INTERNATIONAL STANDARD

ISO 7388-1

Second edition
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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

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

Partie 1: Dimensions et désignation des queues de formes A, AD, AF, U, UD et UF

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 7388-1 was prepared by Technical Committee ISO/TC 29, *Small tools*.

This second edition cancels and replaces the first edition (ISO 7388-1:1983), which has been technically revised. It also incorporates the Addendum ISO 7388-1:1983/Add. 1:1984.

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 for shanks of forms AC, AD, AF, UC, 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 1:
Dimensions and designation of shanks of forms A, AD, AF, U, UD and UF

1 Scope

This part of ISO 7388 specifies the dimensions of tool shanks with a 7/24 taper, of shank forms A, AD, AF, U, UD and UF (with two possible additions for each), 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.

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 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, *Technical drawings — Fundamental tolerancing principle*

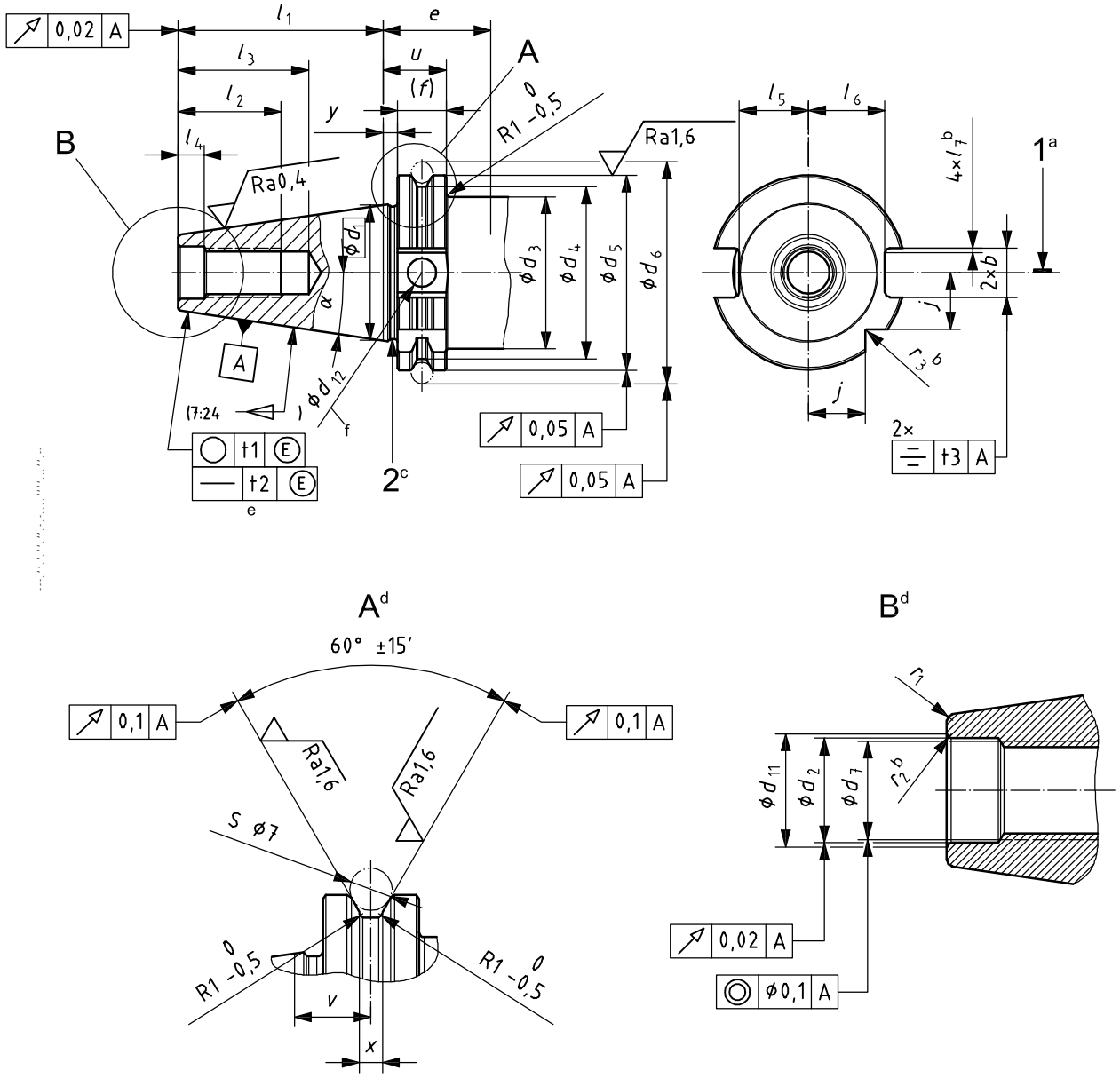
3 Dimensions

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 Shank forms A and U

See Figure 1 and Table 1.



