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**Milling cutters — Designation —**

**Part 2:**

Shank type and bore type milling cutters  
with indexable inserts

*Fraises — Désignation —*  
**iTeh STANDARD PREVIEW**  
*Partie 2: Fraises à queue et fraises à trou à plaquettes amovibles*  
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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.

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.

International Standard ISO 11529-2 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

This first edition of ISO 11529-2 cancels and replaces ISO 7406:1986 and ISO 7848:1986, which have been technically revised.

ISO 11529 consists of the following parts, under the general title *Milling cutters* — *Designation*:

- *Part 1: Shank type end mills of solid or tipped design* <https://standards.iteh.ai/catalog/standards/sist/71d4c08a-b5b3-4783-bbcf-11529-2:1998>
- *Part 2: Shank type and bore type milling cutters with indexable inserts*

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# Milling cutters — Designation —

## Part 2:

## Shank type and bore type milling cutters with indexable inserts

### 1 Scope

This part of ISO 11529 establishes a designation system for shank type and bore type milling cutters embodying hardmaterial indexable inserts, with the purpose of simplifying communication between users and suppliers of such tools.

### 2 Summary explanation of the designation system

Shank type and bore type milling cutters are designated by codes comprising designation symbols which identify the important features of the milling cutters.

Extension to the designation code to include manufacturer's or supplier's information about the milling cutters is described in clause 4.

No addition to or extension of the designation system given in this part of ISO 11529 shall be made without consulting with Technical Committee ISO/TC 29 and obtaining its agreement.

The symbols defined by this part of ISO 11529 are:

#### Position Definition of designation symbols

|    |                                                                                                                           |
|----|---------------------------------------------------------------------------------------------------------------------------|
| 1  | Designation symbol (letter) identifying the design of milling cutter (see 3.1)                                            |
| 2  | Designation symbol (letter) identifying the type of milling cutter (see 3.2)                                              |
| 3  | Designation symbol (number) identifying the cutting edge angle $\kappa_r$ (see 3.3)                                       |
| 4  | Designation symbol (letter) identifying the shape of insert (see 3.4)                                                     |
| 5  | Designation symbol (number) identifying the diameter, $\varnothing$ (see 3.5)                                             |
| 6  | Designation symbol (letter) identifying the hand of cutting (see 3.6)                                                     |
| 7  | Designation symbol (number) identifying the maximum cutting depth $a_p$ (see 3.7)                                         |
| 8  | Designation symbol (letter) identifying the orientation of the pockets for indexable inserts in milling cutters (see 3.8) |
| 9  | Designation symbol (number) identifying the number of effective cutting edges (see 3.9)                                   |
| 10 | Designation symbol (letter) identifying the type of shank or bore (see 3.10)                                              |
| 11 | Designation symbol (number) identifying the size of shank or bore (see 3.11)                                              |

#### EXAMPLE

|          |          |           |          |            |          |            |          |           |          |           |
|----------|----------|-----------|----------|------------|----------|------------|----------|-----------|----------|-----------|
| 1        | 2        | 3         | 4        | 5          | 6        | 7          | 8        | 9         | 10       | 11        |
| <b>S</b> | <b>A</b> | <b>75</b> | <b>S</b> | <b>100</b> | <b>R</b> | <b>010</b> | <b>A</b> | <b>08</b> | <b>S</b> | <b>32</b> |

