

BS ISO 10649-3:2013



BSI Standards Publication

## Cutter arbors with parallel key and tenon drive

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

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**National foreword**

This British Standard is the UK implementation of ISO 10649-3:2013. It supersedes BS ISO 10649-3:2010 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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 changer**

*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*





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# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Dimensions</b> .....	<b>1</b>
3.1 General.....	1
3.2 Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1.....	2
3.3 Dimensions of arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-2.....	2
<b>4 Material</b> .....	<b>3</b>
<b>5 Designation</b> .....	<b>3</b>
<b>6 Delivery conditions</b> .....	<b>4</b>
<b>Annex A (informative) Relationship between the symbols of this part of ISO 10649 and the ISO 13399 series</b> .....	<b>5</b>
<b>Bibliography</b> .....	<b>6</b>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives).

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The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 2, *High speed steel cutting tools and their attachments*.

This second edition cancels and replaces the first edition (ISO 10649-3:2010), of which it constitutes a minor revision with the following changes:

- addition of [Annex A](#), which gives the relationship between the symbols of this part of ISO 10649 and the symbols according to the ISO 13399 series.

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 taper interface with flange contact surface*
- *Part 3: Dimensions and designation of tool holders with 7/24 taper for automatic tool changer*
- *Part 4: Dimensions and designation of tool holders with 7/24 taper without automatic tool changer*
- *Part 5: Dimensions and designation of tool holders with polygonal taper interface with flange contact surface*
- *Part 6: Dimensions and designation of tool holders with modular taper interface with ball track system*

## 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.





# Cutter arbors with parallel key and tenon drive —

## Part 3:

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

## 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 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 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.

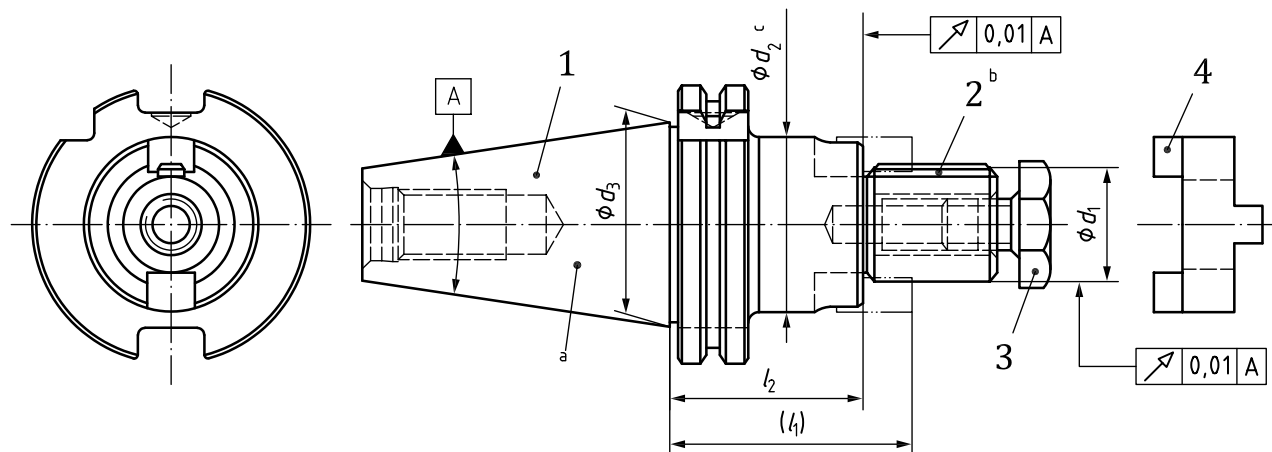
The interchangeability dimensions of the milling cutter bearing on the cutter arbor shall be in conformity with ISO 2780. The retaining screw used shall have the dimensions specified in ISO 2780.

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.
- c The values of  $d_2$  shall be as given in ISO 10649-1.

