INTERNATIONAL STANDARD

ISO 10643

First edition
2009-09-15

Dimensions of accessories for cutter arbors with parallel key and tenon drive

Dimensions des équipements pour mandrins porte-fraises à entraînement par clavette et tenon

Reference number
ISO 10643:2009(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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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.

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 10643 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 2, *High speed steel cutting tools and their attachments*.

Introduction

Given that many tools, as well as tool holders for cutting tools and their attachments, use similar accessories, this International Standard is intended to facilitate communication among different types of interface such as Morse taper, 7/24 taper and hollow taper interface.

Dimensions of accessories for cutter arbors with parallel key and tenon drive

1 Scope

This International Standard specifies the dimensions of accessories for cutter arbors with parallel key and tenon drive including parallel key, clutch drive ring, cutter retaining screws and the wrench for cutter retaining screws.

Its also specifies their material and designation.

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 240, *Milling cutters — Interchangeability dimensions for cutter arbors or cutter mandrels*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

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*

3 Dimensions

3.1 General

All dimensions and tolerances are given in millimetres.

The figures are schematic and not intended to specify a given design; only the given dimensions shall be met.

Tolerance not specified shall be tolerance class “m” in accordance with ISO 2768-1 and “K” in accordance with ISO 2768-2.

3.2 Parallel key

Details not given shall be left to the manufacturer's discretion.

The dimensions of the parallel key shall conform to the indications given in Figure 1 and Table 1.

The dimensions of the receiver shall be in accordance with ISO 240.

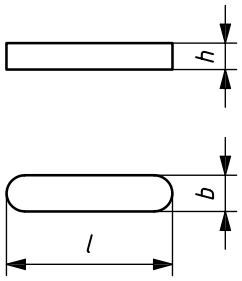

Figure 1 — Parallel key

Table 1 — Dimensions of parallel key

Arbor shaft diameter *d* h6	*b* h9	*h* h9	*l*	
				Tolerance
16	4	4	20	$^{0}_{-0,2}$
22	6	6	25	
27	7	7	25	
32	8	7	28	
40	10	8	32	$^{0}_{-0,3}$
50	12	8	36	
60	14	9	40	

3.3 Clutch drive ring

Details not given shall be left to the manufacturer's discretion.

The dimensions of the clutch drive ring shall conform to the indications given Figure 2 and Table 2.

The dimensions of the receiver shall be in accordance with ISO 240.