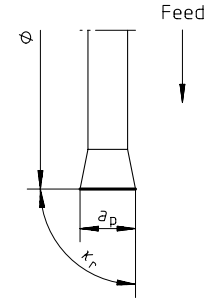
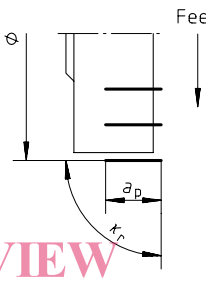
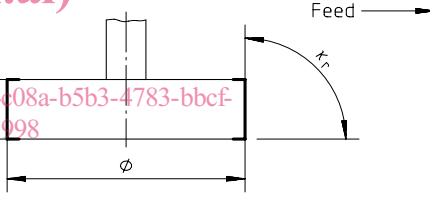
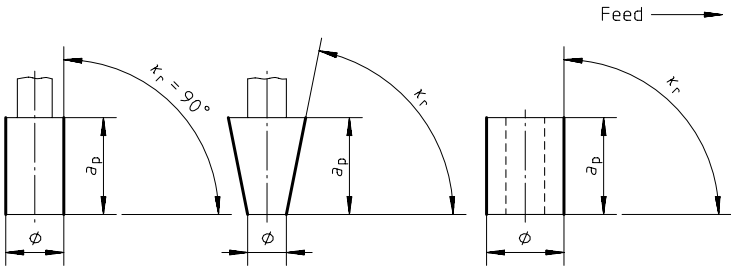
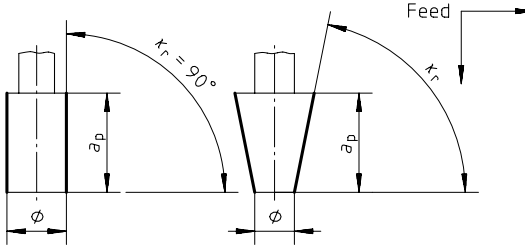
### 3 Designation symbols

#### 3.1 Designation symbol identifying design of milling cutter — Position 1

| Designation symbol | Design                                    |
|--------------------|-------------------------------------------|
| <b>C</b>           | Top clamp                                 |
| <b>P</b>           | Clamping, insert with hole                |
| <b>S</b>           | Clamping with screw, insert with hole     |
| <b>T</b>           | Tangentially mounted insert, with hole    |
| <b>V</b>           | Tangentially mounted insert, without hole |
| <b>W</b>           | Wedge clamping, insert without hole       |
| <b>X</b>           | Special feature                           |

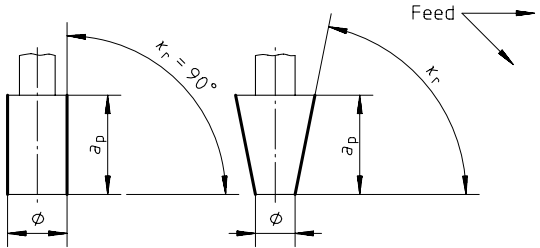
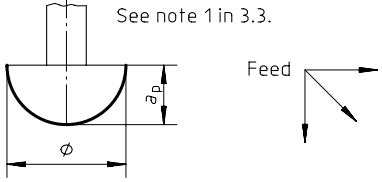
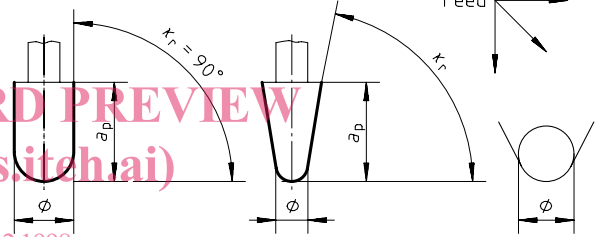
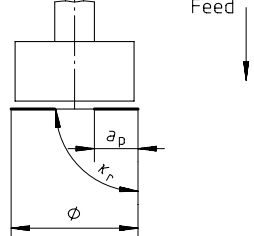
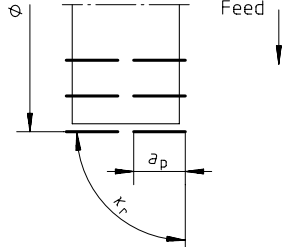
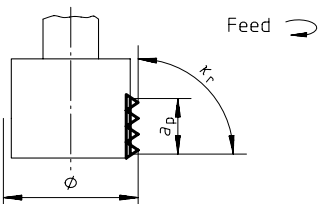
#### 3.2 Designation symbol identifying type of milling cutter — Position 2

