
**Machine chucking reamers with
cylindrical shanks and Morse taper
shanks**

Alésoirs à machine, à queue cylindrique et à queue cône Morse

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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 521 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 2, *High speed steel cutting tools and their attachments*.

This second edition cancels and replaces the first edition (ISO 521:1975), of which it constitutes a minor revision. In particular, the normative references have been updated.

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Machine chucking reamers with cylindrical shanks and Morse taper shanks

1 Scope

This International Standard specifies the dimensions of machine chucking reamers with cylindrical shanks and Morse taper shanks.

It deals with the following types of reamer:

- machine chucking reamers with cylindrical shanks in the range from 1,32 mm to 20 mm diameter;
- machine chucking reamers with Morse taper shanks in the range from 5,30 mm to 50 mm diameter.

For each type of reamer, this International Standard gives two tables, one showing preferred sizes with corresponding dimensions, and the other being a general table set out as functions of diameter steps. Provision is also made for tolerances on lengths, cutting diameters and the diameters of cylindrical shanks.

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 237, *Rotating tools with parallel shanks — Diameters of shanks and sizes of driving squares*

ISO 296, *Machine tools — Self-holding tapers for tool shanks*

3 Dimensions

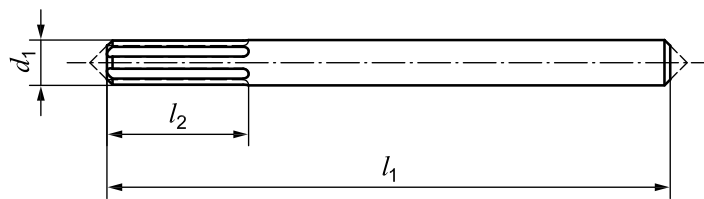
3.1 General

All dimensions and tolerances are given in millimetres.

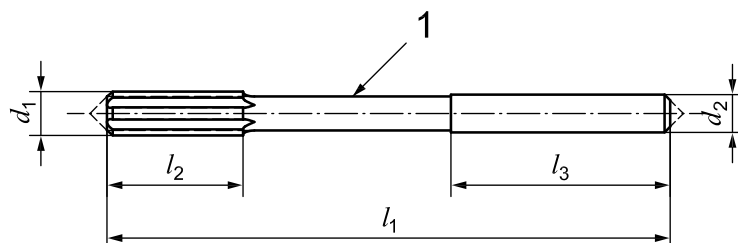
Unless otherwise stated, these reamers are right-hand cutting. The flutes may be straight or spiral, at the discretion of the manufacturer.

3.2 Dimensions of reamers with cylindrical shanks

The dimensions of reamers with cylindrical shanks shall be in accordance with the indications given in Figure 1 and Tables 1 and 2.



a) For d_1 up to 3,75 mm



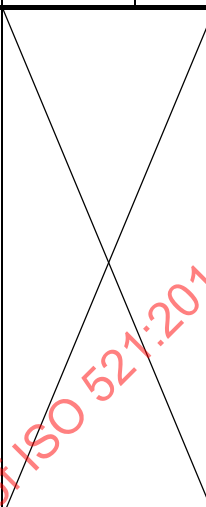
Key

1 cylindrical shank in accordance with ISO 237

b) For d_1 over 3,75 mm

Figure 1 — Reamers with cylindrical shanks

Table 1 — Preferred dimensions of reamers with cylindrical shanks

d_1^a	d_2	l_1	tol. ^c	l_2	tol. ^c	l_3	tol. ^c
m6	h9						
1,4	1,4	40	± 1,5	8	± 1		
(1,5) ^b	1,5						
1,6	1,6	43		9			
1,8	1,8	46		10			
2,0	2,0	49		11			
2,2	2,2	53		12			
2,5	2,5	57		14			
2,8	2,8	61		15			
3,0	3,0			16			
3,2	3,2	65		18			
3,5	3,5	70		19		32	± 1,5
4,0	4,0	75		21		33	
4,5	4,5	80		23		34	
5,0	5,0	86		26		36	
5,5	5,6	93		26			
6	5,6	93		31	40		
7	7,1	109		33	42		
8	8,0	117		36	44		
9	9,0	125	± 2	38	46		
10	10,0	133		41			
11		142		44			
12		151		47	50		
(13) ^b				50			
14	12,5	160		52	52		
(15) ^b		162		54			
16		170		56	58		
(17) ^b	14,0	175		58			
18		182		60			
(19) ^b	16,0	189					
20		195					

^a The cutting diameter is measured immediately behind the taper lead or chamfer.

^b The use of the sizes in parentheses shall be avoided wherever possible.

