INTERNATIONAL STANDARD

ISO 7388-3

Third edition
2016-02-01

Tool shanks with 7/24 taper for automatic tool changers —

Part 3: Retention knobs of forms AD, AF, UD, UF, JD and JF

Queues d'outils à conicité 7/24 pour changement automatique d'outils —

Partie 3: Tirettes de formes AD, AF, UD, UF, JD et JF

Reference number
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Foreword

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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*, Subcommittee SC 2, *Holding tools, adaptive items and interfaces*.

This third edition cancels and replaces the second edition (ISO 7388-3:2013), of which it constitutes a minor revision with the following changes:

— in the title and in all the text, "retention knobs for shanks of form" was changed to "retention knobs of form";

— forms AC and UC have been deleted from the title and from the designation (Clause 6);

— a footnote was added to Tables 1 and 5.

ISO 7388 consists of the following parts, under the general title *Tool shanks with 7/24 taper for automatic tool changers*:

— *Part 1: Dimensions and designation of shanks of forms A, AD, AF, U, UD and UF*

— *Part 2: Dimensions and designation of shanks of forms J, JD, and JF*

— *Part 3: Retention knobs of forms AD, AF, UD, UF, JD and JF*

Introduction

The aim of ISO 7388 is to integrate existing standards which are most commonly used as an industrial standard. In addition, the different developments for cooling and data chip have been taken into account.

Tool shanks with 7/24 taper for automatic tool changers —

Part 3:
Retention knobs of forms AD, AF, UD, UF, JD and JF

1 Scope

This part of ISO 7388 specifies the dimensions of retention knobs of forms AD, AF, UD, UF, JD and JF for tool shanks with a 7/24 taper for automatic tool changers used on machines having an automatic gripping system for feeding tools from the magazine to the spindle and vice-versa. These tools are designed with the most important dimensions for use in spindle noses according to ISO 9270 (all parts).

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 1629, *Rubber and latices — Nomenclature*

