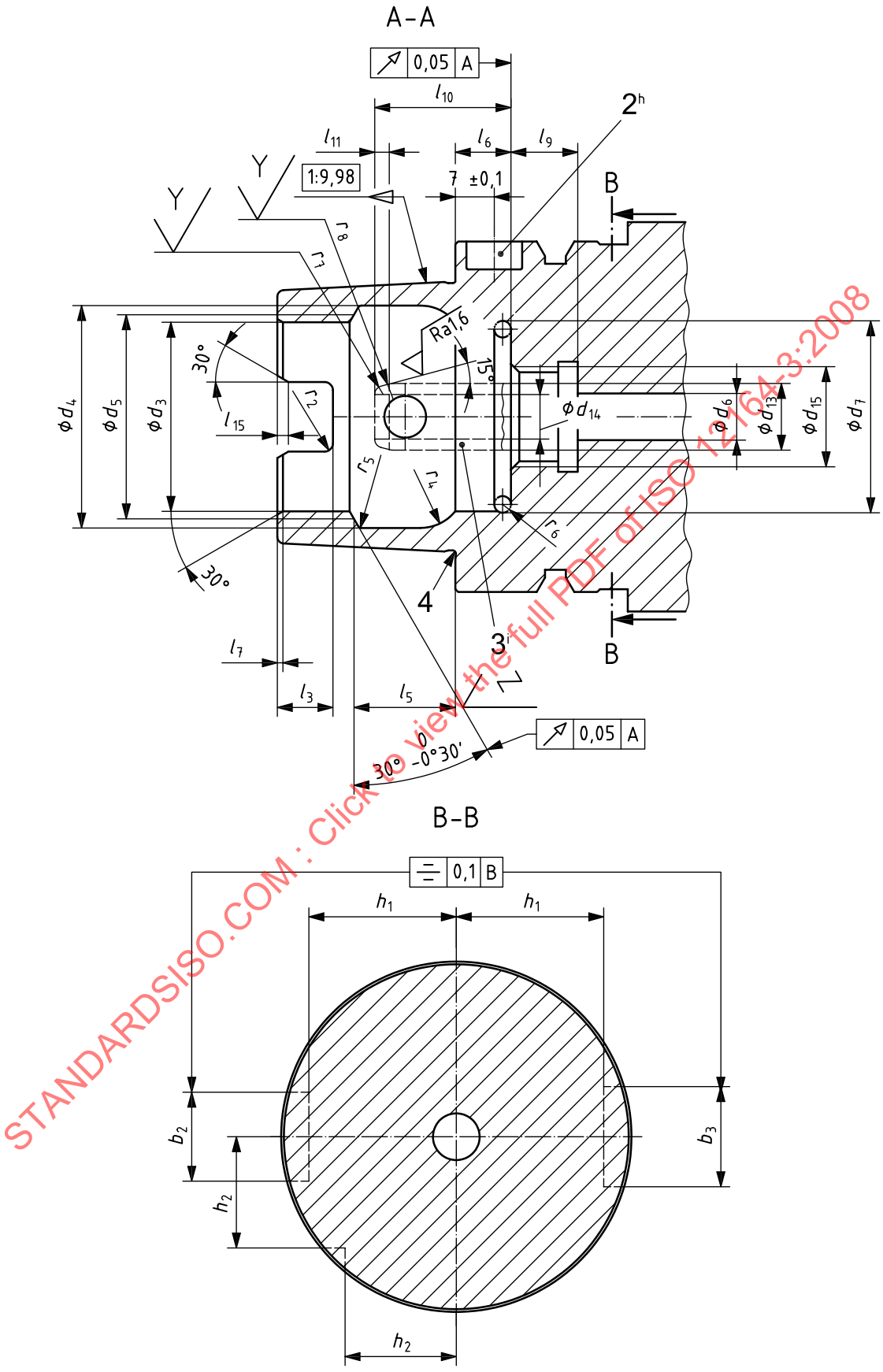


Figure 1 (*continued*)

Key

1 cutting edge
2 data chip hole
3 lubrication pipe
4 groove (see Annex A)
a Outer edge 0,5 × 45° min. chamfer.
b Or 0,3 × 45°.
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 ± 1° with a low displacement force.
j Not convex.

