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

Part 5:

**Dimensions and designation of tool  
holders with polygonal taper interface  
with flange contact surface**

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*Mandrins porte-fraise à entraînement par clavette et tenon —*

*Partie 5: Dimensions et désignation des porte-outils avec interface à  
cône polygonal avec face d'appui*

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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 10649-5 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*
- 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.

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# Cutter arbors with parallel key and tenon drive —

## Part 5: Dimensions and designation of tool holders with polygonal taper interface with flange contact surface

### 1 Scope

This part of ISO 10649 specifies the dimensions of cutter arbors with parallel key and tenon drive with polygonal taper interface (PSC) with flange contact surface.

The relationship between symbols in this part of ISO 10649 and the ISO 13399 series is given for information in Annex A.

### 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*  
<https://standards.iteh.ai/catalog/standards/sist/d980918e-8657-4041-ad11-404e9bd0a197-4047-97-112>

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

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*

ISO 26623-1, *Polygonal taper interface with flange contact surface — Part 1: Dimensions and designation of shanks*

### 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.

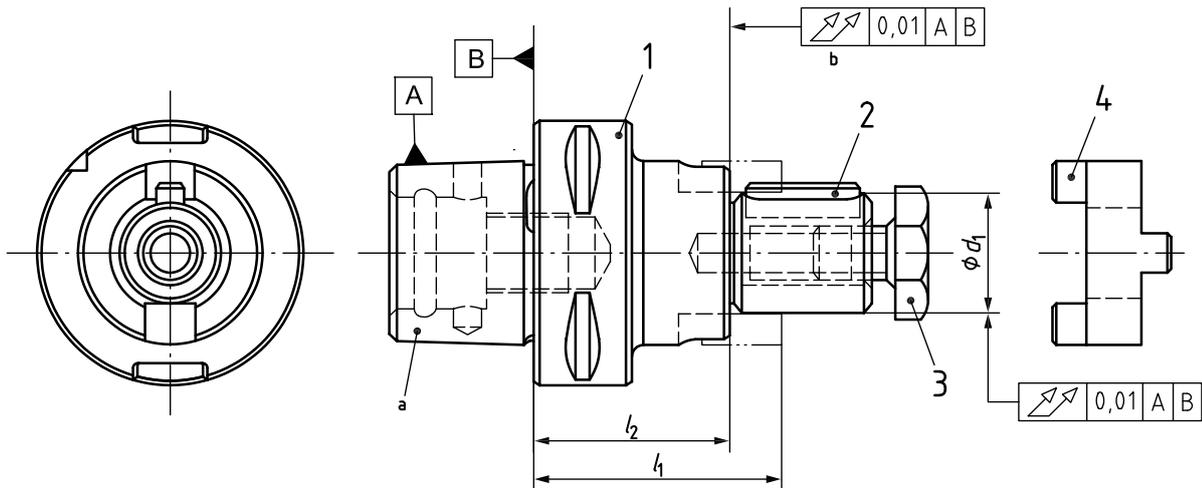
The interchangeability dimensions of the milling cutter bearing on the cutter arbors shall be in accordance with ISO 2780.

The dimensions of the tool interface for arbors with parallel key and tenon drive shall be in accordance with dimensions given in 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 Cutter arbors with parallel key and tenon drive with polygonal taper interface

The dimensions for cutter arbors with parallel key and tenon drive with polygonal taper interface with flange contact surface shall be in accordance with the dimensions shown in Figure 1 and given in Table 1.



**Key**

- 1 tool holder with PSC in accordance with ISO 26623-1
- 2 parallel key in accordance with ISO 10643
- 3 cutter retaining screw in accordance with ISO 10643
- 4 clutch drive ring in accordance with ISO 10643
- a Polygonal taper interface (PSC) in accordance with ISO 26623-1.
- b Not convex.

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Figure 1 — Cutter arbors with parallel key and tenon drive with polygonal taper interface  
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Table 1 — Dimensions

PSC no.	32		40		50				63				80					
	16	22	16	22	16	22	27	32	16	22	27	32	40	16	22	27	32	40
$d_1$	16	22	16	22	16	22	27	32	16	22	27	32	40	16	22	27	32	40
$l_1$	40	45	45	50	45	50	50	55	50	50	55	55	60	55	60	60	65	65
$l_2$	30	33	35	38	35	38	38	41	40	38	43	41	46	45	48	48	51	51

**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 polygonal taper interface in accordance with this part of ISO 10649 shall be designated by:

- a) “Arbor”;
- b) a reference to this part of ISO 10649, i.e. ISO 10649-5;
- c) a hyphen;
- d) PSC;
- e) a hyphen;

- f) the shank number;
- g) a hyphen;
- h) the cutter diameter,  $d_1$ .

EXAMPLE A regular contact surface arbor with polygonal taper interface with shank No. 63, cutter diameter  $d_1 = 16$  mm, clutch drive ring and cutter retaining screw is designated as follows:

**Arbor ISO 10649-5 - PSC - 63 - 16**

## 6 Delivery conditions

The cutter arbors with parallel key and tenon drive with polygonal taper interface in accordance with this part of ISO 10649 shall be delivered with at least the following:

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

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## Annex A (informative)

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

For the relationship between symbols in 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 10649-5)	Reference in this part of ISO 10649 (ISO 10649-5)	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	ISO 13399 series BSU code
$d_1$	Figure 1	Shank diameter	DMM	ISO/TS 13399-3 71CF29862B277
$l_1$	Figure 1	Functional length	LF	ISO/TS 13399-3 71DCD39338974
$l_2$	Figure 1	Functional length secondary	LFS	ISO/TS 13399-3 71D078F5BEDBE

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- [2] ISO/TS 13399-2, *Cutting tool data representation and exchange — Part 2: Reference dictionary for the cutting items*
- [3] ISO/TS 13399-3, *Cutting tool data representation and exchange — Part 3: Reference dictionary for tool items*
- [4] ISO/TS 13399-4, *Cutting tool data representation and exchange — Part 4: Reference dictionary for adaptive items*
- [5] ISO/TS 13399-5, *Cutting tool data representation and exchange — Part 5: Reference dictionary for assembly items*
- [6] ISO/TS 13399-50, *Cutting tool data representation and exchange — Part 50: Reference dictionary for reference systems and common concepts*
- [7] ISO/TS 13399-60, *Cutting tool data representation and exchange — Part 60: Reference dictionary for connection systems*
- [8] ISO/TS 13399-100, *Cutting tool data representation and exchange — Part 100: Definitions, principles and methods for reference dictionaries*
- [9] ISO/TS 13399-150, *Cutting tool data representation and exchange — Part 150: Usage guidelines*

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