
**Cutter arbors with parallel key and tenon
drive —**

**Part 3:
Dimensions and designation of tool
holders with 7/24 taper for automatic tool
changers**

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Mandrins porte-fraise à entraînement par clavette et tenon —

*Partie 3: Dimensions et désignation des porte-outils à conicité 7/24 pour
changement automatique d'outils*

ISO 10649-3:2010

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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 10649-3 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 2, *High speed steel cutting tools and their attachments*.

ISO 10649 consists of the following parts, under the general title *Cutter arbors with parallel key and tenon drive*:

- *Part 1: General dimensions*
- *Part 2: Dimensions and designation of tool holders with hollow taper interface with flange contact surface*
- *Part 3: Dimensions and designation of tool holders with 7/24 taper for automatic tool changers*
- *Part 4: Dimensions and designation of tool holders with 7/24 taper without automatic tool changers*

The dimensions and designations of tool holders with polygonal taper interface with flange contact surface will form the subject of a part 5 and the dimensions and designations of tool holders with modular taper interface with ball track system will form the subject of a part 6.

Introduction

The aim of ISO 10649 (all parts) is to specify the main dimensions for tool holders for this type of interface, and prevent the risk of collision when exchanging the assembled tool within the machine tools.

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Cutter arbors with parallel key and tenon drive —

Part 3:

Dimensions and designation of tool holders with 7/24 taper for automatic tool changers

1 Scope

This part of ISO 10649 specifies the dimensions of cutter arbors with parallel key and tenon drive with 7/24 tapers for automatic tool changer.

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

ISO 7388-1, *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*

ISO 7388-2, *Tool shanks with 7/24 taper for automatic tool changers — Part 2: Dimensions and designation of shanks of forms J, JD and JF*

ISO 10643, *Dimensions of accessories for cutter arbors with parallel key and tenon drive*

ISO 10649-1, *Cutter arbors with parallel key and tenon drive — Part 1: General dimensions*

3 Dimensions

3.1 General

All dimensions and tolerances are given in millimetres. 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.

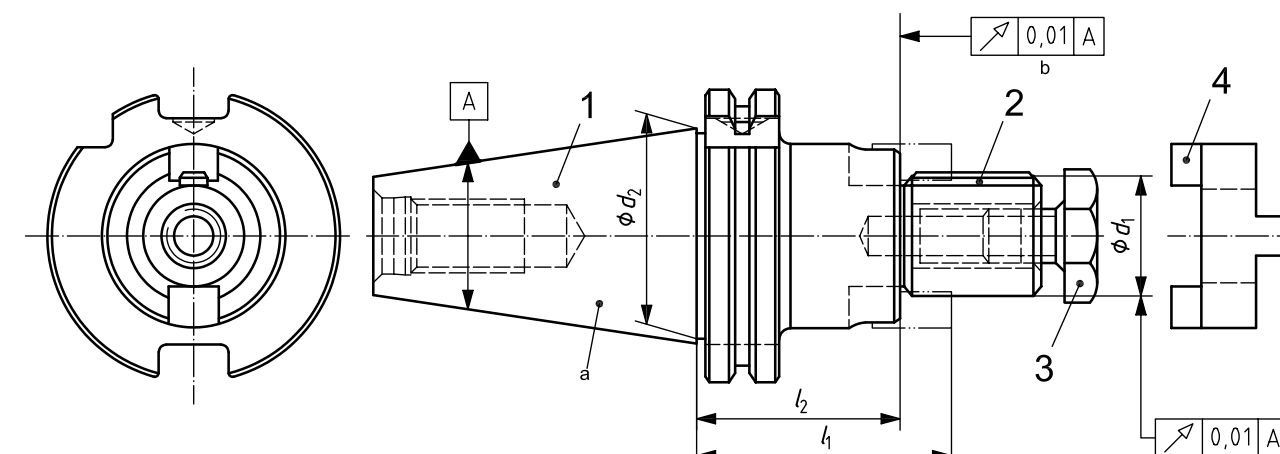
The interchangeability dimensions of the milling cutter bearing on the cutter arbor shall be in conformity with ISO 2780. The retaining screw used shall have the dimensions specified in ISO 2780.

The dimensions of tool interface for arbors with parallel key and tenon drive shall be in accordance with ISO 10649-1.

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

3.2 Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1

The dimensions for arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1 shall be in accordance with the dimensions shown in Figure 1 and given in Table 1.



Key

- 1 tool holder with 7/24 taper in accordance with ISO 7388-1
 - 2 parallel key in accordance with ISO 10643
 - 3 retaining screw in accordance with ISO 10643
 - 4 clutch drive ring in accordance with ISO 10643
- a Taper shank 7/24 according to ISO 7388-1.
b Not convex.