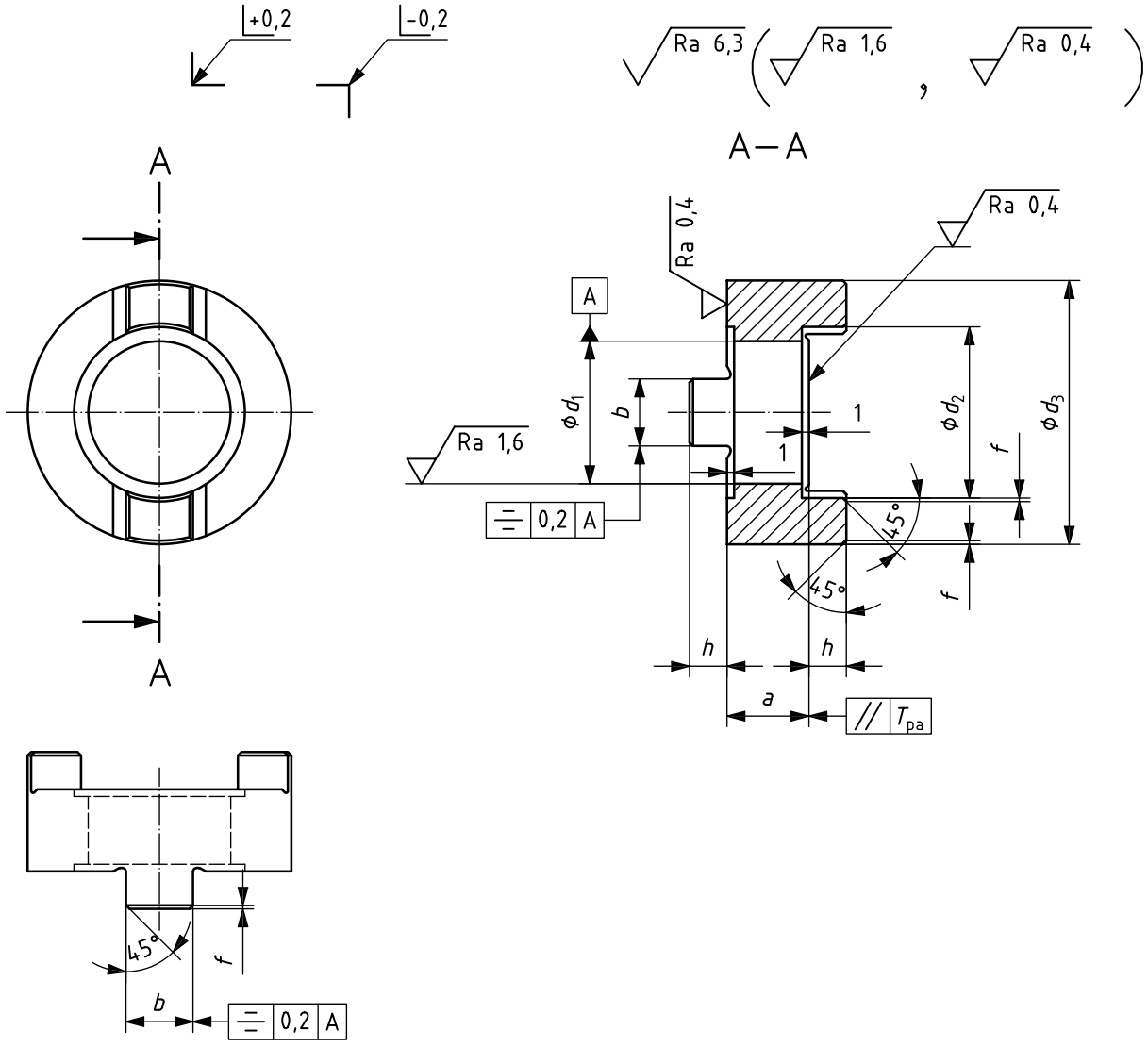

Figure 2 — Clutch drive ring

Table 2 — Dimensions of clutch drive ring

d_1 A11	d_2	d_3	a $^{0}_{-0,2}$	b h11	f		h		T_{PA}
						Deviation		Deviation	
16	19,5	32	10	8	0,6	$^{+0,2}_{0}$	5	$^{0}_{-0,2}$	0,004
22	26	40	12	10	0,6		5,6		
27	31,5	48	12	12	0,8		6,3		
32	37	58	14	14	0,8		7		0,005
40	45	70	14	16	1	$^{+0,3}_{0}$	8		
50	55	90	16	18	1		9		
60	65	110	16	20	1		10		0,006

3.4 Cutter retaining screws

Details not given shall be left to the manufacturer's discretion.

The dimensions of the cutter retaining screws shall conform to the indications given in Figure 3 and Table 3.

