
INTERNATIONAL STANDARD



521

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Machine chucking reamers with parallel shanks or Morse taper shanks

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

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Descriptors : tools, power-operated tools, reamers, Morse taper shanks, parallel shanks, dimensions, diameters, dimensional tolerances.

FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 521 was drawn up by Technical Committee ISO/TC 29, *Small tools*, and circulated to the Member Bodies in July 1974.

It has been approved by the Member Bodies of the following countries :

Austria	Italy	Switzerland
Belgium	Japan	Turkey
Canada	Mexico	United Kingdom
Czechoslovakia	Norway	U.S.A.
France	Poland	U.S.S.R.
Hungary	Romania	Yugoslavia
India	South Africa, Rep. of	
Israel	Sweden	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Germany

This International Standard cancels and replaces ISO Recommendation R 521-1966, of which it constitutes a technical revision.

Machine chucking reamers with parallel shanks or Morse taper shanks

1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down the dimensions of machine chucking reamers with parallel shanks or Morse taper shanks.

It deals with the following types of reamer :

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

It covers only metric dimensions, which are the only recommended dimensions in the future.

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

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

This International Standard is supplementary to ISO 236/I and ISO 236/II.

2 REFERENCES

ISO 236/I, *Hand reamers*.¹⁾

ISO 236/II, *Long fluted machine reamers – Morse taper shanks*.¹⁾

ISO 237, *Rotating tools with parallel shanks – Diameters of shanks and sizes of driving squares*.

ISO/R 286, *ISO System of limits and fits – Part 1: General, tolerances and deviations*.

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

3 SHANKS

3.1 Reamers with parallel shanks, in the range over 1,32 to 3,75 mm diameter

These shanks shall have the same diameters as the cutting portion.

3.2 Reamers with parallel shanks, in the range over 3,75 to 20 mm diameter

These shanks shall be in accordance with ISO 237, as shown in tables 2 and 3.

3.3 Reamers with Morse taper shanks

These shanks shall be in accordance with ISO 296.

4 TOLERANCES

4.1 Cutting portion

Tolerance on diameter d , measured immediately behind the taper lead or chamfer : m6* (for reamers supplied from stock).

4.2 Parallel shanks

Tolerance on diameter d_1 : h9*

4.3 Lengths

Tolerance on lengths for all types of machine chucking reamer shall be as given in table 1.

TABLE 1 – Tolerances on lengths

Values in millimetres

Total overall length L , Cutting edge length / Parallel shank length / l_1		Tolerances
over	up to and including	
6	30	+ 1
30	120	± 1,5
120	315	± 2
315	1 000	± 3

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

Example :

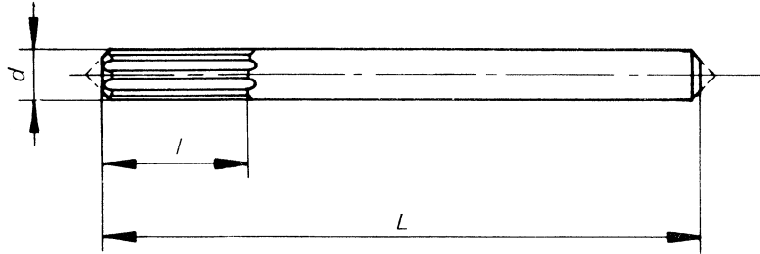
For a reamer with Morse taper shank of diameter 14 mm, length L may be 204 mm, length l_1 50 mm and Morse taper No. 2, or length L may be 182 mm, length l_1 44 mm and Morse taper No. 1 (see table 5).

1) At present at the stage of draft. (Revision of ISO/R 236.)

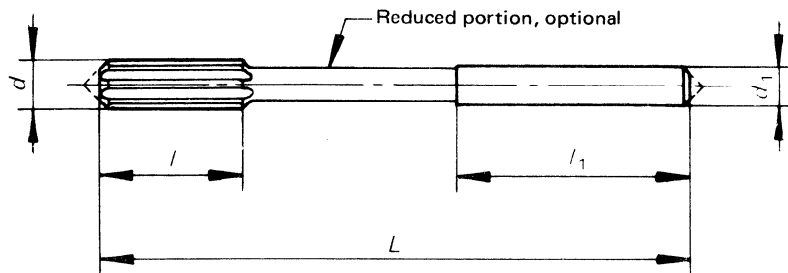
* See ISO/R 286.

5 MACHINE CHUCKING REAMERS WITH PARALLEL SHANKS

For d up to 3,75 mm



For d over 3,75 mm



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TABLE 2 – Preferred sizes

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Dimensions in millimetres

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

The use of those sizes shown in brackets should be avoided wherever possible.

TABLE 3 – General table, set out as functions of diameter steps

Dimensions in millimetres

Diameter range <i>d</i>		<i>d</i> ₁	<i>L</i>	<i>l</i>	<i>l</i> ₁
over	up to and including				
1,32	1,50	<i>d</i> ₁ = <i>d</i>	40	8	
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	75	19	32	
4,25	4,75	80	21	33	
4,75	5,30	86	23	34	
5,30	6,00	93	26	36	
6,00	6,70	101	28	38	
6,70	7,50	109	31	40	
7,50	8,50	117	33	42	
8,50	9,50	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	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	

6 MACHINE CHUCKING REAMERS WITH MORSE TAPER SHANKS

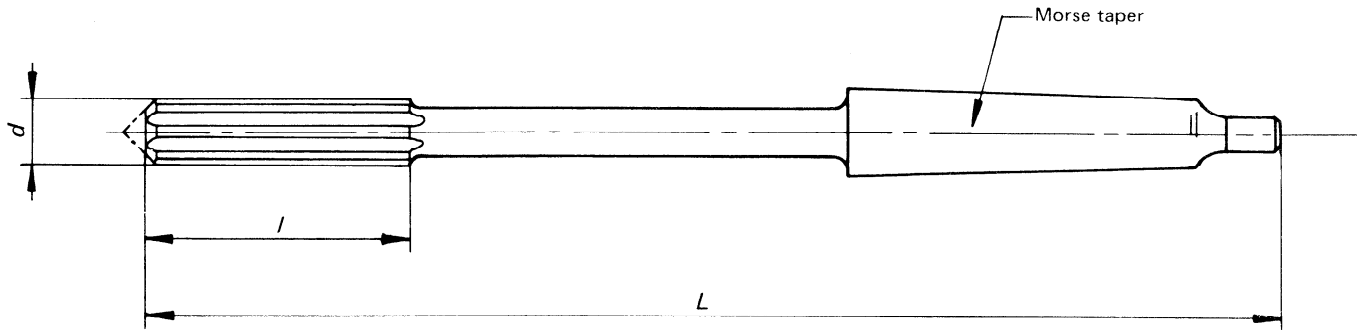


TABLE 4 — Preferred sizes

Dimensions in millimetres

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

The use of those sizes shown in brackets should be avoided wherever possible.

TABLE 5 – General table, set out as functions of diameter steps

Dimensions in millimetres

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

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