
INTERNATIONAL STANDARD



494

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

Parallel shank twist drills — Long series

Forets à queue cylindrique — Série longue

First edition — 1975-02-01

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[ISO 494:1975](#)

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UDC 621.951.45

Ref. No. ISO 494-1975 (E)

Descriptors : tools, twist drills, shanks, parallel shanks, dimensions.

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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 29 has reviewed ISO Recommendation R 494 and found it technically suitable for transformation. International Standard ISO 494 therefore replaces ISO Recommendation R 494-1966 to which it is technically identical.

<https://standards.iteh.ai/catalog/standards/sist/c79dcfcf-e7a7-4bee-86a8-321508569d16/iso-194-1975>

ISO Recommendation R 494 was approved by the Member Bodies of the following countries :

Austria	Germany	Portugal
Belgium	Hungary	Spain
Brazil	India	Sweden
Canada	Italy	Switzerland
Chile	Japan	Turkey
Colombia	Korea, Rep. of	United Kingdom
Czechoslovakia	Netherlands	U.S.S.R.
Denmark	New Zealand	Yugoslavia
France	Poland	

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

U.S.A.

The Member Body of the following country disapproved the transformation of ISO/R 494 into an International Standard :

Austria

Parallel shank twist drills – Long series

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1 SCOPE AND FIELD OF APPLICATION

This International Standard lays down the dimensions of parallel shank twist drills, long series.

It supplements ISO 235/1, *Parallel shank twist drills, jobber and stub series, Morse taper shank twist drills and core drills*.

It comprises three tables giving respectively :

- a) the recommended dimensions in millimetres;
- b) the recommended dimensions in inches;
- c) the corresponding lengths, in millimetres and in inches, set out as functions of diameter steps.

2 INTERCHANGEABILITY

The numerical tables have been drawn up in such a way as

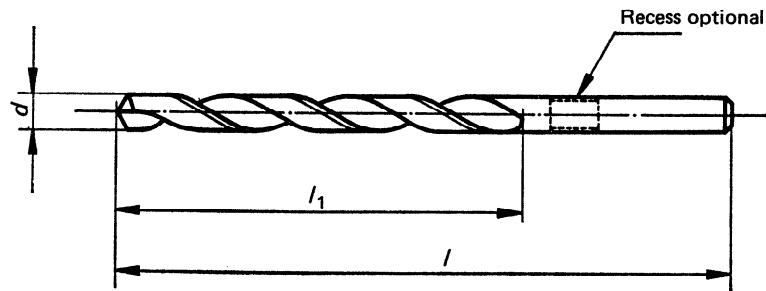
to ensure that the standard dimensions in millimetres and inches correspond as closely as possible.

To this end, the complete range of diameters has been subdivided into a number of steps, the limits of which have been derived from the preferred number series for the metric values and converted directly from those for the inch values; the lengths remain the same for the metric and for the inch values, within a given step.

The recommended diameters in the two systems of units of measurement differ, however, and the number of recommended diameters, in a given step, also differs in one system from that in the other.

Finally, the tolerance on the diameter of the cutting portion has been standardized solely on the basis of the metric values of h8, converted directly into inches for inch drills.

3 DIMENSIONS



3.1 Recommended dimensions in millimetres

d	l_1	l	d	l_1	l	d	l_1	l	d	l_1	l
1,00	33	56	3,60	73	112	6,20	97	148	8,80	115	175
1,10	37	60	3,70			6,30			8,90		
1,20	41	65	3,80	6,40	9,00						
1,30			3,90	6,50	9,10						
1,40	45	70	4,00	78	119	6,60			9,20		
1,50			4,10	6,70	9,30						
1,60	50	76	4,20	6,80	9,40						
1,70			4,30	6,90	9,50						
1,80	53	80	4,40	7,00	9,60						
1,90			4,50	82	126	7,10			9,70		
2,00	56	85	4,60	102	156	7,20	9,80				
2,10			4,70	7,30	9,90						
2,20	59	90	4,80	7,40	10,00						
2,30			4,90	7,50	10,10	121	184				
2,40	62	95	5,00	87	132	7,60	10,20				
2,50			5,10			7,70	10,30				
2,60	66	100	5,20	7,80	10,40						
2,70			5,30	7,90	10,50						
2,80	69	106	5,40	91	139	8,00	10,60				
2,90			5,50			8,10	10,70				
3,00	73	112	5,60	97	148	8,20	10,80				
3,10			5,70			8,30	10,90				
3,20	69	106	5,80	91	139	8,40	11,00	128	195		
3,30			5,90			8,50	11,10				
3,40	73	112	6,00	97	148	8,60	115	175	11,20		
3,50			6,10			97	148	8,70	11,30		

