

**BS ISO 521:2011**



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

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**National foreword**

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## **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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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.



# 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

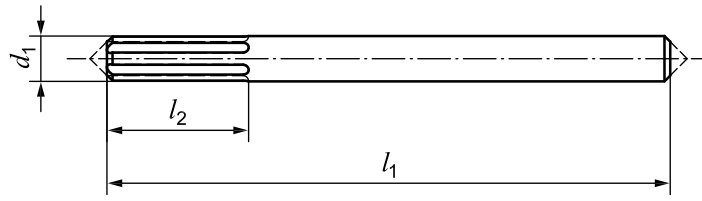
### 3.1 General

All dimensions and tolerances are given in millimetres.

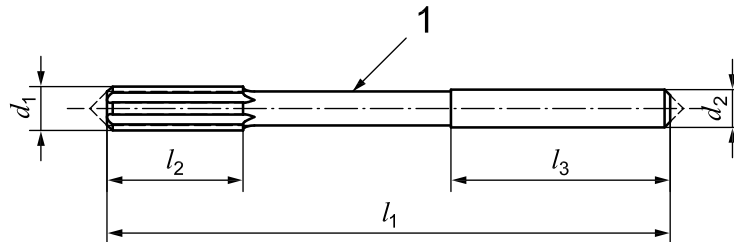
Unless otherwise stated, these reamers are right-hand cutting. The flutes may be straight or spiral, at the discretion of the manufacturer.

### 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**

$d_1^a$	$d_2$	$l_1$		$l_2$		$l_3$		
m6	h9		tol. <sup>c</sup>		tol. <sup>c</sup>		tol. <sup>c</sup>	
1,4	1,4	40	± 1,5	8	± 1	X		
(1,5) <sup>b</sup>	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							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	38	46				
10	10,0	133	41					
11		142	44					
12		151	47					
(13) <sup>b</sup>	12,5	160	50	50				
14		162	52					
(15) <sup>b</sup>		170	54					
(17) <sup>b</sup>	14,0	175	56	52				
18		182	58					
(19) <sup>b</sup>	16,0	189	60	58				
20		195						

<sup>a</sup> The cutting diameter is measured immediately behind the taper lead or chamfer.

<sup>b</sup> The use of the sizes in parentheses shall be avoided wherever possible.

<sup>c</sup> 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	$\pm 1$	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		19		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	$\pm 2$	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	16,0	189		58		58	
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**

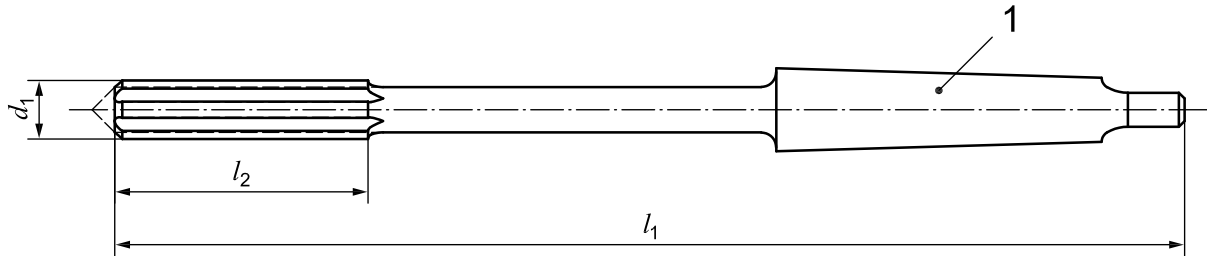
The diameters of the cylindrical shank shall be the same diameters as the cutting part.

**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. <sup>c</sup>	$l_2$ tol. <sup>c</sup>	Morse taper No.	$d_1^a$ m6	$l_1$ tol. <sup>c</sup>	$l_2$ tol. <sup>c</sup>	Morse taper No.
5,5	138	26	± 1	(24) <sup>b</sup>	268	68	3
6				25			
7	150	31	± 2	(26) <sup>b</sup>	273	70	3
8	156	33		28	277	71	
9	162	36	± 2	(30) <sup>b</sup>	281	73	3
10	168	38		32	317	77	
11	175	41	± 1,5	(34) <sup>b</sup>	321	78	4
12	182	44		(35) <sup>b</sup>		79	
(13) <sup>b</sup>		± 2	± 1,5	(38) <sup>b</sup>	325	81	± 1,5
14	189	47		40	329	81	
15	204	50	± 3	(42) <sup>b</sup>	333	82	4
16	210	52		(44) <sup>b</sup>	336	83	
(17) <sup>b</sup>	214	54	± 3	45	336	83	4
18	219	56		(46) <sup>b</sup>	340	84	
(19) <sup>b</sup>	223	58	± 3	(48) <sup>b</sup>	344	86	4
20	228	60		50		86	
22	237	64					

<sup>a</sup> The cutting diameter is measured immediately behind the taper lead or chamfer.

<sup>b</sup> The use of the sizes in parentheses shall be avoided wherever possible.

<sup>c</sup> 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 4 — General table, set out as functions of diameter steps

Diameter range $d_1$ m6		$l_1$		$l_2$		Morse taper No.
From	Up to and including		tol.		tol.	
5,30	6,00	138	± 2	26	± 1	1
6,00	6,70	144		28		
6,70	7,50	150		31		
7,50	8,50	156		33		
8,50	9,50	162		36		
9,50	10,60	168		38		
10,60	11,80	175		41		
11,80	13,20	182		44		
13,20	14,00	189		47		
14,00	15,00	204		50	± 1,5	
15,00	16,00	210	52			
16,00	17,00	214	54			
17,00	18,00	219	56			
18,00	19,00	223	58			
19,00	20,00	228	60			
20,00	21,20	232	62			
21,20	22,40	237	64			
22,40	23,02	241	66			
23,02	23,60	264	66	± 1,5		3
23,60	25,00	268	68			
25,00	26,50	273	70			
26,50	28,00	277	71			
28,00	30,00	281	73			
30,00	31,50	285	75			
31,50	31,75	290	77			
31,75	33,50	317	77			
33,50	35,50	321	78			
35,50	37,50	325	79			
37,50	40,00	329	81	± 3	4	
40,00	42,50	333	82			
42,50	45,00	336	83			
45,00	47,50	340	84			
47,50	50,00	344	86			







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