INTERNATIONAL STANDARD

ISO 11529-2

Second edition
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Milling cutters — Designation —

Part 2: Shank-type and bore-type milling cutters with indexable inserts

Fraises — Désignation —

Partie 2: Fraises à queue et fraises à trou à plaquettes amovibles

Reference number
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Foreword

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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 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 second edition cancels and replaces the first edition (ISO 11529-2:1998), which has been technically revised. In particular, it incorporates in 4.10.1 the addition of hollow taper shanks (HSK), types A and C.

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*

— *Part 2: Shank-type and bore-type milling cutters with indexable inserts*

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- and bore-type milling cutters embodying hard-material, indexable inserts, with the purpose of simplifying communication between the users and suppliers of such tools.

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 3002-1:1982, *Basic quantities in cutting and grinding — Part 1: Geometry of the active part of cutting tools — General terms, reference systems, tool and working angles, chip breakers*

ISO 3002-3:1984, *Basic quantities in cutting and grinding — Part 3: Geometric and kinematic quantities in cutting*

3 Summary explanation of the designation system

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

Extensions to the designation codes to include manufacturer's or supplier's information about the milling cutters is described in Clause 5.

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 4.1)
2	Designation symbol (letter) identifying the type of milling cutter (see 4.2)
3	Designation symbol (number) identifying the cutting-edge angle, κ_r (see 4.3)
4	Designation symbol (letter) identifying the shape of insert (see 4.4)
5	Designation symbol (number) identifying the diameter, ∅ (see 4.5)
6	Designation symbol (letter) identifying the hand of cutting (see 4.6)

7 Designation symbol (number) identifying the maximum cutting depth or width, a_p (see 4.7)

8 Designation symbol (letter) identifying the orientation of the pockets for indexable inserts in milling cutters (see 4.8)

9 Designation symbol (number) identifying the number of effective cutting edges (see 4.9)

10 Designation symbol (letter) identifying the type of shank or bore (see 4.10)

11 Designation symbol (number) identifying the size of shank or bore (see 4.11)

EXAMPLE

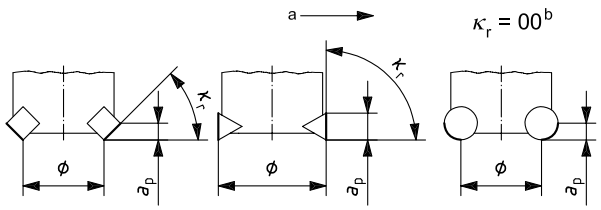
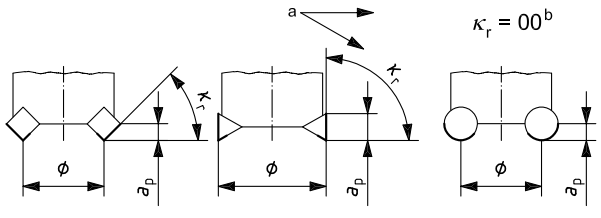
1	2	3	4	5	6	7	8	9	10	11
S	**A**	**75**	**S**	**100**	**R**	**010**	**A**	**08**	**S**	**32**

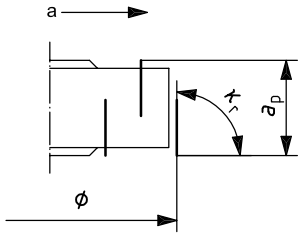
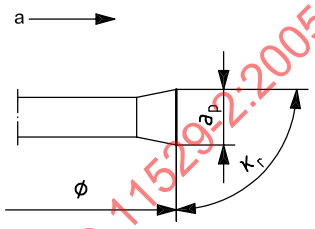
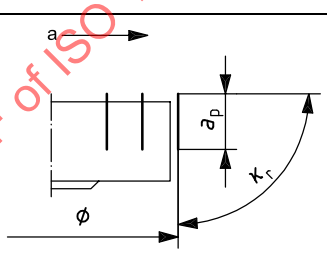
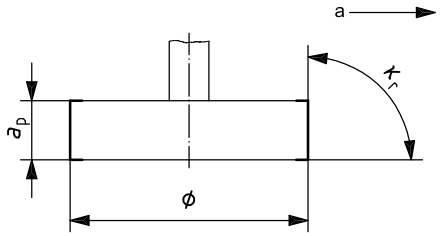
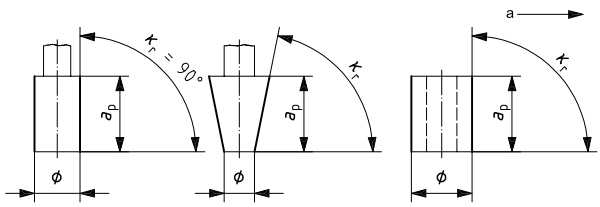
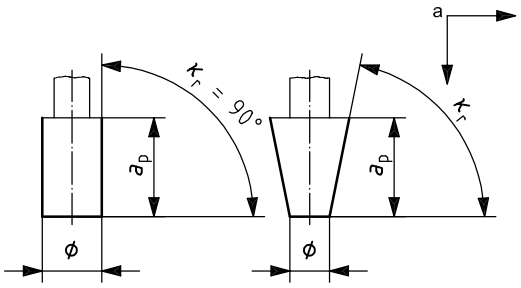
4 Designation symbols