| Designations symbol | Type of milling cutter                                        | Shape                                                                                                                                                                                                                                                                                                       |
|---------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b>            | Face mill<br>Square shoulder face mill<br>$a_p < \varnothing$ | <p>ISO 11529-2:1998<br/> <a href="https://standards.iteh.ai/catalog/standards/sis/2114c08a-15b3-4783-0bcf-0a573e0578/iso-11529-2:1998">https://standards.iteh.ai/catalog/standards/sis/2114c08a-15b3-4783-0bcf-0a573e0578/iso-11529-2:1998</a></p> <p><math>\kappa_r = 00</math><br/>See note 1 in 3.3.</p> |
| <b>B</b>            | Face mill<br>Square shoulder face mill<br>$a_p < \varnothing$ | <p><math>\kappa_r = 00</math><br/>See note 1 in 3.3.</p>                                                                                                                                                                                                                                                    |
| <b>C</b>            | Full side and face mill<br>$a_p < \varnothing$                |                                                                                                                                                                                                                                                                                                             |

| Designation symbol | Type of milling cutter                                                                                                                                                  | Shape                                                                                |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <p><b>D</b></p>    | <p>Slitting cutter</p> <p><math>a_p &lt; \varnothing</math></p>                                                                                                         |   |
| <p><b>E</b></p>    | <p>Half side and face mill</p> <p><math>a_p &lt; \varnothing</math></p>                                                                                                 |  |
| <p><b>F</b></p>    | <p>T-slot cutter</p> <p><math>a_p &lt; \varnothing</math></p>                                                                                                           |  |
| <p><b>G</b></p>    | <p>End mill — side cutting (<math>\kappa_r = 90^\circ</math>)</p> <p>Tapered end mill- side cutting</p> <p>Slab mill</p> <p><math>a_p &gt; \varnothing</math></p>       |  |
| <p><b>H</b></p>    | <p>End mill — side and centre cutting (<math>\kappa_r = 90^\circ</math>)</p> <p>Tapered end mill — side and centre cutting</p> <p><math>a_p &gt; \varnothing</math></p> |  |

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| Designation symbol | Type of milling cutter                                                                                                                                                                                        | Shape                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>J</b></p>    | <p>End mill — side cutting and ramping (<math>\kappa_r = 90^\circ</math>)</p> <p>Tapered end mill- side cutting and ramping</p> <p><math>a_p &gt; \varnothing</math></p>                                      |  <p>The diagram shows two types of milling cutters. On the left is a standard end mill with a cutting angle <math>\kappa_r = 90^\circ</math>. On the right is a tapered end mill with a cutting angle <math>\kappa_r</math>. Both diagrams show the cutting depth <math>a_p</math> and the diameter <math>\varnothing</math>. A 'Feed' arrow indicates the direction of movement.</p>                                      |
| <p><b>K</b></p>    | <p>Ball-nosed end mill</p> <p><math>a_p \leq 0,5 \varnothing</math></p>                                                                                                                                       |  <p>The diagram shows a ball-nosed end mill with a semi-circular tip. The cutting depth is <math>a_p</math> and the diameter is <math>\varnothing</math>. The cutting angle is <math>\kappa_r = 00</math>. A 'Feed' arrow indicates the direction of movement. Text above the diagram says: <math>\kappa_r = 00</math> See note 1 in 3.3.</p>                                                                              |
| <p><b>L</b></p>    | <p>Ball-nosed cylindrical end mill — side and centre cutting (<math>\kappa_r = 90^\circ</math>)</p> <p>Ball-nosed tapered end mill — side and centre cutting</p> <p><math>a_p &gt; 0,5 \varnothing</math></p> |  <p>The diagram shows three types of milling cutters. On the left is a ball-nosed cylindrical end mill with a cutting angle <math>\kappa_r = 90^\circ</math>. In the middle is a ball-nosed tapered end mill with a cutting angle <math>\kappa_r</math>. On the right is a side view of a ball-nosed cylindrical end mill with diameter <math>\varnothing</math>. A 'Feed' arrow indicates the direction of movement.</p> |
| <p><b>M</b></p>    | <p>Spot facing cutter</p> <p>centre cutting = <math>a_p = 0,5 \varnothing</math></p> <p>not centre cutting = <math>a_p &lt; 0,5 \varnothing</math></p>                                                        |  <p>The diagram shows a spot facing cutter with a flat top. The cutting depth is <math>a_p</math> and the diameter is <math>\varnothing</math>. The cutting angle is <math>\kappa_r</math>. A 'Feed' arrow indicates the direction of movement.</p>                                                                                                                                                                      |
| <p><b>P</b></p>    | <p>Double half side and face mill</p> <p><math>a_p &lt; \varnothing</math></p>                                                                                                                                |  <p>The diagram shows a double half side and face mill with two cutting edges. The cutting depth is <math>a_p</math> and the diameter is <math>\varnothing</math>. The cutting angle is <math>\kappa_r</math>. A 'Feed' arrow indicates the direction of movement.</p>                                                                                                                                                   |
| <p><b>T</b></p>    | <p>Thread milling cutter</p>                                                                                                                                                                                  |  <p>The diagram shows a thread milling cutter with a thread profile. The cutting depth is <math>a_p</math> and the diameter is <math>\varnothing</math>. The cutting angle is <math>\kappa_r</math>. A 'Feed' arrow indicates the direction of movement.</p>                                                                                                                                                             |