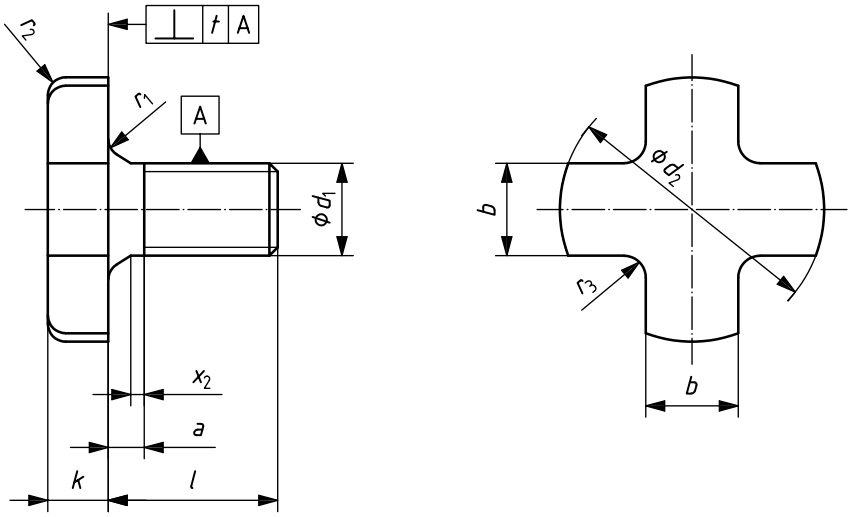

Figure 3 — Cutter retaining screw

Table 3 — Dimensions of cutter retaining screw

d_1	d_2 h13	a max.	b h13	k h13	l	r_1	r_2	r_3	t^a	x_2	**Arbor nominal shaft diameter**
M6	17	2,2	6	5	12	1,2	1	2	0,10	2,7	13
M8	20	3,75	8	6	16	1,6	1	2		3,2	16
M10	28	4,5	10	7	18	2	1,2	3		3,8	22
M12	35	5,25	12	8	22	2,5	1,2	3		4,3	27
M16	42	6	16	9	26	3	1,6	3		5	32
M20	52	7,5	20	10	30	3	1,6	4		6,3	40
M24	63	9	24	12	36	4	2	4		7,5	50
M30	75	10,5	28	14	45	5	2	4		9	60

NOTE See the dimensions in ISO 2780.

[a] The reference value is the thread pitch diameter.

3.5 Wrench for cutter retaining screws

The dimensions of the wrench for cutter retaining screws shall conform to the indications given in Figure 4 and Table 4.

