INTERNATIONAL STANDARD

ISO 22037

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Solid end mills with corner radii and cylindrical shanks made of hard cutting materials — Dimensions

Fraises toriques deux tailles monobloc, à queue cylindrique, en matériaux durs de coupe — Dimensions

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Foreword

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ISO 22037 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 9, *Tools with cutting edges made of hard cutting materials*.

Solid end mills with corner radii and cylindrical shanks made of hard cutting materials — Dimensions

1 Scope

This International Standard specifies types and dimensions of solid end mills, with corner radii and cylindrical shanks, made of hard cutting materials in accordance with ISO 513.

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, *ISO system of limits and fits — Part 2: Tables of standard tolerance grades and limit deviations for holes and shafts*

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*

3 Types of radiused end mills

The end mills with corner radii are divided into two types:

— Type 1: End mills with corner radii, short according to Figure 1 and Table 1;

— Type 2: End mills with corner radii, long according to Figure 2 and Table 2.

NOTE Both types of end mills with corner radii can be designed with or without a recess. The dimension of the neck recess (diameter of recess) d_3 is shown in Figures 1 and 2.

4 Dimensions

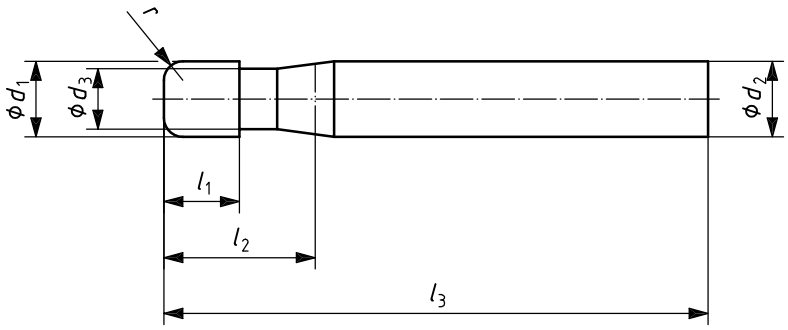

Figure 1 — Type 1: End mills with corner radii, short

Table 1 — Type 1: End mills with corner radii, short

Dimensions in millimetres

Cutting diameter d_1	Radius r [d]	Length of cut l_1 Minimum	Usable length l_2 [a] Minimum	Diameter of recess d_3 [b]	Overall length l_3 $^{+2}_{0}$	Shank diameter d_2 [c] h6
0,5	Blank column	0,5	1,0	Blank column	38,0	3,0
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 the end mill to the intersection of cutting diameter d_1 with a recess taper part.

[b] Dimension is at the manufacturer's option.

[c] Tolerances on d_2 according to ISO 286-2.

[d] See Table 3.

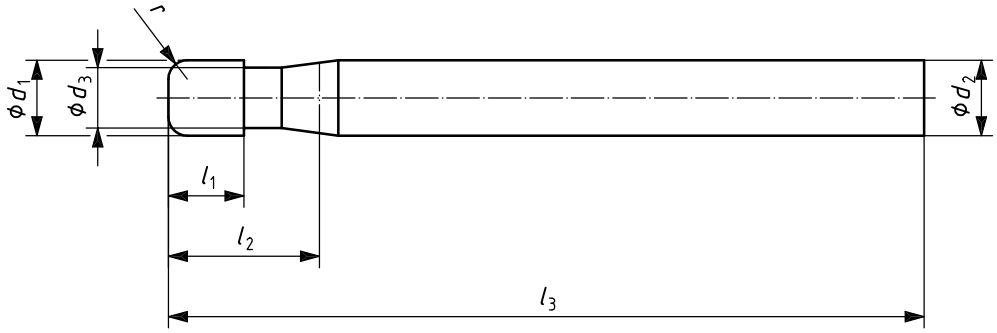

Figure 2 — Type 2: End mills with corner radii, long

Table 2 — Type 2: End mills with corner radii, long

Dimensions in millimetres

Cutting diameter d_1	Radius r [d]	Length of cut l_1 Minimum	Usable length l_2 [a] Minimum	Diameter of recess d_3 [b]	Overall length l_3 $^{+2}_{0}$	Shank diameter d_2 [c] h6
0,5	Blank column	0,5	1,0	Blank column	50,0	3,0
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			
18,0		18,0	36,0		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 the end mill to the intersection of cutting diameter d_1 with a recess taper part.

[b] Dimension is at the manufacturer's option.

[c] Tolerances on d_2 according to ISO 286-2.

[d] See Table 3.

Table 3 — Radii for end mills, short and long

Dimensions in millimetres

Diameter	Radius r ± 0,010										
	0,1	0,2	0,3	0,5	1	1,5	2	3	4	5	6
0,5	+										
0,6	+	+									
0,8	+	+									
1,0	+	+	+								
1,2	+	+	+								
1,4	+	+	+	+							
1,5	+	+	+	+							
1,6	+	+	+	+							
1,8	+	+	+	+							
2,0	+	+	+	+							
2,5		+	+	+							
3,0		+	+	+	+						
3,5		+	+	+	+						
4,0		+	+	+	+						
4,5			+	+	+						
5,0			+	+	+						
5,5			+	+	+	+					
6,0			+	+	+	+					
7,0				+	+	+	+				
8,0				+	+	+	+				
9,0				+	+	+	+				
10,0				+	+	+	+				
11,0					+	+	+	+			
12,0					+	+	+	+	+		
13,0					+	+	+	+	+		
14,0					+	+	+	+	+		
16,0					+	+	+	+	+	+	+
18,0					+	+	+	+	+	+	+
20,0					+	+	+	+	+	+	+

Key

+	first preference: radius covered by this International Standard
	non-shaded square, second preference: radius not covered by this International Standard
	shaded squares: radius not recommended

ICS 25.100.10

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