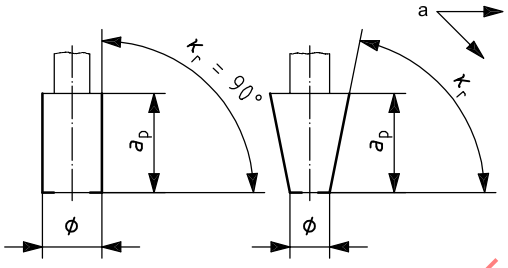
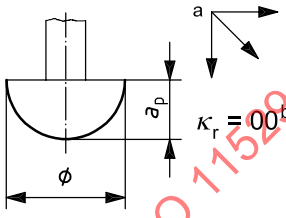
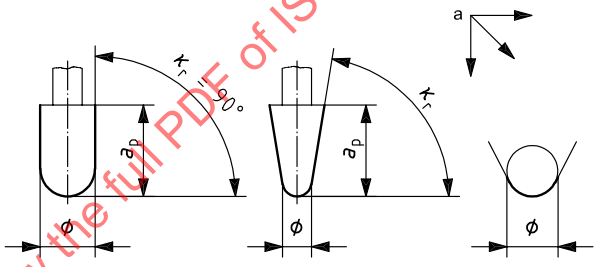
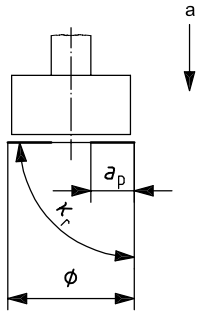
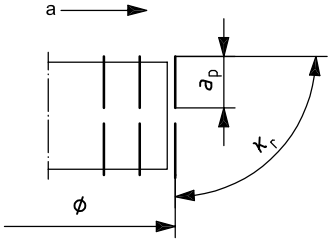
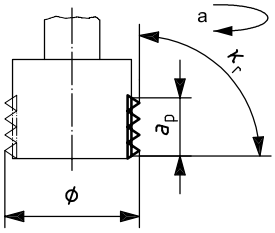
4.1 Designation symbol identifying design of milling cutter — Position 1

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

4.2 Designation symbol identifying type of milling cutter — Position 2

Designation symbol	Type of milling cutter	Shape
A	Face mill Square shoulder face mill $a_p < \varnothing$	
B	Face mill Square shoulder face mill $a_p < \varnothing$	

Designation symbol	Type of milling cutter	Shape
C	Full side and face mill $a_p < \varnothing$	
D	Slitting cutter $a_p < \varnothing$	
E	Half-side and face mill $a_p < \varnothing$	
F	T-slot cutter $a_p < \varnothing$	
G	End mill — side cutting ($\kappa_r = 90°$) Tapered-end mill — side cutting Slab mill $a_p > \varnothing$	
H	End mill — side and centre cutting ($\kappa_r = 90°$) Tapered-end mill — side and centre cutting $a_p > \varnothing$	

Designation symbol	Type of milling cutter	Shape
J	End mill — side cutting and ramping ($\kappa_r = 90°$) Tapered-end mill — side cutting and ramping $a_p > \varnothing$	
K	Ball-nosed end mill $a_p \leqslant 0{,}5\ \varnothing$	
L	Ball-nosed cylindrical end mill — side and centre cutting ($\kappa_r = 90°$) Ball-nosed tapered end mill — side and centre cutting $a_p > 0{,}5\ \varnothing$	
M	Spot facing cutter centre cutting = $a_p = 0{,}5\ \varnothing$ not centre cutting = $a_p < 0{,}5\ \varnothing$	
P	Double half-side and face mill $a_p < \varnothing$	
T	Thread milling cutter	

a Feed.

b See 4.3.

4.3 Designation symbol identifying cutting edge angle, κ_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. κ_r is defined for the various types of milling cutter and end mill in 4.2, 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 κ_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 5).

4.4 Designation symbol identifying shape of insert — Position 4

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

NOTE 1 The included angle is always the smaller angle.
NOTE 2 This table is taken from ISO 1832, except for symbols X and Y.

4.5 Designation symbol identifying diameter, ∅ — Position 5

The definition of the diameter of milling cutters is shown in the drawings in 4.2 (position 2).

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

EXAMPLE 1 Milling cutter or end mill of diameter 32 mm: symbol 032.

EXAMPLE 2 Milling cutter or end mill of diameter 125 mm: symbol 125.

4.6 Designation symbol identifying hand of cutting — Position 6

The symbol for the hand of cutting for a milling cutter is:

Letter symbol	Hand of cutting
L	Left-hand
R	Right-hand
N	Neutral

4.7 Designation symbol identifying 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 (1/10) of a millimetre. The latter possibility only applies if a_p is less than 10 mm.