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

ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

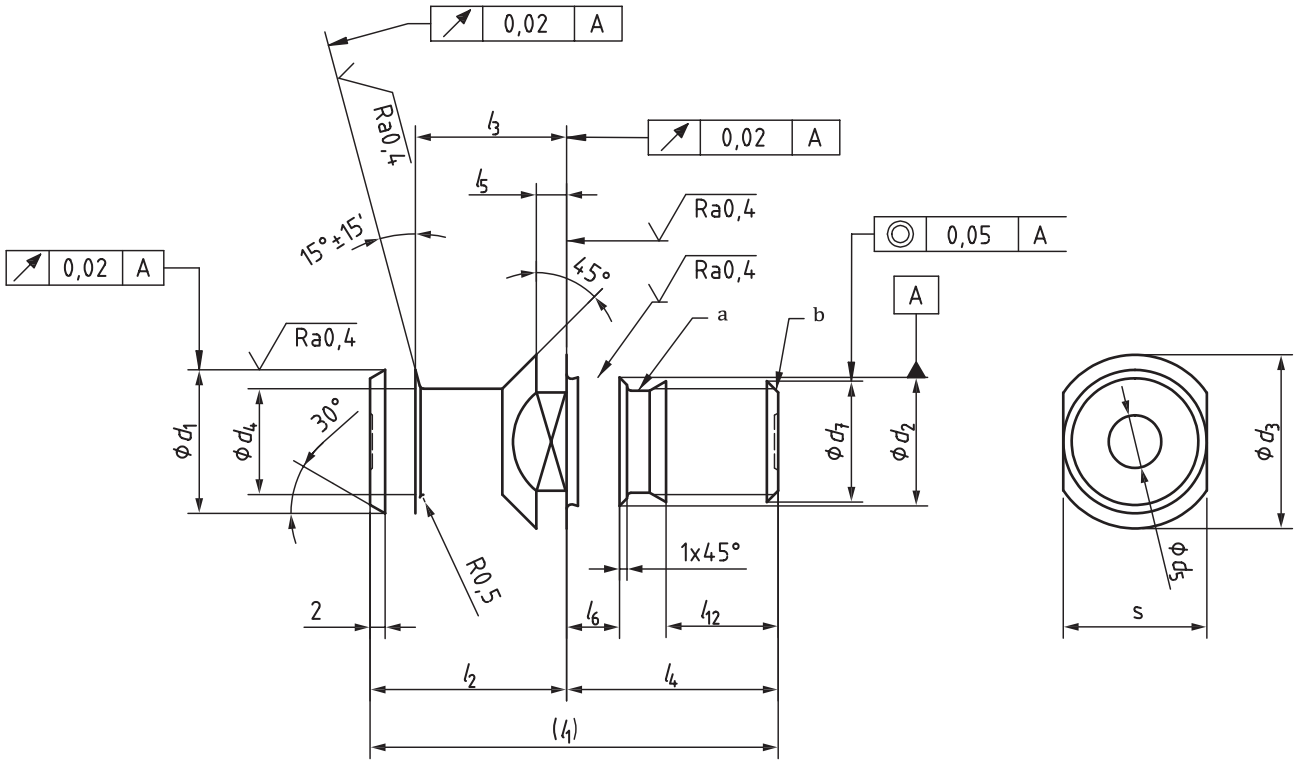
3 Dimensions

3.1 General

All dimensions and tolerances are given in millimetres; tolerancing is according to ISO 8015. Tolerances not specified shall be of tolerance class “m” in accordance with ISO 2768-1 and of class “k” in accordance with ISO 2768-2.

3.2 Retention knobs of form AD, for centric inner cooling lubricant supply

The dimensions of retention knobs of form AD shall be in accordance with the dimensions shown in Figure 1 and given in Table 1.



Key

a Thread undercut, at the manufacturer's discretion.

b Chamfered end (CH), according to ISO 4753.

Figure 1 — Retention knob — Form AD — Centric inner cooling lubricant supply

Table 1 — Retention knobs — Form AD — Dimensions

Shank no.	Dimension													
	d_1	d_2	d_3	d_4	d_5	d_7	l_1	l_2	l_3	l_4	l_5	l_6	l_{12}	s
	f7	f7	0 −0,2	0 −0,1	+0,1 0			±0,1	±0,1	+0,5 0			min.	0 −0,1
30[a]	13	13	17	9	—	M12	44	24	19	20	4	5	10	14
40	19	17	23	14	7	M16	54	26	20	28	4	7	13	19
45	23	21	30	17	9,5	M20	65	30	23	35	5	8	16	24
50	28	25	36	21	11,5	M24	74	34	25	40	5	10	19	30
60	40	32	52	30	14	M30	90	40	30	50	6	12	24	46

[a] Dimensions only for form AF.

3.3 Retention knobs of form AF, without cooling lubricant supply

The dimensions of retention knobs of form AF shall be in accordance with the dimensions shown in Figure 2 and given in Table 2. Other dimensions are the same as form AD.