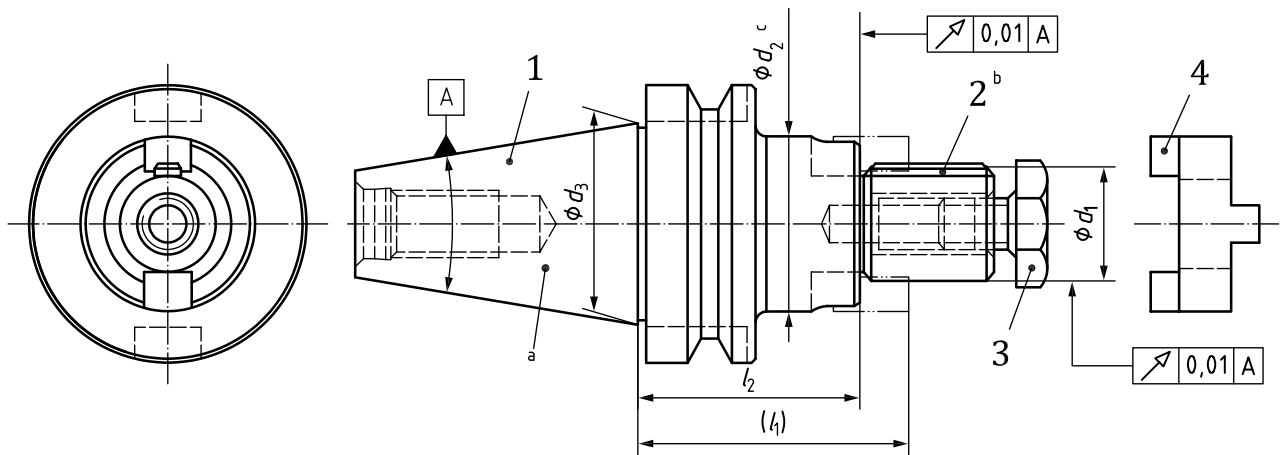
**Figure 1 — Arbors with 7/24 taper shanks for automatic tool changers in accordance with ISO 7388-1**

**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
$d_3$	31,75				44,45				57,15				69,85								
$l_1$	A	50	55		55	60		55	63		55	63	70	75	55	63	70	75		70	
	U	55			63	70		63	70	75	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	53	51	56	59	53	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.
- c The values of  $d_2$  shall be as given in ISO 10649-1.

**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**

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
$d_3$	31,75				44,45				57,15				69,85								
$l_1$	50		60		55		60		63		70		75		70						
$l_2$	40	38	46	45	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/mm<sup>2</sup>.

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 10649-3:2013;

- 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 - A45 - 22**

## 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.

## Annex A (informative)

### Relationship between the symbols of this part of ISO 10649 and the ISO 13399 series

For the relationship between the symbols of this part of ISO 10649 and symbols according to the ISO 13399 series, see [Table A.1](#).

**Table A.1 — Relationship between symbols in this part of ISO 10649 and  
the ISO 13399 series**

Symbol in this part of ISO 10649 (ISO 10649-3)	Reference in this part of ISO 10649 (ISO 10649-3)	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series BSU code
$d_1$	<a href="#">Figure 1</a> and <a href="#">Figure 2</a>	shank diameter	DCONWS	ISO/TS 13399-3 71CF29862B277
$d_2$	<a href="#">Figure 1</a> and <a href="#">Figure 2</a>	body diameter	BD	ISO/TS 13399-3 7ED689AF7D1D
$d_3$	<a href="#">Figure 1</a> and <a href="#">Figure 2</a>	connection size code	CZC	ISO/TS 13399-60 71FC193318002
$l_1$	<a href="#">Figure 1</a> and <a href="#">Figure 2</a>	functional length	LF	ISO/TS 13399-3 71DCD39338974
$l_2$	<a href="#">Figure 1</a> and <a href="#">Figure 2</a>	functional length (2)	LF (2)	ISO/TS 13399-3 71DCD39338974_2

## Bibliography

- [1] ISO 13399 (all parts), *Cutting tool data representation and exchange*









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