EXAMPLE 1 Maximum cutting depth or width 105 mm: symbol 105.

EXAMPLE 2 Maximum cutting depth or width 80 mm: symbol 080.

EXAMPLE 3 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".

4.8 Designation symbol identifying orientation of 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 chip-breakers are clamped in milling cutters. The symbols are:

Designation symbol	Tool orthogonal rake γ_o	Tool cutting edge inclination λ_s
A	0° or positive	0° or positive
B	0° or positive	negative
C	negative	0° or positive
D	negative	negative

4.9 Designation symbol identifying 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.

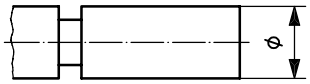
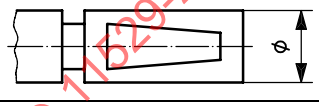
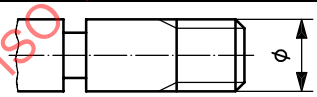
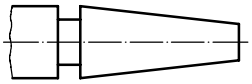
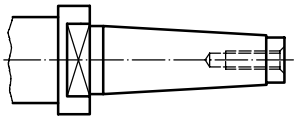
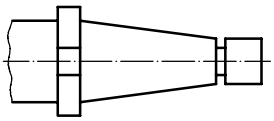
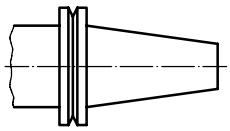
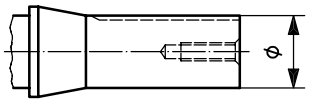
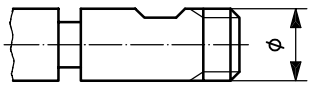
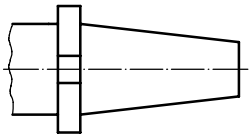
EXAMPLE 1 12 effective cutting edges: symbol 12.

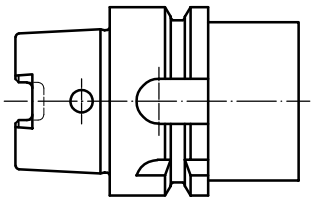
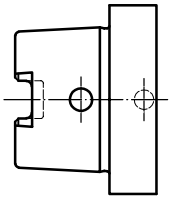
EXAMPLE 2 2 effective cutting edges: symbol 02.

NOTE The number of effective cutting edges is defined as "the number of cutting edges used to calculate the feed per tooth in the direction of feed motion from which κ_f is defined".

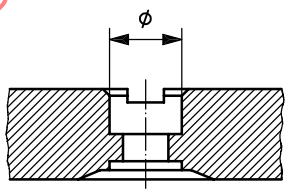
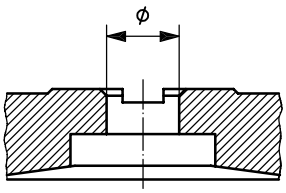
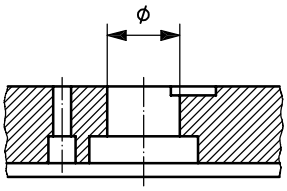
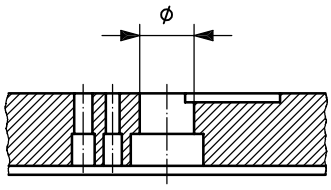
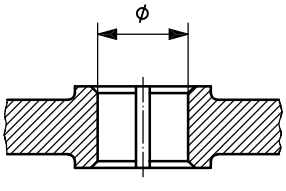
4.10 Designation symbol identifying type of shank or bore — Position 10

4.10.1 Designation symbol identifying type of shank

Designation symbol	Type of shank	Illustration
A	Plain cylindrical shank (ISO 3338-1) NOTE The length may be greater than that specified in ISO 3338-1, i.e. for power chucks.	
B	Flatted cylindrical shank (ISO 3338-2)	
C	Cylindrical shanks with 2° angular flat (whistle notch shank)	
D	Threaded cylindrical shank (ISO 3338-3)	
E	Morse taper shank, type A (ISO 296)	
F	Morse taper shank with positive drive (ISO 5413)	
G	7/24 taper shank (ISO 297)	
H	7/24 taper shank for automatic tool changers (ISO 7388-1)	
J	Combined tapered and threaded shank with short cylinder (Bridgeport R8 type shank)	
K	Flatted cylindrical shank combined with a threaded shank	
L	Flatted cylindrical shank combined with 2° angular flat	
M	Shortened 7/24 taper shank (ISO 297)	

N	Hollow taper shank, type A (ISO 12164-1)	
Q	Hollow taper shank, type C (ISO 12164-1)	
X	Other type of shank	

4.10.2 Designation symbol identifying type of bore

Designation symbol	Type of bore	Illustration
P	Bore type A according to ISO 6462	
S	Bore type B according to ISO 6462 (ISO 2780)	
T	Bore type C according to ISO 6462 (ISO 2940-1)	
U	Bore type C according to ISO 6462 (ISO 2940-1)	
V	Bore with key drive according to ISO 240	
Y	Other type of bore	