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### 3.3 Designation symbol identifying cutting edge angle $\kappa_r$ — Position 3

The symbol identifying the cutting edge angle is a two-digit number, corresponding to the nominal cutting edge angle, in degrees, and omitting any decimals.  $\kappa_r$  is defined for the various types of milling cutter and end mill in 3.2, and in ISO 3002-1.

#### EXAMPLE

Cutting edge angle 75°: symbol 75

For cutters with round inserts and end mills of type K, the symbol identifying the cutting edge angle shall be replaced by 00 (double zero).

If  $\kappa_r$  is a decimal value, the symbol identifying the cutting edge angle shall be replaced by XX, and the actual value shown as manufacturer's information (see clause 4).

### 3.4 Designation symbol identifying the shape of insert — Position 4

| Designation symbol | Insert shape                                         | Insert type                         |
|--------------------|------------------------------------------------------|-------------------------------------|
| <b>H</b>           | Hexagonal                                            | Equilateral and equiangular         |
| <b>O</b>           | Octogonal                                            |                                     |
| <b>P</b>           | Pentagonal                                           |                                     |
| <b>S</b>           | Square                                               |                                     |
| <b>T</b>           | Triangular                                           |                                     |
| <b>C</b>           | Rhombic with 80° included angle                      | Equilateral but non-equiangular     |
| <b>D</b>           | Rhombic with 55° included angle                      |                                     |
| <b>E</b>           | Rhombic with 75° included angle                      |                                     |
| <b>M</b>           | Rhombic with 86° included angle                      |                                     |
| <b>V</b>           | Rhombic with 35° included angle                      |                                     |
| <b>W</b>           | Hexagonal with 80° included angle                    |                                     |
| <b>L</b>           | Rectangular                                          | Non-equilateral but equiangular     |
| <b>A</b>           | Parallelogram-shaped with 85° included angle         | Non-equilateral and non-equiangular |
| <b>B</b>           | Parallelogram-shaped with 82° included angle         |                                     |
| <b>K</b>           | Parallelogram-shaped with 55° included angle         |                                     |
| <b>R</b>           | Round                                                | Round                               |
| <b>X</b>           | Cutters equipped with other shapes of inserts        | —                                   |
| <b>Y</b>           | Cutters equipped with more than one shape of inserts | —                                   |

NOTES

- The included angle is always the smaller angle.
- This table is extracted from ISO 1832, except for symbols X and Y.

### 3.5 Designation symbol identifying the diameter, $\varnothing$ — Position 5

The definition of the diameter of milling cutters is shown in the drawings in clause 3.2 (position 2).

The number symbol identifying the diameter of milling cutter or end mill is a three digit number and corresponds to the diameter in millimetres.