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

Table 1 — Dimensions

Dimensions in millimetres

Nominal size		32	40	50	63	80	100	125	160
b_1	$^{+0,04}_{-0,04}$	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.	$^{+0,03}_{0}$		$^{+0,035}_{0}$				$^{+0,04}_{0}$	
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	$^{0}_{-0,1}$	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}	$^{0}_{-0,1}$	26,5	34,8	43	55	70	92	117	152
d_{11}	$^{0}_{-0,1}$	37	45	59,3	72,3	88,8	109,75	134,75	169,75

Table 1 (*continued*)

Dimensions in millimetres

Nominal size		32	40	50	63	80	100	125	160
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	$^{0}_{-0,05}$	10,2	12,88	16,26	20,87	25,82	32,25	41,25	52,2
f_1	$^{0}_{-0,1}$	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	$^{+0,15}_{0}$	2	2	3,75	3,75	3,75	3,75	3,75	3,75
h_1	$^{0}_{-0,2}$	13	17	21	26,5	34	44	55,5	72
h_2	$^{0}_{-0,3}$	9,5	12	15,5	20	25	31,5	39,5	50
h_3	$^{+0,2}_{0}$	5,4	5,2	5,1	5,0	4,9	4,9	4,8	4,8
l_1	$^{0}_{-0,2}$	16	20	25	32	40	50	63	80
l_2		3,2	4	5	6,3	8	10	12,5	16
l_3	$^{+0,2}_{0}$	5	6	7,5	10	12	15	19	23
l_4	$^{+0,2}_{0}$	3	3,5	4,5	6	8	10	12	16
l_5	JS10	8,92	11,42	14,13	18,13	22,85	28,56	36,27	45,98
l_6	$^{0}_{-0,1}$	8	8	10	10	12,5	12,5	16	16
l_7	$^{+0,3}_{0}$	0,8	0,8	1	1	1,5	1,5	2	2
l_8	± 0,1	5	6	7,5	9	12	15	—	—
l_9	$^{0}_{-0,3}$	6	8	10	12	14	16	18	20
l_{10}		20	21,5	23	24,5	26	28	30	32
l_{11}		2,5	2,5	3	3	3	3	3,5	3,5
l_{12}		12	12	19	21	22	24	24	24
l_{15}	$^{+0,3}_{0}$	1,5	1,5	2	2	2,5	2,5	3,5	3,5
l_{16}	$^{+0,3}_{0}$	0,8	0,8	1	1	1,5	1,5	2	2

Table 1 (*continued*)

Dimensions in millimetres

Nominal size	32	40	50	63	80	100	125	160
l_{17} min.	1	1	1	1	1	1	1	1
l_{18} min.	1	1	1	1	1	1	1	1
r_1	0,6	0,8	1	1,2	1,6	2	2,5	3,2
r_2 $^{0}_{-0,2}$	1	1	1,5	1,5	2	2	2,5	2,5
r_3[a] ± 0,05	1,38	1,88	2,38	2,88	3,88	4,88	5,88	7,88
r_4	4	5	6	8	10	12	16	20
r_5	0,4	0,4	0,5	0,6	0,8	1	1,2	1,6
r_6	0,5	1	1,5	1,5	2	2	—	—
r_7	1	1	1	1,5	1,5	1,5	1,5	1,5
r_8	2	2	2	3	3	3	3	3
r_9[b]	3,5	4,5	6	8	9	10	5	5
t	0,002	0,002	0,002 5	0,003	0,004	0,004	0,005	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	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	—	—

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.

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) 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:

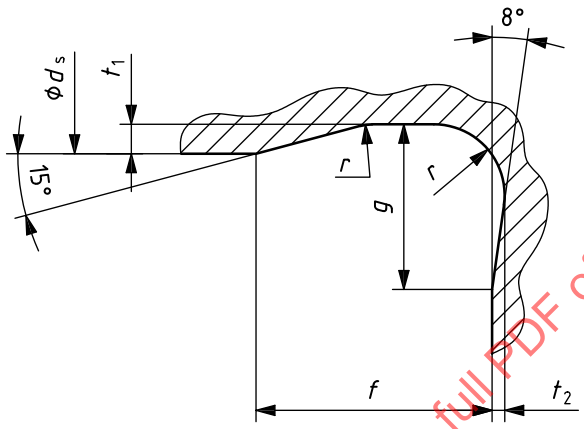
Hollow shank ISO 12164-3-HSK-T 50

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

Table A.1

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

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