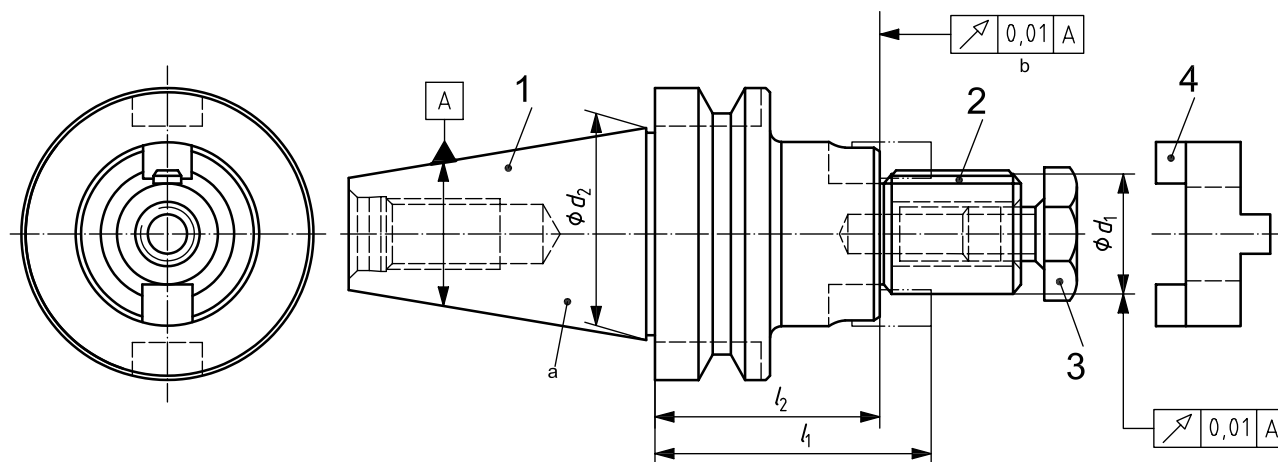
Figure 1 — Arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1

Table 1 — Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1

Dimensions		Shank no.																				
		30				40				45					50							
d_1		16	22	27	32	16	22	27	32	40	16	22	27	32	40	50	16	22	27	32	40	50
d_2		31,75				44,45				57,15					69,85							
l_1	A	50		55		55		60		55				63		55				70		
	U	55				63		70		63			70		75	63		70	75			
l_2	A	40	38	43	41	45	43		46	45	43		41	49	47	45	43		41		54	
	U	45	43		41	53	51		56	53	51		56		59	53	51		56	61	59	

3.3 Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-2

The dimensions for arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-2 shall be in accordance with the dimensions shown in Figure 2 and given in Table 2.



Key

1 tool holder with 7/24 taper in accordance with ISO 7388-2

2 parallel key in accordance with ISO 10643

3 retaining screw in accordance with ISO 10643

4 clutch drive ring in accordance with ISO 10643

a Taper shank 7/24 in accordance with ISO 7388-2

b Not convex.

Figure 2 — Arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-2

Table 2 — Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-2

Shank no.	30				40					45						50					
d_1	16	22	27	32	16	22	27	32	40	16	22	27	32	40	50	16	22	27	32	40	50
d_2	31,75				44,45					57,15						69,85					
l_1	50			60	55			60		63			70		75	70					
l_2	40	38		46	45	43		46		53	51		56		59	60	58		56		54

4 Material

The material is left to the manufacturer's discretion; the tensile strength shall be at least 800 N/mm².

The surface hardness shall be (56 + 4) HRC in the area of the taper surface and the surfaces of the spigot. The hardness depth is left to the manufacturer's discretion.

5 Designation

The cutter arbors with parallel key and tenon drive with 7/24 taper shank for automatic tool changer in accordance with this part of ISO 10649 shall be designated by:

- a) "Arbor";
- b) the reference to this part of ISO 10649, i.e. ISO 10649-3:2010;
- c) a hyphen;
- d) the form of the shank in accordance with ISO 7388-1 or ISO 7388-2 (i.e. forms A, U, AD, UD, AF, UF, J, JD or JF);
- e) the shank number;
- f) a hyphen;
- g) the diameter of cutter d_1 .

EXAMPLE Designation of an arbor with 7/24 taper shank for automatic tool changer, shank No. 45 form A, cutter arbor diameter $d_1 = 22$ mm, with parallel key, clutch drive ring and cutter retaining screw:

Arbor ISO 10649-3 - A 45 - 22

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6 Delivery conditions

The cutter arbors with parallel key and tenon drive with 7/24 taper shank for automatic tool changer in accordance with this part of ISO 10649 shall be delivered with at least the following:

- a parallel key in accordance with ISO 10643;
- a clutch drive ring in accordance with ISO 10643;
- a cutter retaining screw in accordance with ISO 10643.

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