INTERNATIONAL STANDARD

ISO 15917

Second edition
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Solid ball-nosed end mills with cylindrical shanks, made of carbide and ceramic materials

Fraises hémisphériques deux tailles monobloc à queue cylindrique, en carbures métalliques et en céramique

Reference number
ISO 15917:2012(E)

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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 15917 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 15917:2007), which has been technically revised.

Solid ball-nosed end mills with cylindrical shanks, made of carbide and ceramic materials

1 Scope

This International Standard specifies types and dimensions of solid ball-nosed end mills with cylindrical shanks made of carbide and ceramic materials according to ISO 513.

NOTE The symbols for dimensions shown in figures in the tables of this International Standard and the corresponding preferred symbols of properties defined in the ISO 13399 series are shown in Table A.1.

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 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

3 Types of solid ball-nosed end mills

Solid ball-nosed end mills are divided into the following two types:

— type 1: solid ball-nosed end mills, short according to Figure 1 and Table 1;

— type 2: solid ball-nosed end mills, long according to Figure 2 and Table 2.

NOTE Both types of ball-nosed end mills can be designed with or without recess. The dimension of the recess is shown as the neck diameter (diameter of recess), d_3, in Figure 1 and Figure 2.

4 Dimensions

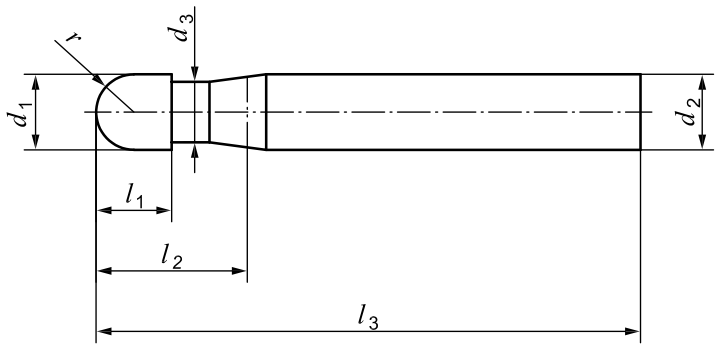

Figure 1 — Type 1 — Ball-nosed end mills, short

Table 1 — Type 1 — Ball-nosed end mills, short

Dimensions in millimetres

Cutting diameter d_1[b]	Radius $r = d_1/2$[b]	Length of cut $l_{1,\min}$	Useable length $l_{2,\min}$[a]	Diameter of recess d_3[d]	Overall length l_3 $^{+2}_{0}$	Shank diameter d_2[c] h6
0,2	(Blank column)	0,2	0,4	(Blank column)	38,0	3,0
0,3		0,3	0,6			
0,4		0,4	0,8			
0,5		0,5	1,0			
0,6		0,6	1,2			
0,8		0,8	1,6			
1,0		1,0	2,0		43,0	4,0
1,2		1,2	2,4			
1,4		1,4	2,8			
1,5		1,5	3,0			
1,6		1,6	3,2			
1,8		1,8	3,6			
2,0		2,0	4,0		57,0	6,0
2,5		2,5	5,0			
3,0		3,0	6,0			
3,5		3,5	7,0			
4,0		4,0	8,0			
4,5		4,5	9,0			
5,0		5,0	10,0			
5,5		5,5	11,0			
6,0		6,0	12,0			
7,0		7,0	14,0		63,0	8,0
8,0		8,0	16,0			
9,0		9,0	18,0		72,0	10,0
10,0		10,0	20,0			
11,0		11,0	22,0		83,0	12,0
12,0		12,0	24,0			
13,0		13,0	26,0			14,0
14,0		14,0	28,0			
16,0		16,0	32,0		92,0	16,0
18,0		18,0	36,0			18,0
20,0		20,0	40,0		104,0	20,0

[a] l_2 is taken as the length extended in parallel to the axis from the top of end mill to the intersection of the cutting diameter, d_1, and a recess taper part.

[b] Tolerance is at the manufacturer's discretion.

[c] Tolerances on d_2 in accordance with ISO 286-2.

[d] Dimension is at the manufacturer's discretion.

