INTERNATIONAL STANDARD

ISO 11529-2

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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
ISO 11529-2:1998(E)

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*

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

Annex A of this part of ISO 11529 is for information only.

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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 consultating 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 κ_r (see 3.3)
4	Designation symbol (letter) identifying the shape of insert (see 3.4)
5	Designation symbol (number) identifying the diameter, ∅ (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)

EXEMPLE

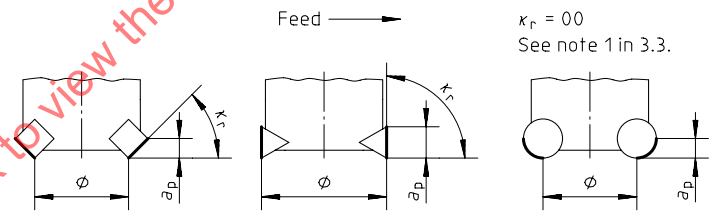
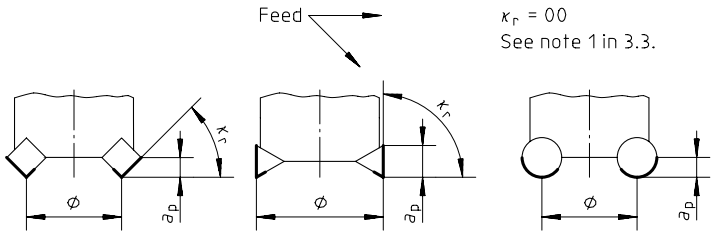
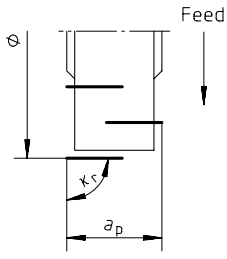
1	2	3	4	5	6	7	8	9	10	11
S	**A**	**75**	**S**	**100**	**R**	**010**	**A**	**08**	**S**	**32**

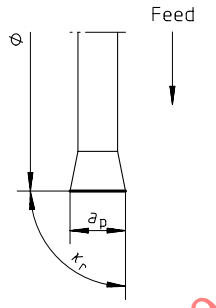
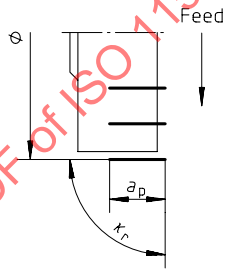
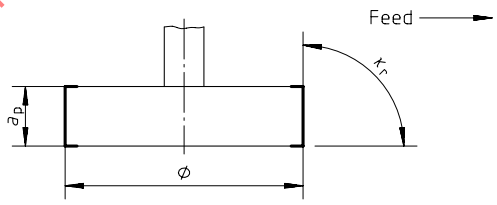
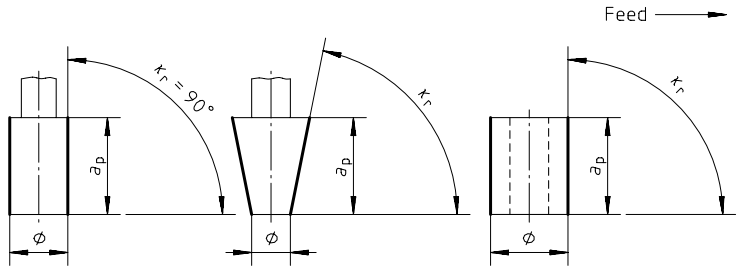
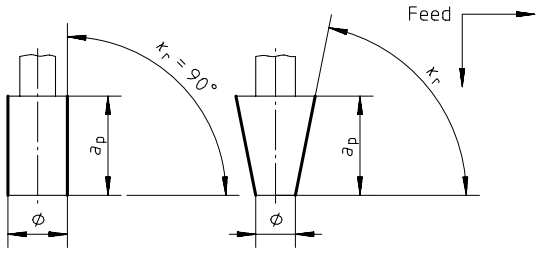
3 Designation symbols

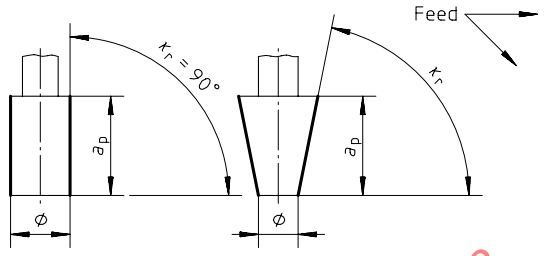
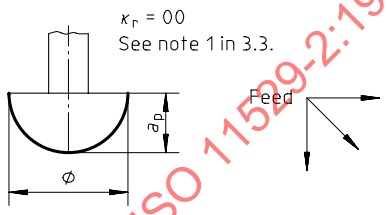
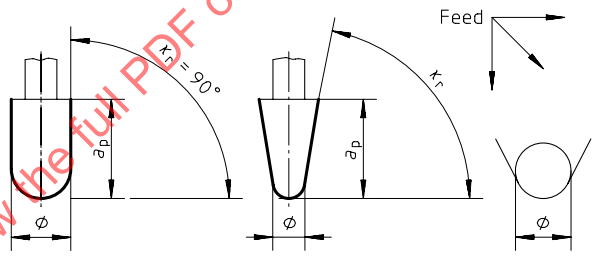
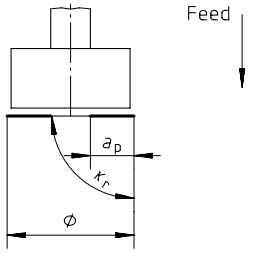
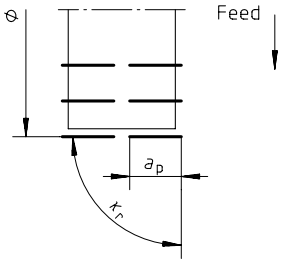
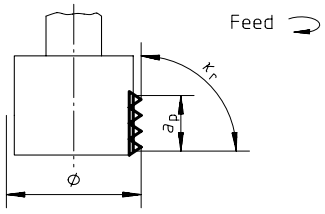
3.1 Designation symbol identifying design of milling cutter — Position 1