Recommended dimensions in millimetres (concluded)

<i>d</i>	<i>l</i> ₁	<i>l</i>	<i>d</i>	<i>l</i> ₁	<i>l</i>	<i>d</i>	<i>l</i> ₁	<i>l</i>	<i>d</i>	<i>l</i> ₁	<i>l</i>
11,40	128	195	13,90	140	214	20,00	166	254	26,25	190	290
11,50			14,00			20,25	26,50				
11,60			14,25	171	261	26,75	195	298			
11,70			14,50			27,00					
11,80			14,75			27,25					
11,90	15,00	27,50									
12,00	15,25	176	268	27,75	201	307					
12,10	15,50			28,00							
12,20	15,75			28,25							
12,30	16,00			28,50							
12,40	16,25	180	275	28,75	207	316					
12,50	16,50			29,00							
12,60	16,75			29,25							
12,70	17,00			29,50							
12,80	17,25			29,75							
12,90	17,50	185	282	30,00	207	316					
13,00	17,75			30,25							
13,10	18,00			30,50							
13,20	18,25			30,75							
13,30	18,50	24,75	31,00								
13,40	18,75	162	247	31,25	190	290					
13,50	19,00			25,00							
13,60	19,25	166	254	31,50							
13,70	19,50			25,25							
13,80	19,75			25,50							
				25,75							
				26,00							

3.2 Recommended dimensions in inches

<i>d</i>	<i>l</i> ₁	<i>l</i>	<i>d</i>	<i>l</i> ₁	<i>l</i>	<i>d</i>	<i>l</i> ₁	<i>l</i>
3/64	1 5/8	2 ⁰ /16	15/32	5 9/32	8 1/16	57/64	7 3/32	10 ¹³ /16
1/16	1 ³¹ /32	3	31/64					
5/64	2 7/32	3 ¹¹ /32	1/2					
3/32	2 7/16	3 3/4	33/64	5 1/2	8 7/16	15/16	7 9/32	11 3/32
7/64	2 ¹⁹ /32	3 ¹⁵ /16	17/32					
1/8	2 ²³ /32	4 3/16	35/64					
9/64	2 7/8	4 ¹³ /32	9/16	5 ¹¹ /16	8 ²¹ /32	63/64	7 ¹⁵ /32	11 ¹³ /32
5/32	3 1/16	4 ¹¹ /16	37/64					
11/64	3 7/32	4 ³¹ /32	19/32					
3/16	3 7/16	5 3/16	39/64	5 7/8	8 ¹⁵ /16	1 1/64	7 ¹¹ /16	11 3/4
13/64			5/8					
7/32			41/64					
15/64	3 ¹⁹ /32	5 ¹⁵ /32	21/32	6 1/16	9 1/4	1 1/16	7 ¹¹ /16	11 3/4
1/4	3 ¹³ /16	5 ¹³ /16	43/64					
17/64	4	6 1/8	11/16					
9/32			45/64	6 7/32	9 1/2	1 1/8	7 ²⁹ /32	12 1/8
19/64			23/32					
5/16	47/64							
21/64	4 9/32	6 1/2	3/4	6 3/8	9 ²³ /32	1 1/4	7 ²⁹ /32	12 1/8
11/32			49/64					
23/64			25/32					
3/8	4 3/4	7 1/4	51/64	6 ¹⁷ /32	10	1 3/16	8 5/32	12 7/16
25/64			13/16					
13/32			53/64					
27/64	5 1/32	7 ¹¹ /16	27/32	6 ¹⁵ /16	10 9/32	1 7/32	8 5/32	12 7/16
7/16			55/64					
29/64			7/8					

NOTES relating to the tables in 3.1 and 3.2

1 Intermediate sizes

When intermediate sizes are specially required, reference should be made to the general table in 3.3 for the corresponding lengths.

2 Cutting portion

- Tolerance on diameter *d* measured near the point : h8.
For dimensions in inches, direct conversion into inches of the metric values of the tolerance h8.
- Back taper : at the manufacturer's discretion.
- Hand of cutting, unless otherwise specified : right.

3 Shank

These drills are normally made without driving tenon.