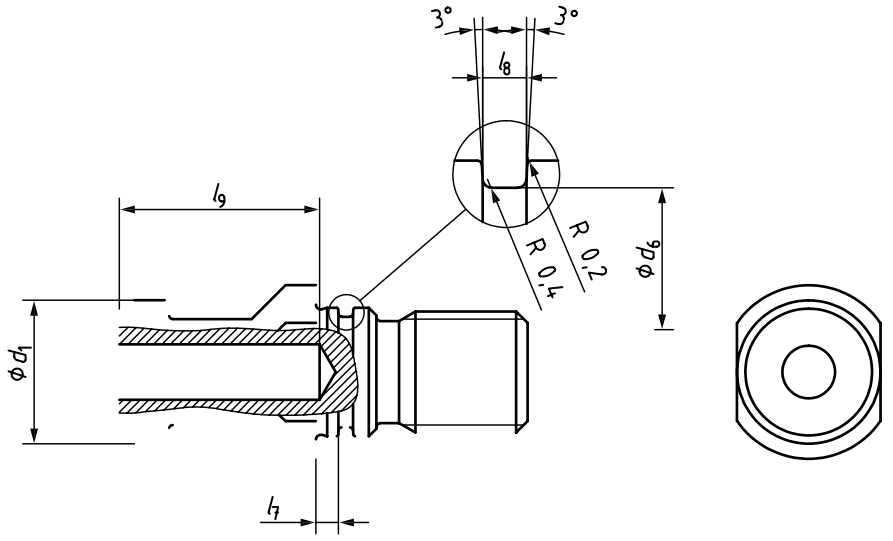


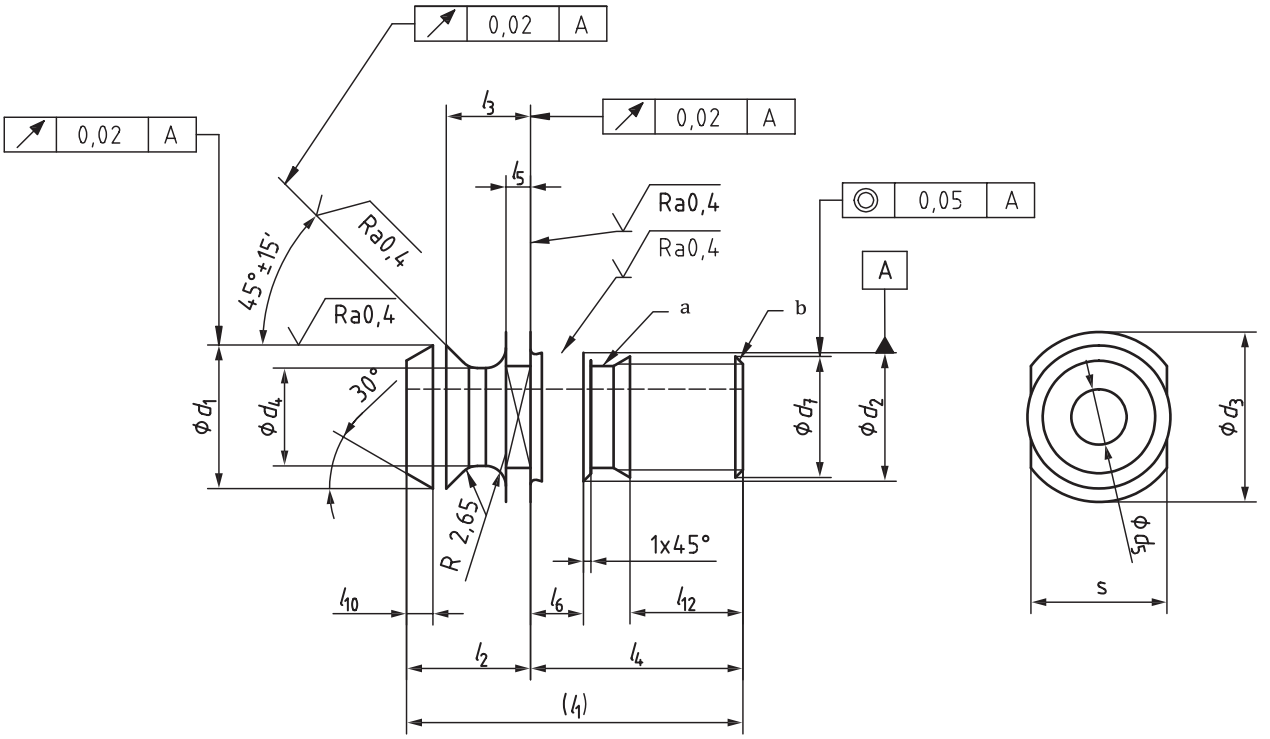
Figure 2 — Retention knob — Form AF — Without cooling lubricant supply

Table 2 — Retention knobs — Form AF — Dimensions

Shank no.	Dimension					O-ring
	d_1 f7	d_6 h11	l_7 0 −0,1	l_8 +0,2 0	l_9 +1 0	
30	13	11,5	2,3	1,4	—	11 × 1,0
40	19	14,6	3,0	1,9	27	14 × 1,5
45	23	17,8	3,3	2,5	33	17 × 2,0
50	28	20,8	4,5	3,0	37	20 × 2,5
60	40	27,8	5,5	3,0	45	27 × 2,5

3.4 Retention knobs of form UD, for centric inner cooling lubricant supply

The dimensions of retention knobs of form UD shall be in accordance with the dimensions shown in Figure 3 and given in Table 3.



Key

a Thread undercut, at the manufacturer's discretion.

b Chamfered end (CH), according to ISO 4753.