^c For special tolerances, the lengths of reamers and their shank dimensions may be chosen from the next larger or smaller range, but the above-mentioned tolerances apply.

Table 2 — General table, set out as functions of diameter steps

Diameter range		d_2 h9	l_1		l_2		l_3	
d_1 m6				tol.		tol.		tol.
From	Up to and including							
1,32	1,50	$d_1 = d_2$	40	$\pm 1,5$	8	± 1		
1,50	1,70		43		9			
1,70	1,90		46		10			
1,90	2,12		49		11			
2,12	2,36		53		12			
2,36	2,65		57		14			
2,65	3,00		61		15			
3,00	3,35		65		16			
3,35	3,75		70		18			
3,75	4,25	4,0	75	$\pm 1,5$	19	$\pm 1,5$	32	$\pm 1,5$
4,25	4,75	4,5	80		21		33	
4,75	5,30	5,0	86		23		34	
5,30	6,00	5,6	93		26		36	
6,00	6,70	6,3	101		28		38	
6,70	7,50	7,1	109		31	$\pm 1,5$	40	
7,50	8,50	8,0	117		33		42	
8,50	9,50	9,0	125		36		44	
9,50	10,60	10,0	133		38		46	
10,60	11,80		142	41				
11,80	13,20		151	44				
13,20	14,00	12,5	160	47	$\pm 1,5$	50		
14,00	15,00		162	50				
15,00	16,00		170	52				
16,00	17,00	14,0	175	54		52		
17,00	18,00		182	56				
18,00	19,00		189	58				
19,00	20,00	16,0	195	60		58		

3.2.1 Dimensions of cylindrical shanks of reamers in range from 1,32 mm to 3,75 mm diameter

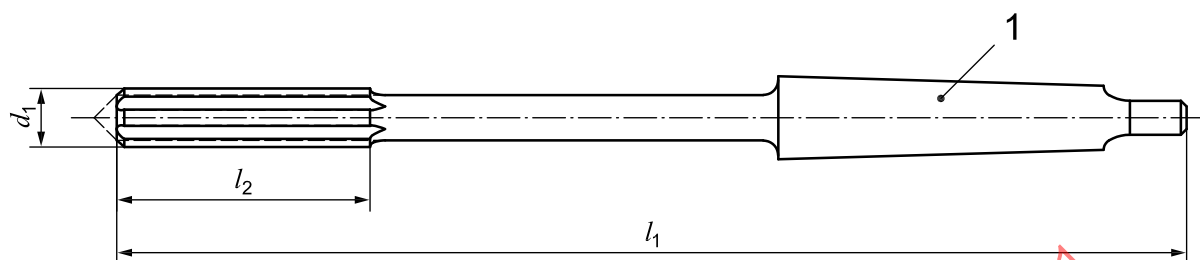
The diameters of the cylindrical shank shall be the same diameters as the cutting part.

3.2.2 Dimensions of cylindrical shanks of reamers in the range from 3,75 mm to 20 mm diameter

The diameters of the cylindrical shanks shall be in accordance with ISO 237.

3.3 Dimensions of reamers with Morse taper shanks

The dimensions of reamers with Morse taper shanks shall be in accordance with the indications given in Figure 2 and Tables 3 and 4.



Key

1 Morse taper shank in accordance with ISO 296

Figure 2 — Reamers with Morse taper shanks

Table 3 — Preferred dimensions of reamers with Morse taper shanks

d_1^a m6	l_1		l_2		Morse taper No.	d_1^a m6	l_1		l_2		Morse taper No.		
		tol. ^c		tol. ^c				tol. ^c		tol. ^c			
5,5	138	± 2	26	± 1	1	(24) ^b	268	± 2	68	$\pm 1,5$	3		
6				25		(26) ^b						273	70
7				28		277						71	
8	150			31		(30) ^b	281	73					
9	156			33		32	317	77					
10	162			36		(34) ^b	321	78					
11	168			38		(35) ^b			79				
12	175			41		36	325	81					
(13) ^b	182			44		(38) ^b	329	82					
14				47		40		333	83				
15	204			50		(42) ^b	336	84					
16	210			52		(44) ^b			86				
(17) ^b	214			54	45	(46) ^b	344						
18	219			56	(48) ^b								
(19) ^b	223			58									
20	228			60									
22	237			64									

^a The cutting diameter is measured immediately behind the taper lead or chamfer.

^b The use of the sizes in parentheses shall be avoided wherever possible.

^c For special tolerances, the lengths of reamers and their shank dimensions may be chosen from the next larger or smaller range, but the above-mentioned tolerances apply.