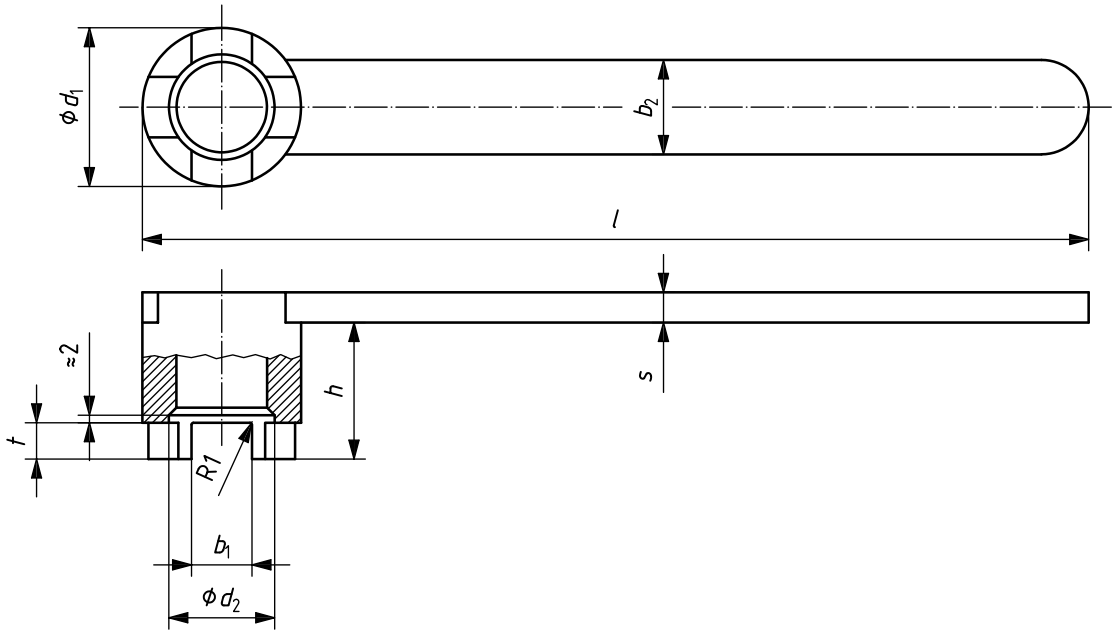

Figure 4 — Wrench for cutter retaining screw

Table 4 — Dimensions of wrench for cutter retaining screws

Size[a]	b_1		b_2	d_1	d_2	h	l	s[b]	t	Test torque	For cutter retaining screws according to Table 3
		Deviations	± 1	± 0,5	± 0,5	± 1	± 3		± 0,2	min.	
13	6,1	$^{+0,2}_{0}$	10	18	12	16	160	5	5,2	20	M6
16	8,1		12	22	15	20	180	5	6,2	53	M8
22	10,1		16	28	19	25	200	6	7,2	94	M10
27	12,1	$^{+0,25}_{0}$	20	35	22	32	225	8	8,5	135	M12
32	16,1		25	42	28	36	250	8	9,5	275	M16
40	20,2		30	52	35	40	280	8	11	520	M20
50	24,2	$^{+0,3}_{0}$	30	63	41	45	315	8	13	830	M24
60	28,2		35	76	51	50	355	10	15	1 500	M30

[a] Size corresponds to the arbor diameter of the shell end mill arbor.

[b] Deviations shall be left to the manufacturer's discretion, depending on the standard used for steel plates.

4 Material

4.1 Parallel key

The choice of material shall be left to the manufacturer's discretion; tensile strength shall be at least 590 N/mm^2.

4.2 Clutch drive ring

The choice of material shall be left to the manufacturer's discretion; tensile strength shall be at least 800 N/mm^2.

Hardness shall be (56 + 4) HRC.

4.3 Cutter retaining screws

The choice of material shall be left to the manufacturer's discretion; steel shall be of property class 10.9 in accordance with ISO 898-1.

4.4 Wrench for cutter retaining screws

The choice of material shall be left to the manufacturer's discretion; tensile strength shall be at least 1 200 N/mm^2.

5 Designation

5.1 Parallel key

A parallel key in accordance with ISO 10643 shall be designated by:

a) “Parallel key”;

b) a reference to this International Standard, i.e. ISO 10643;

c) a hyphen;

d) the width, b, of the parallel key;

e) the multiplication sign $\times$;

f) the height, h, of the parallel key;

g) the multiplication sign $\times$;

h) the length, l, of the parallel key.

EXAMPLE A parallel key of width b = 8 mm, height h = 7 mm and length l = 28 mm is designated as follows:

Parallel key ISO 10643 - 8 × 7 × 28

5.2 Clutch drive ring

A clutch drive ring in accordance with ISO 10643 shall be designated by:

a) “Clutch drive ring”;

b) a reference to this International Standard, i.e. ISO 10643;

c) a hyphen;

d) The diameter, d_1, of the clutch drive ring.

EXAMPLE A clutch drive ring of diameter d_1 = 22 mm is designated as follows:

Clutch drive ring ISO 10643 - 22

5.3 Cutter retaining screw

A cutter retaining screw in accordance with ISO 10643 shall be designated by:

a) “Cutter retaining screw”;

b) a reference to this International Standard, i.e. ISO 10643;

c) a hyphen;

d) the size of the metric thread of the cutter retaining screw, i.e. M12.

EXAMPLE A cutter retaining screw of metric thread M12 is designated as follows:

Cutter retaining screw ISO 10643 - M12

5.4 Wrench for cutter retaining screws

A wrench for cutter retaining screws in accordance with ISO 10643 shall be designated by:

a) “Wrench for cutter retaining screw”;

b) a reference to this International Standard, i.e. ISO 10643;

c) a hyphen;

d) the size of the wrench according to Table 4.

EXAMPLE A wrench for cutter retaining screws of size 16 is designated as follows:

Wrench for cutter retaining screw ISO 10643 - 16

Bibliography

[1] ISO 2780, *Milling cutters with tenon drive — Interchangeability dimensions for cutter arbors — Metric series*

ICS 25.100.01

Price based on 8 pages