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

3.2 Designation symbol identifying type of milling cutter — Position 2

Designations symbol	Type of milling cutter	Shape
A	Face mill Square shoulder face mill $a_p < \varnothing$	
B	Face mill Square shoulder face mill $a_p < \varnothing$	
C	Full side and face mill $a_p < \varnothing$	

Designation symbol	Type of milling cutter	Shape
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 (κ_r = 90°) Tapered end mill- side cutting Slab mill $a_p > \varnothing$	
H	End mill — side and centre cutting (κ_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 (κ_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 (κ_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 Ø not centre cutting = a_p < 0,5 Ø	
P	Double half side and face mill $a_p < \varnothing$	
T	Thread milling cutter	

3.3 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 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 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 4).

3.4 Designation symbol identifying the 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	Hexagonal 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	—

NOTES

1 The included angle is always the smaller angle.

2 This table is extracted from ISO 1832, except for symbols X and Y.

3.5 Designation symbol identifying the diameter, ∅ — 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 γ_o	Tool cutting edge inclination λ_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.

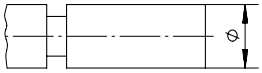
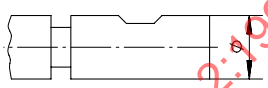
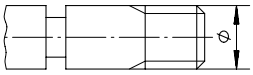
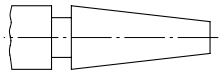
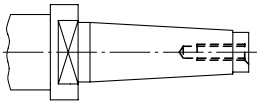
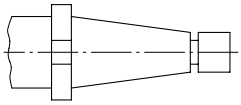
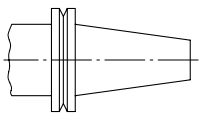
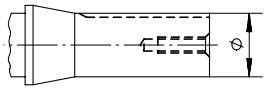
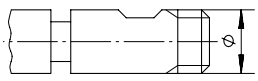
EXAMPLES

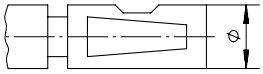
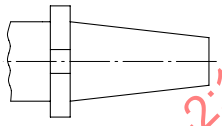
12 effective cutting edges: symbol 12
2 effective cutting edges: symbol 02

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 κ_r is defined.

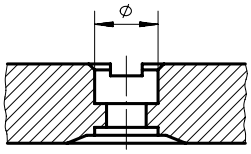
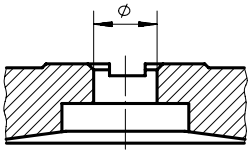
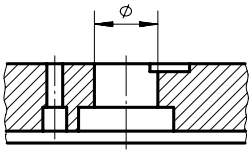
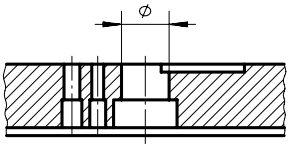
3.10 Designation symbol identifying type of shank or bore — Position 10

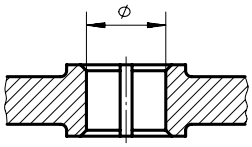
3.10.1 Designation symbol identifying type of shank

Designation symbol	Type of shank	Figure
A	Plain cylindrical shank (ISO 3338-1) NOTE — The length may be greater than 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	

Designation symbol	Type of shank	Figure
L	Flatted cylindrical shank combined with 2° angular flat	
M	Shortened 7/24 taper shank (ISO 297)	
X	Other type of shank	

3.10.2 Designation symbol identifying type of bore

Designation symbol	Type of bore	Figure
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)	

Designation symbol	Type of bore	Figure
V	Bore with key drive according to ISO 240	
Y	Other type of bore	

3.11 Designation symbol identifying size of bore or shank — Position 11

The symbol identifying the size of bore or shank is a two-digit number:

— for cutters with bores; the nominal diameter of the bore in millimeters (for example 32);

— for cylindrical shanks; the nominal diameter in millimeters (for example 25); for shanks smaller than 10 mm, the first digit is a zero (for example 08);

— for Morse taper shanks; the number of the Morse taper, preceded by a zero (for example Morse taper No 3, symbol 03);

— for 7/24 taper shanks; the number of the shank (for example 50).

4 Manufacturer's information

If manufacturers need to give additional information, the designation code should be extended and explanatory details given, e.g., in their catalogues.

The extension is to be separated from the standard code by a hyphen (-).

An example of extending the standard code is shown below:

1	2	3	4	5	6	7	8	9	10	11	Manufacturer's information
S	**A**	**75**	**S**	**100**	**R**	**010**	**A**	**06**	**S**	**32**	**- .....**