Key

1 cutting edge

2 transition between taper and flange

a Position of the cutting edge for right hand tools with single cutting edge.

b At the option of the manufacturer (radius or chamfer).

c At the manufacturer's discretion.

d Scale: 2:1.

e Not convex.

f Depth. 0,4.

Figure 1 — Shank forms A and U

Table 1 — Dimensions of shanks of forms A and U

Dimension	Shank number									
	30		40		45		50		60	
	Form									
	A	U	A	U	A	U	A	U	A	U
$b\ ^{+0,2}_{0}$	16,1				19,3		25,7			
d_1 [a]	31,75		44,45		57,15		69,85		107,95	
d_2 H7	13		17		21		25		32	
d_3	45	31,75	50	44,45	63	57,15	80	69,95	130	107,95
d_3 tol.	Max.	$^{+0,15}_{-0,15}$	Max.	$^{+0,15}_{-0,15}$	Max.	$^{+0,15}_{-0,15}$	Max.	$^{+0,15}_{-0,15}$	Max.	$^{+0,15}_{-0,15}$
$d_4\ ^{0}_{-0,5}$	44,3	39,15	56,25		75,25		91,25		147,7	132,8
$d_5\ ^{0}_{-0,1}$	50	46,05	63,55		82,55		97,5	98,5	155	139,75
$d_6 \pm 0,05$	59,3	54,85	72,3		91,35		107,25	108,25	164,75	149,5
d_7 6H	M12		M16		M20		M24		M30	
d_{11} max.	14,5		19		23,5		28		36	
d_{12}	—	9,52	—	9,52	—	9,52	—	9,52	—	9,52
e min.	35								38	
f [b]	15,9									
$j\ ^{0}_{-0,3}$	15	—	18,5	—	24	—	30	—	49	—
$l_1\ ^{0}_{-0,3}$	47,8		68,4		82,7		101,75		161,9	
l_2 min.	24		32		40		47		59	
l_3 min.	33,5		42,5		52,5		61,5		76	
$l_4\ ^{+0,5}_{0}$	5,5		8,2		10		11,5		14	
l_5	16,3		22,7		29,1		35,5		54,5	
l_5 tol.	$^{0}_{-0,3}$				$^{0}_{-0,4}$					
l_6	18,8		25		31,3		37,7		59,3	56,8
l_6 tol.	$^{0}_{-0,3}$				$^{0}_{-0,4}$					
$l_7\ ^{0}_{-0,5}$	1,6						2			
r_1	0,6		1,2		2		2,5		3,5	
r_1 tol.	$^{0}_{-0,3}$		$^{0}_{-0,5}$							
r_2 [c] $\ ^{0}_{-0,5}$	0,8		1		1,2		1,5		2	
$r_3\ ^{0}_{-0,5}$	1,6						2			
t_1	0,001				0,002				0,003	
t_2	0,002				0,003				0,004	
t_3	0,12						0,2			
$u\ ^{0}_{-0,1}$	19,1									
$v \pm 0,1$	11,1									
$x\ ^{+0,15}_{0}$	3,75									
$y \pm 0,1$	3,2									
α	8°17'50"									
α tol.	$^{+4"}_{0}$									

[a] d_1: basic diameter enclosed in a gauge plane.

[b] For information only.

[c] Chamfer or radius type of counterbore entrance are possible and limited by diameter d_{11}.

3.3 Shank forms AD and UD

As a complement to Forms A and U, it is possible to add a through hole, e.g. for centric inner coolant supply, as indicated in Figure 2. Those forms are called AD (if provided on Form A) and UD (if provided with Form U). The condition is that d_{10} shall be less or equal to the core diameter of the thread receiving the retention knob.