Figure 3 — Retention knob — Form UD — Centric inner cooling lubricant supply

Table 3 — Retention knobs — Form UD — Dimensions

Shank no.	Dimension															
	d_1	d_2	d_3		d_4	d_5	d_7	l_1	l_2	l_3	l_4	l_5	l_6	l_{10}	s	
	0 −0,3	h6	nom.	tol.	0 −0,3	+0,1 0			0 −0,2	0 −0,3		0 −0,5	0 −0,5	0 −0,5	nom.	tol.
30	13,35	13	16,5	0 −0,5	9,3	4,15	M12	31,8	11,8	8,15	20	2,75	5	2,4	13	0 −0,27
40	18,95	17	22,5	0 −1	12,95	7,35	M16	44,4	16,4	11,15	28	3,25	7	3,5	18	0 −0,33
45	24,05	21	30	0 −2	16,3	9,25	M20	55,95	20,95	14,85	35	4,25	8	3,85	24	0 −0,39
50	29,1	25	37		19,6	11,55	M24	65,55	25,55	17,95	40	5,25	10	4,85	30	0 −0,65
60	37,25	32	50		24,95	13,85	M30	88,15	38,15	27,65	50	7,75	12	6,75	36	0 −0,75

3.5 Retention knobs of form UF, without cooling lubricant supply

The dimensions of retention knobs of form UF shall be in accordance with the dimensions shown in Figure 4 and given in Table 4. Other dimensions are as for form UD.