EXAMPLES

Milling cutters or end mill — Diameter 32 mm: symbol 032  
 Milling cutters or end mill — Diameter 125 mm: symbol 125

**3.6 Designation symbol identifying hand of cutting — Position 6**

The symbol for hand of cutting of milling cutter is:

| Letter symbol | Hand of cutting of milling cutter |
|---------------|-----------------------------------|
| L             | Left                              |
| R             | Right                             |
| N             | Neutral                           |

**3.7 Designation symbol identifying the maximum cutting depth or width  $a_p$  — Position 7**

The symbol identifying the maximum cutting depth or width,  $a_p$ , (see definition in position 2, and in ISO 3002-3) is a three-digit number. If the value of  $a_p$  is an integer, it is given in millimetres for all types of cutters. If not,  $a_p$  may be given as follows: "T" followed by the value in tenths (1/10ths) mm. The latter possibility only applies if  $a_p$  is less than 10 mm.

EXAMPLES

Maximum cutting depth or width 105 mm: symbol 105  
 Maximum cutting depth or width 80 mm: symbol 080  
 Maximum cutting depth or width 7,5 mm: symbol T75

NOTE —  $a_p$  is described in ISO 3002-3 as "back engagement of the cutting edge".

**3.8 Designation symbol identifying the orientation of the pockets for indexable inserts in milling cutters — Position 8**

The symbol identifying the orientation of insert pockets depends on a combination of tool orthogonal rake and tool cutting edge inclination when inserts without chipbreakers are clamped in milling cutters. The symbols are:

| Designation symbol | Tool orthogonal rake<br>$\gamma_0$ | Tool cutting edge inclination<br>$\lambda_s$ |
|--------------------|------------------------------------|----------------------------------------------|
| A                  | 0° or + ve                         | 0° or + ve                                   |
| B                  | 0° or + ve                         | - ve                                         |
| C                  | - ve                               | 0° or + ve                                   |
| D                  | - ve                               | - ve                                         |

**3.9 Designation symbol identifying the number of effective cutting edges — Position 9**

The symbol identifying the number of cutting edges is a two-digit number corresponding to the number of effective cutting edges.

EXAMPLES

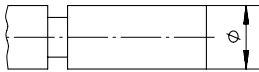
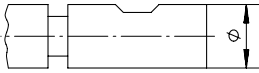
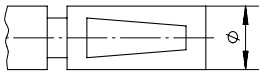
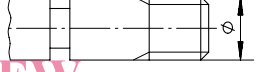
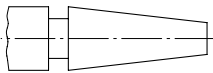
12 effective cutting edges: symbol 12  
 2 effective cutting edges: symbol 02

NOTE — The number of effective cutting edges is defined as being the number of cutting edges used to calculate the feed per tooth in the direction of feed motion from which  $\kappa_r$  is defined.



### 3.10 Designation symbol identifying type of shank or bore — Position 10

#### 3.10.1 Designation symbol identifying type of shank

| Designation symbol | Type of shank                                                                                                                                                                                                                                                                              | Figure                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>A</b>           | Plain cylindrical shank (ISO 338-1)<br><br>NOTE — The length may be greater than specified in ISO 3338-1, i.e. for power chucks.                                                                                                                                                           |    |
| <b>B</b>           | Flatted cylindrical shank (ISO 3338-2)                                                                                                                                                                                                                                                     |    |
| <b>C</b>           | Cylindrical shanks with 2° angular flat (whistle notch shank)                                                                                                                                                                                                                              |    |
| <b>D</b>           | Threaded cylindrical shank (ISO 3338-3)                                                                                                                                                                                                                                                    |   |
|                    | Morse taper shank, type A (ISO 296)<br><br>ISO 11529-2:1998<br><a href="https://standards.iteh.ai/catalog/standards/sist/71d4c08a-b5b3-4783-bbcf-0a573efe0578/iso-11529-2-1998">https://standards.iteh.ai/catalog/standards/sist/71d4c08a-b5b3-4783-bbcf-0a573efe0578/iso-11529-2-1998</a> |  |