4 Tolerance on lengths

See the general table in 3.3.

3.3 General table : Corresponding lengths, in millimetres and in inches, set out as functions of diameter steps

Diameter ranges <i>d</i>				Corresponding lengths			
over	incl.	over	incl.	<i>l</i> ₁	<i>l</i>	<i>l</i> ₁	<i>l</i>
mm		in		mm		in	
0,95	1,06	0.0374	0.0417	33	56	1 5/16	2 7/32
1,06	1,18	0.0417	0.0464	37	60	1 ¹⁵ /32	2 3/8
1,18	1,32	0.0464	0.0520	41	65	1 5/8	2 9/16
1,32	1,50	0.0520	0.0591	45	70	1 ²⁵ /32	2 3/4
1,50	1,70	0.0591	0.0669	50	76	1 ³¹ /32	3
1,70	1,90	0.0669	0.0748	53	80	2 3/32	3 5/32
1,90	2,12	0.0748	0.0835	56	85	2 7/32	3 ¹¹ /32
2,12	2,36	0.0835	0.0929	59	90	2 5/16	3 ¹⁷ /32
2,36	2,65	0.0929	0.1043	62	95	2 7/16	3 3/4
2,65	3,00	0.1043	0.1181	66	100	2 ¹⁹ /32	3 ¹⁵ /16
3,00	3,35	0.1181	0.1319	69	106	2 ²³ /32	4 3/16
3,35	3,75	0.1319	0.1476	73	112	2 7/8	4 ¹³ /32
3,75	4,25	0.1476	0.1673	78	119	3 1/16	4 ¹¹ /16
4,25	4,75	0.1673	0.1870	82	126	3 7/32	4 ³¹ /32
4,75	5,30	0.1870	0.2087	87	132	3 7/16	5 3/16
5,30	6,00	0.2087	0.2362	91	139	3 ¹⁹ /32	5 ¹⁵ /32
6,00	6,70	0.2362	0.2638	97	148	3 ¹³ /16	5 ¹³ /16
6,70	7,50	0.2638	0.2953	102	156	4	6 1/8
7,50	8,50	0.2953	0.3346	109	165	4 9/32	6 1/2
8,50	9,50	0.3346	0.3740	115	175	4 ¹⁷ /32	6 7/8
9,50	10,60	0.3740	0.4173	121	184	4 3/4	7 1/4
10,60	11,80	0.4173	0.4646	128	195	5 1/32	7 ¹¹ /16
11,80	13,20	0.4646	0.5197	134	205	5 9/32	8 1/16
13,20	14,00	0.5197	0.5512	140	214	5 1/2	8 7/16
14,00	15,00	0.5512	0.5906	144	220	5 ¹¹ /16	8 ²¹ /32
15,00	16,00	0.5906	0.6299	149	227	5 7/8	8 ¹⁵ /16
16,00	17,00	0.6299	0.6693	154	235	6 1/16	9 1/4
17,00	18,00	0.6693	0.7087	158	241	6 7/32	9 1/2
18,00	19,00	0.7087	0.7480	162	247	6 3/8	9 ²³ /32
19,00	20,00	0.7480	0.7874	166	254	6 ¹⁷ /32	10
20,00	21,20	0.7874	0.8346	171	261	6 ²³ /32	10 9/32
21,20	22,40	0.8346	0.8819	176	268	6 ¹⁵ /16	10 9/16
22,40	23,60	0.8819	0.9291	180	275	7 3/32	10 ¹³ /16
23,60	25,00	0.9291	0.9842	185	282	7 9/32	11 3/32
25,00	26,50	0.9842	1.0433	190	290	7 ¹⁵ /32	11 ¹³ /32
26,50	28,00	1.0433	1.1024	195	298	7 ¹¹ /16	11 3/4
28,00	30,00	1.1024	1.1811	201	307	7 ²⁹ /32	12 1/8
30,00	31,50	1.1811	1.2402	207	316	8 5/32	12 7/16

NOTES

1 Tolerance on lengths

Lengths *l* and *l*₁ may vary, within one diameter step, between the minimum and maximum limits corresponding respectively to the figures given for the nearest lower or upper step.

Example : For the diameter 4 mm, length *l*₁ may vary between 73 and 82 mm from the nominal value 78 mm, and length *l* may vary between 112 and 126 mm from the nominal value 119 mm.

2 Recommended diameters in millimetres and in inches : see the tables in 3.1 and 3.2.

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