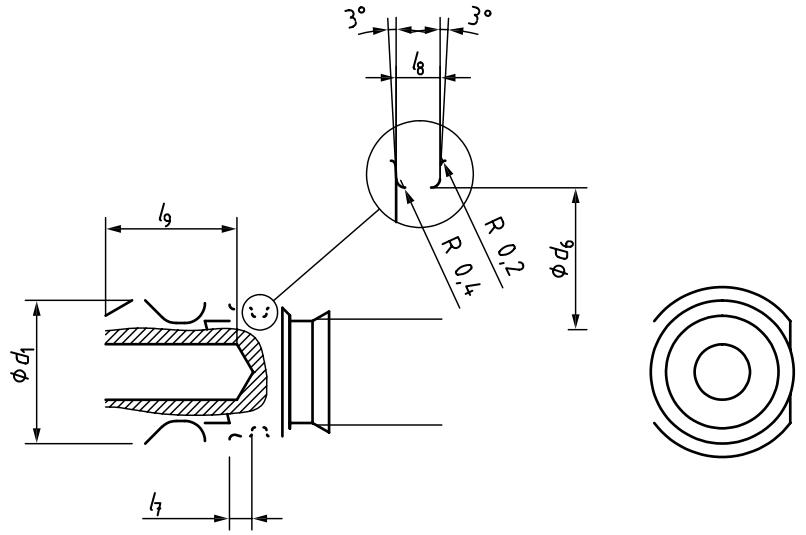


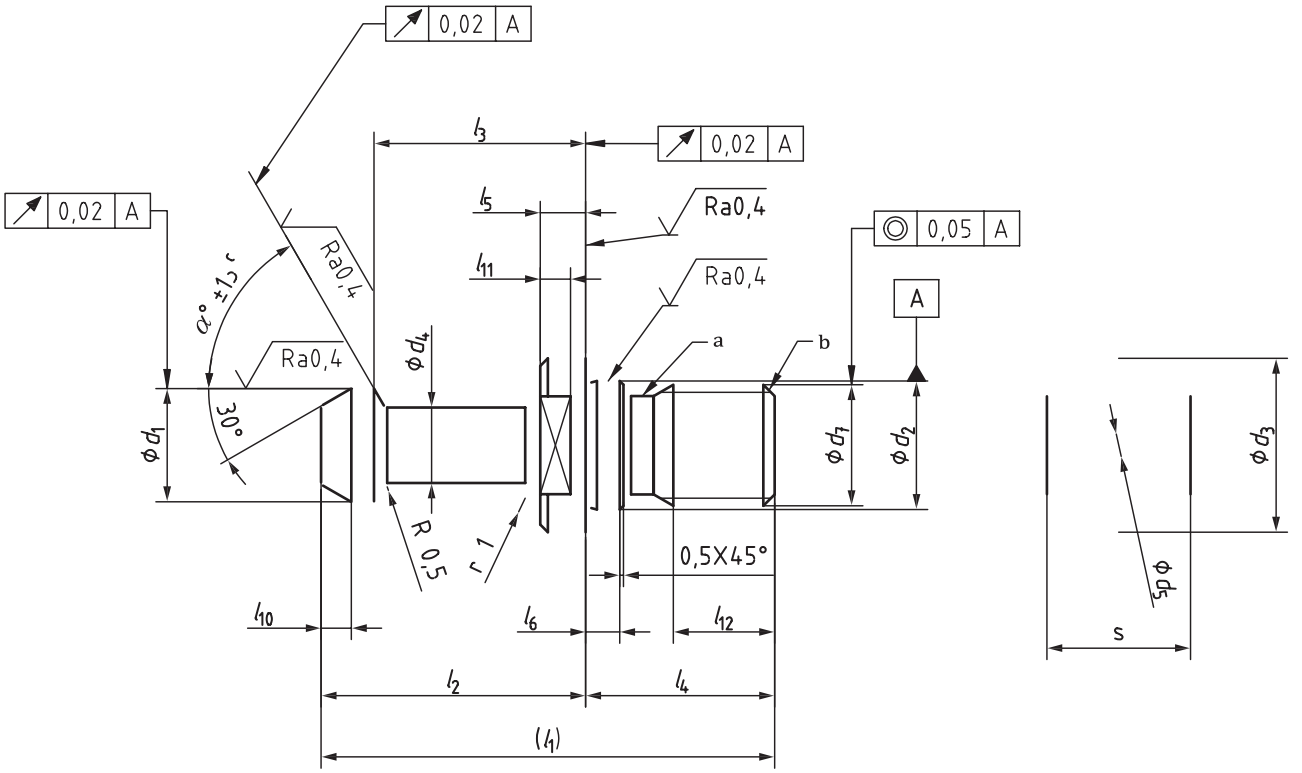
Figure 4 — Retention knob — Form UF — Without cooling lubricant supply

Table 4 — Retention knob — Form UF — Dimensions

Shank no.	Dimension					
	d_1 $^{0}_{-0,3}$	d_6 h11	l_7	l_8 $^{+0,2}_{0}$	l_9	O-ring
30	13,35	11,5	2,3	1,4	—	11 × 1,0
40	18,95	14,6	3,0	1,9	27	14 × 1,5
45	24,05	17,8	3,3	2,5	33	17 × 2,0
50	29,1	20,8	4,5	3,0	37	20 × 2,5
60	37,25	27,8	5,5	3,0	45	27 × 2,5

3.6 Retention knobs of form JD with centric inner cooling lubricant supply

The dimensions of retention knobs of form JD shall be in accordance with the dimensions shown in Figure 5 and given in Table 5.



Key

a Thread undercut, at the manufacturer's discretion.

b Chamfered end (CH), according to ISO 4753.

c $\alpha = 45°$ or $\alpha = 60°$. This information should be given and taken over in the designation (see Clause 6).

Figure 5 — Retention knob — Form JD — Centric inner cooling lubricant supply

Table 5 — Retention knobs — Form JD — Dimensions

Shank no.	Dimension																
	d_1	d_2	d_3	d_4	d_5	d_7	l_1	l_2	l_3	l_4	l_5	l_6	l_{10}	l_{11}	l_{12}	r_1	s
	0 −0,1	h7	0 −0,2	0 −0,1	+0,1 0	6h		0 −0,1	0 −0,1		0 −0,1		0 −0,5				0 −0,35
30[a]	11	12,5	16,5	7	—	M12	43	23	18	20	5	4	2,5	3,5	10	2	13
40[a]	15	17	23	10	—	M16	60	35	28	25	6	5	4	4	13	3	19
45	19	21	31	14	7	M20	70	40	31	30	8	6	5	6	16	4	24
50	23	25	38	17	8,5	M24	85	45	35	40	10	8	5	8	19	5	30
60	32	31	56	24	12	M30	115	65	53	50	14	10	7	11	24	5	46

[a] Dimensions only for form JF.

3.7 Retention knobs of form JF, without cooling lubricant supply

The dimensions of retention knobs of form JF shall be in accordance with the dimensions shown in Figure 6. Other dimensions are as for form JD.