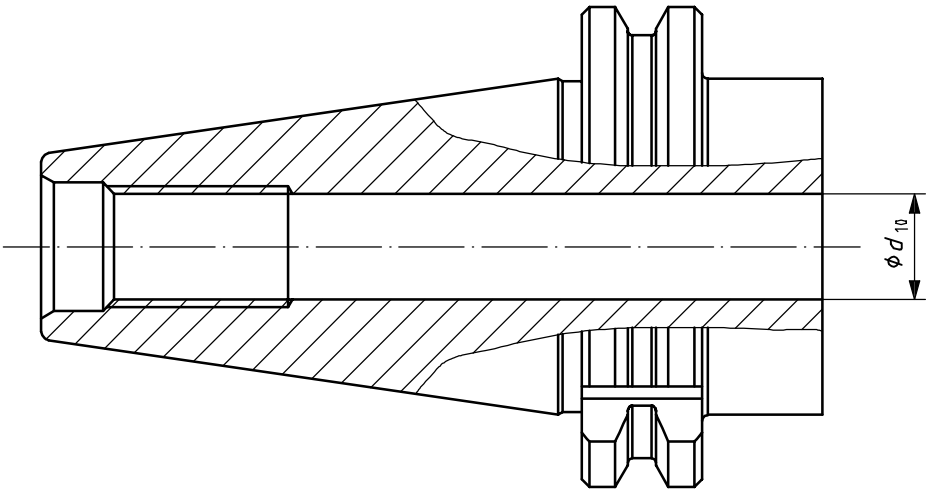


Figure 2 — Shank forms AD and UD

3.4 Shanks forms AF and UF

As a complement to shank forms A and U, it is possible to add two holes at the back of the flange for inner coolant supply, the dimensions of which are indicated in Figure 3 and Table 2. Those forms are called AF (if provided with Form A) and UF (if provided with Form U).

For Forms AF and UF, if an auxiliary connecting bore is needed, it shall be sealed to withstand an operating pressure of up to 5 MPa, of a design that is at the manufacturer's discretion.