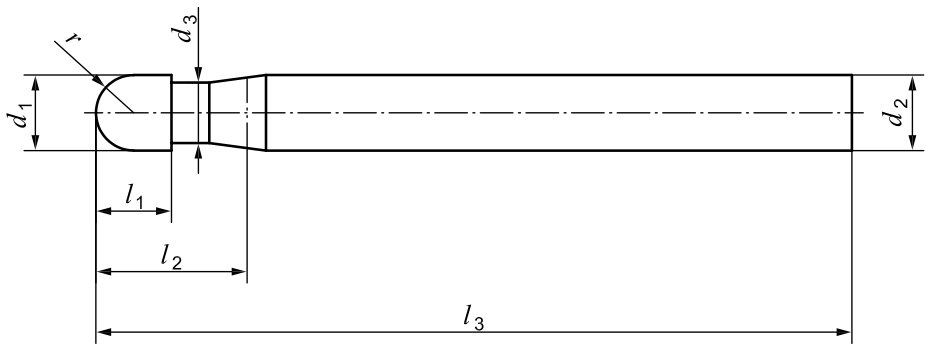

Figure 2 — Type 2 — Ball-nosed end mills, long

Table 2 — Type 2 — Ball-nosed end mills, long

Dimensions in millimetres

Cutting diameter d_1[b]	Radius $r = d_1/2$[b]	Length of cut $l_{1,min}$	Useable length $l_{2,min}$[a]	Diameter of recess d_3[d]	Overall length l_3 $^{+2}_{0}$	Shank diameter d_2[c] h6
0,2	(Blank column)	0,2	0,4	(Blank column)	50,0	3,0
0,3		0,3	0,6			
0,4		0,4	0,8			
0,5		0,5	1,0			
0,6		0,6	1,2			
0,8		0,8	1,6			
1,0		1,0	2,0		60,0	4,0
1,2		1,2	2,4			
1,4		1,4	2,8			
1,5		1,5	3,0			
1,6		1,6	3,2			
1,8		1,8	3,6			
2,0		2,0	4,0		80,0	6,0
2,5		2,5	5,0			
3,0		3,0	6,0			
3,5		3,5	7,0			
4,0		4,0	8,0			
4,5		4,5	9,0			
5,0		5,0	10,0			
5,5		5,5	11,0			
6,0		6,0	12,0			
6,0		6,0	12,0		100,0	8,0
7,0		7,0	14,0			
8,0		8,0	16,0			
8,0		8,0	16,0			10,0
9,0		9,0	18,0			
10,0		10,0	20,0			
10,0		10,0	20,0		120,0	12,0
11,0		11,0	22,0			
12,0		12,0	24,0			
13,0		13,0	26,0			14,0
14,0		14,0	28,0			
13,0		13,0	26,0		140,0	16,0
14,0		14,0	28,0			
16,0		16,0	32,0			

Table 2 *(continued)*

Cutting diameter d_1[b]	Radius $r = d_1/2$[b]	Length of cut $l_{1,min}$	Useable length $l_{2,min}$[a]	Diameter of recess d_3[d]	Overall length l_3 $^{+2}_{0}$	Shank diameter d_2[c] h6
18,0	(Blank column)	18,0	36,0	(Blank column)	160,0	18,0
18,0		18,0	36,0			20,0
20,0		20,0	40,0			

[a] l_2 is taken as the length extended in parallel to the axis from the top of end mill to the intersection of the cutting diameter, d_1, and a recess taper part.

[b] Tolerance is at the manufacturer's discretion.

[c] Tolerances on d_2 in accordance with ISO 286-2.

[d] Dimension is at the manufacturer's discretion.

Annex A
(informative)

Relationship between designations in this International Standard and the ISO 13399 series

For the relationship between designations in this International Standard and preferred symbols according to the ISO 13399 series, see Table A.1.

Table A.1 — Relationship between designations in this International Standard and the ISO 13399 series

Symbol in this International Standard (ISO 15917)	Reference in this International Standard (ISO 15917)	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
d_1	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Cutting diameter	DC	71D084653E57F ISO/TS 13399-3
d_2	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Shank diameter	DMM	71CF29862B277 ISO/TS 13399-3
d_3	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Neck diameter	DN	71EAC48EC5DE0 ISO/TS 13399-3
$r = d_1/2$	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Profile radius	PRFRAD	71E019EBAE1B1 ISO/TS 13399-2
$l_{1,\min}$	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Depth of cut maximum	APMX	71D07576C0558 ISO/TS 13399-3
$l_{2,\min}$	Clause 4, Figure 1, Table 1 Clause 5, Table 9 Clause 4, Figure 2, Table 2	Usable length maximum	LUX	71CF2992BDBCC ISO/TS 13399-3

Bibliography

[1] ISO 513, *Classification and application of hard cutting materials for metal removal with defined cutting edges — Designation of the main groups and groups of application*

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