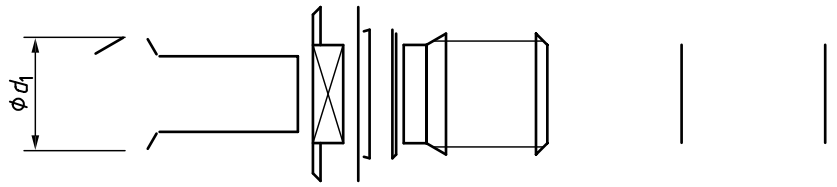


Figure 6 — Retention knob — Form JF — Without cooling lubricant supply

3.8 Retention knobs with data medium

For forms AF and UF without a hole, it is possible to install a data medium hole.

If a data medium hole is needed for form JF, the dimensions shall be defined by the manufacturer according to the data medium used. The location shall be as shown in Figure 7.

See Figures 2 and 4 and Tables 2 and 4.

The general dimensions are given in Table 6.

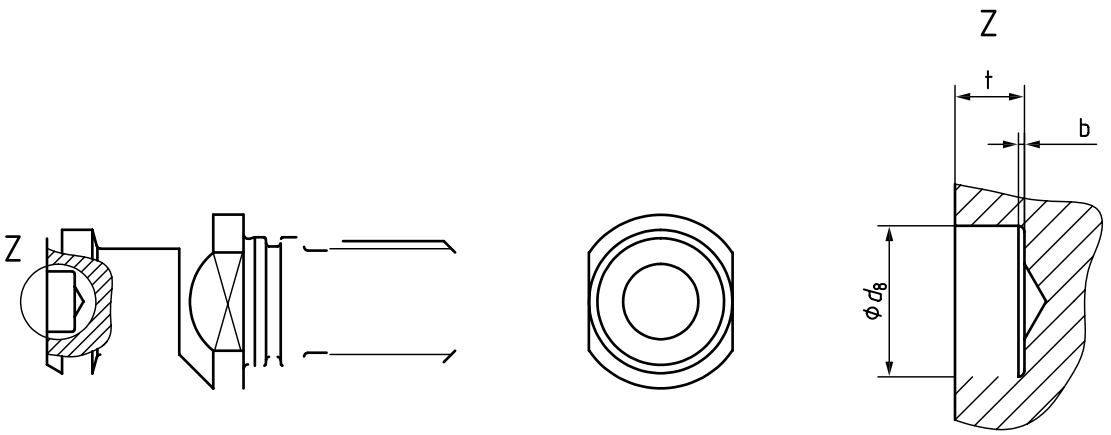


Figure 7 — Retention knob with data medium

Table 6 — Fitting dimension of the data medium

b_{max}	0,3 × 45° or R 0,3[a]
d_8	$10^{+0,09}_{0}$
t	$4,6^{+0,2}_{0}$
[a] At the manufacturer's discretion.	

4 Material

The steel is chosen at the manufacturer's discretion but shall have a tensile strength of at least 980 N/mm^2 and a hardness of from 55 HRC to 60 HRC.

No area of the retention knob shall be through hardened.

5 O-ring

The O-ring shall be according to ISO 1629 and shall be included as part of the delivery.

6 Designation

A retention knob in accordance with this part of ISO 7388 shall be designated as follows:

a) “Retention knob”;

b) a reference to this part of ISO 7388, i.e. ISO 7388-3;

c) a dash;

d) form AD, AF, UD, UF, JD or JF;

e) taper size;

f) a dash;

g) α values, in degrees (45° or 60°).

NOTE f) and g) only apply for retention knobs forms JD and JF.

EXAMPLE 1 Designation of a retention knob in accordance with ISO 7388-3, form AD, shank No. 40:

Retention knob ISO 7388-3-AD40

EXAMPLE 2 Designation of a retention knob in accordance with ISO 7388-3, form JD, shank No. 40 with a α angle of 45°:

Retention knob ISO 7388-3-JD40-45

Bibliography

[1] ISO 4753, *Fasteners — Ends of parts with external ISO metric thread*

[2] ISO 9270-1, *7/24 taper spindle noses for automatic tool changers — Part 1: Dimensions and designation of spindle noses of forms S and SF*

[3] ISO 9270-2, *7/24 taper spindle noses for automatic tool changers — Part 2: Dimensions and designation of spindle noses of forms J and JF*

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