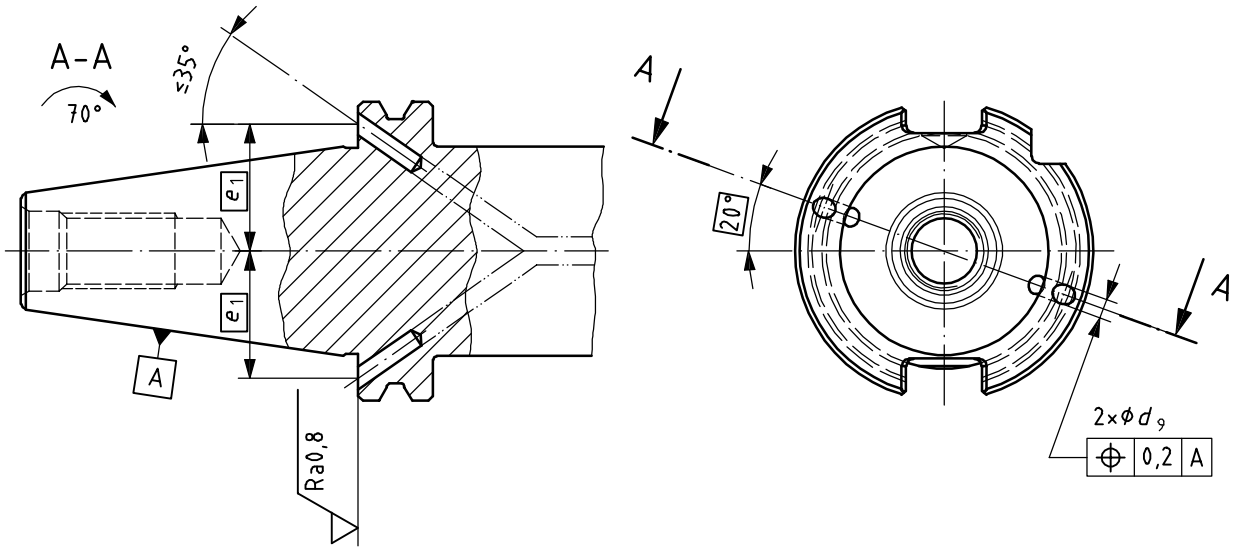


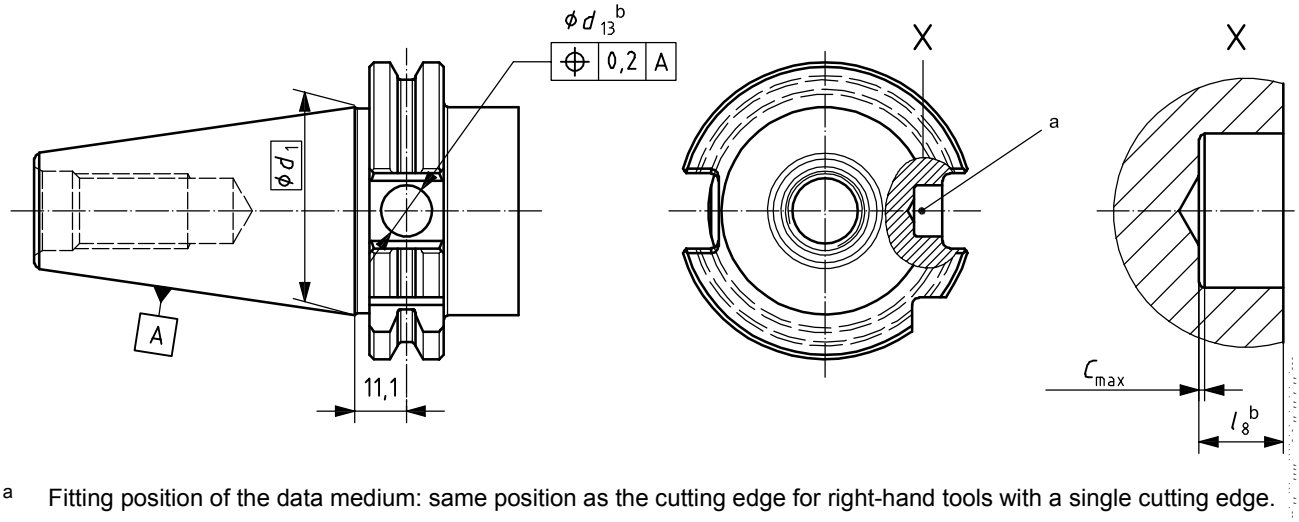
Figure 3 — Shank forms AF and UF

Table 2 — Supplementary dimensions of shanks of forms AF and UF

Shank no.	d_9 max.	e_1
30	4	21
40	4	27
45	5	35
50	6	42
60	8	66

3.5 Shanks with data medium

For the six forms specified in 3.2 to 3.4, a data medium can be added, the dimensions of which are indicated in Figure 4 and Table 3.



a Fitting position of the data medium: same position as the cutting edge for right-hand tools with a single cutting edge.

b Other diameters and depth according to the data medium used.

Figure 4 — Fitting position of data medium

Table 3 — Supplementary dimensions for fitting of data medium

c_{max}	0,3 × 45° or r 0,3 [a]
d_{13}	$10\ ^{+0,09}_{0}$
l_8	$4{,}6\ ^{+0,2}_{0}$
[a] At the discretion of the manufacturer.	

4 Information on material and heat treatment

Tool shanks with a 7/24 taper should be heat treated with considerations for strength, hardness, case depth (if not through hardened). Toughness and wear requirements are to be taken into account.

5 Designation

A tool shank with 7/24 taper in accordance with this part of ISO 7388 shall be designated as follows:

a) “Tool shank”;

b) reference to this part of ISO 7388, i.e. “ISO 7388-1”;

c) a dash;

d) Form A, U, AD, UD, AF or UF;

e) the size;

f) in the case of a design with data medium, a dash and the letter D.

EXAMPLE Designation of a tool shank with 7/24 in accordance with ISO 7388-1, Form A, shank no. 40 with fitting position for a data medium D:

Tool shank ISO 7388-1 — A 40 — D

Bibliography

[1] ISO 9270 [1)], *7/24 tapers for tool shanks for automatic changing — Tapers for spindle noses*

1) It is intended that at the next revision, shanks of forms U, UD, UF, J, JD and LF will also be covered.

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