
**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 521:2011

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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

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.

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

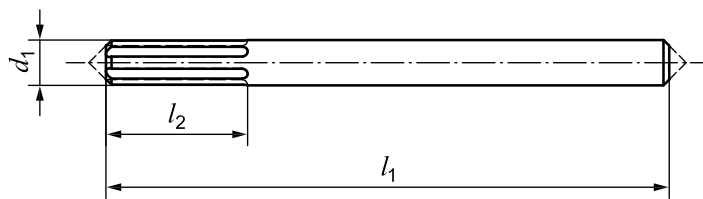
3.1 General

All dimensions and tolerances are given in millimetres.

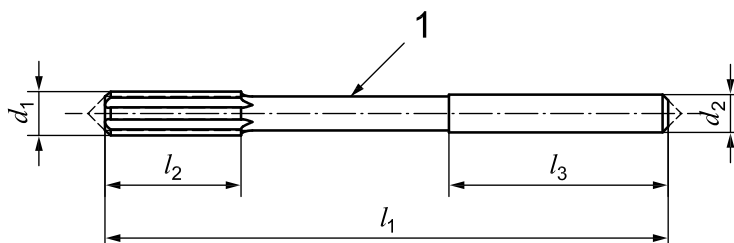
Unless otherwise stated, these reamers are right-hand cutting. The flutes may be straight or spiral, at the discretion of the manufacturer.

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

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Table 1 — Preferred dimensions of reamers with cylindrical shanks

d_1^a	d_2	l_1		l_2		l_3	
m6	h9		tol. ^c		tol. ^c		tol. ^c
1,4	1,4	40	± 1,5	± 1	± 1,5	X	
(1,5) ^b	1,5						
1,6	1,6	43					
1,8	1,8	46					
2,0	2,0	49					
2,2	2,2	53					
2,5	2,5	57					
2,8	2,8	61					
3,0	3,0						
3,2	3,2	65					
3,5	3,5	70					
4,0	4,0	75					
4,5	4,5	80					
5,0	5,0	86					
5,5	5,6	93					
6	5,6	93					
7	7,1	109					
8	8,0	117					
9	9,0	125					
10	10,0	133					
11		142					
12		151					
(13) ^b	12,5	160					
14			162				
(15) ^b			170				
16	14,0	175					
(17) ^b			182				
18			189				
(19) ^b	16,0	195					
20			60				

^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		
From	Up to and including			tol.		tol.		tol.	
1,32	1,50	$d_1 = d_2$	40	$\pm 1,5$	8	± 1	X		
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		
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		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		$\pm 1,5$
10,60	11,80		142		41				
11,80	13,20		151	44					
13,20	14,00	12,5	160	47	50	$\pm 1,5$			
14,00	15,00		162	50					
15,00	16,00		170	52					
16,00	17,00	14,0	175	54	52	$\pm 1,5$			
17,00	18,00		182	56					
18,00	19,00	16,0	189	58	58	$\pm 1,5$			
19,00	20,00		195	60					

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

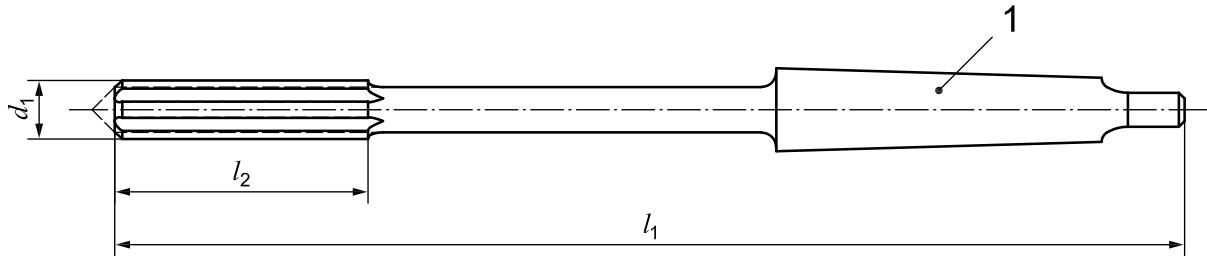
The diameters of the cylindrical shank shall be the same diameters as the cutting part.

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 tol. ^c	l_2 tol. ^c	Morse taper No.	d_1^a m6	l_1 tol. ^c	l_2 tol. ^c	Morse taper No.
5,5	138	26	± 1	(24) ^b	268	68	3
6				25			
7	150	31	± 2	(26) ^b	273	70	
8	156	33		277	71		
9	162	36	(30) ^b	281	73		
10	168	38	32	317	77		
11	175	41	(34) ^b	321	78		
12	182	44	(35) ^b				
(13) ^b			± 2	± 1,5	36	325	
14	189	47	(38) ^b		329	81	
15	204	50	40	333	82		
16	210	52	(42) ^b				
(17) ^b	214	54	(44) ^b	336	83		
18	219	56	45	340	84		
(19) ^b	223	58	(46) ^b				
20	228	60	(48) ^b	344	86		
22	237	64	50				

^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.