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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO ~~RECOMMENDATION~~ R 494

PARALLEL SHANK TWIST DRILLS — LONG SERIES

~~1st~~ EDITION
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BRIEF HISTORY

The ISO Recommendation R 494, *Parallel Shank Twist Drills – Long Series*, was drawn up by Technical Committee ISO/TC 29, *Small Tools*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question by the Technical Committee began in 1950, taking into account the studies which had been made by the former International Federation of the National Standardizing Associations (ISA), and led in 1962 to the adoption of a Draft ISO Recommendation.

In April 1964, this Draft ISO Recommendation (No. 663) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Argentina	France	Poland
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

One Member Body opposed the approval of the Draft: U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in August 1966, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 494 August 1966

PARALLEL SHANK TWIST DRILLS
LONG SERIES

INTRODUCTION

1. SCOPE AND FIELD OF APPLICATION

This ISO Recommendation relates to twist drills and deals with parallel shank twist drills, long series.

It supplements ISO Recommendation R 235, *Parallel Shank Twist Drills, Jobber and Stub Series, and Morse Taper Shank Twist Drills*.

Other types of twist drills will be dealt with in further ISO Recommendations as and when current work on them is completed.

This ISO Recommendation 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.

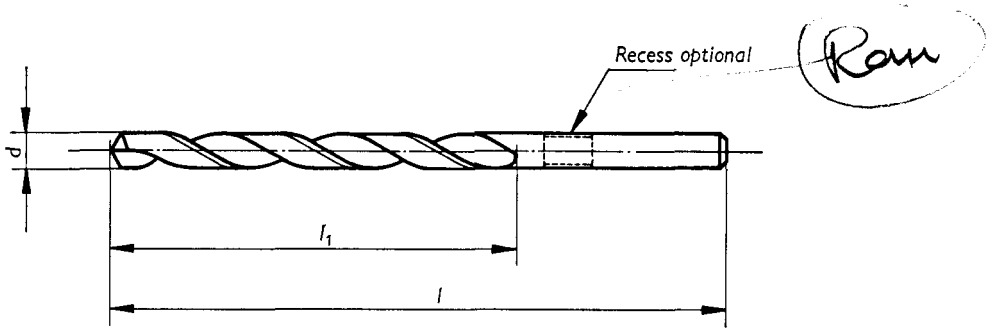
The recommended diameters in the two systems of units of measurement differ, however, and the number of recommended diameters, in a given step, also differs in one system from that in the other.

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.

* See ISO Recommendation R 286, *ISO System of Limits and Fits — Part I: General, Tolerances and Deviations*.

3 DIMENSIONS

~~1. PARALLEL SHANK TWIST DRILLS, LONG SERIES~~



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	78	119	6.40			9.00		
1.30			3.90			6.50			9.10		
1.40	45	70	4.00			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	82	126	6.90			9.50		
1.80	53	80	4.40			7.00			9.60	121	184
1.90			4.50			7.10	102	156	9.70		
2.00	56	85	4.60			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		
2.40	62	95	5.00	87	132	7.60			10.20		
2.50			5.10			7.70			10.30		
2.60			5.20			7.80			10.40		
2.70	66	100	5.30			7.90			10.50		
2.80			5.40			8.00	109	165	10.60		
2.90			5.50			8.10			10.70	128	195
3.00			5.60			8.20			10.80		
3.10	69	106	5.70	91	139	8.30			10.90		
3.20			5.80			8.40			11.00		
3.30			5.90			8.50			11.10		
3.40	73	112	6.00			8.60	115	175	11.20		
3.50			6.10	97	148	8.70			11.30		

Recommended dimensions in millimetres *(concluded)*

d	l_1	l	d	l_1	l	d	l_1	l	d	l_1	l
11.40	128	195	13.90	140	214	20.00	166	254	26.25	190	290
11.50			14.00			20.25	171	261	26.50		
11.60			14.25	144	220	20.50			26.75	195	298
11.70			14.50			20.75			27.00		
11.80			14.75			21.00			27.25		
11.90	134	205	15.00	149	227	21.25	176	268	27.50		
12.00			15.25			21.50			27.75		
12.10			15.50			21.75			28.00		
12.20			15.75			22.00			28.25	201	307
12.30			16.00			22.25			28.50		
12.40			16.25	154	235	22.50	180	275	28.75		
12.50			16.50			22.75			29.00		
12.60			16.75			23.00			29.25		
12.70			17.00			23.25			29.50		
12.80			17.25	158	241	23.50			29.75		
12.90			17.50			23.75	185	282	30.00		
13.00			17.75			24.00			30.25	207	316
13.10			18.00			24.25			30.50		
13.20			18.25	162	247	24.50			30.75		
13.30	140	214	18.50			24.75			31.00		
13.40			18.75			25.00			31.25		
13.50			19.00			25.25	190	290	31.50		
13.60			19.25	166	254	25.50					
13.70			19.50			25.75					
13.80			19.75			26.00					

3.2 Recommended dimensions in inches

d	l_1	l	d	l_1	l	d	l_1	l
3/64	1 5/8	2 9/16	15/32	5 9/32	8 1/16	57/64	7 3/32	10 13/16
1/16	1 31/32	3	31/64			29/32		
5/64	2 7/32	3 11/32	1/2			59/64		
3/32	2 7/16	3 3/4	33/64			15/16	7 9/32	11 3/32
7/64	2 19/32	3 15/16	17/32	5 1/2	8 7/16	61/64		
1/8	2 23/32	4 3/16	35/64			31/32		
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			1		
11/64	3 7/32	4 31/32	19/32	5 7/8	8 15/16	1 1/64		
3/16	3 7/16	5 3/16	39/64			1 1/32		
13/64			5/8			1 3/64	7 11/16	11 3/4
7/32	3 19/32	5 15/32	41/64	6 1/16	9 1/4	1 1/16		
15/64			21/32			1 5/64		
1/4	3 13/16	5 13/16	43/64	6 7/32	9 1/2	1 3/32		
17/64	4	6 1/8	11/16			1 7/64	7 29/32	12 1/8
9/32			45/64			1 1/8		
19/64	4 9/32	6 1/2	23/32	6 3/8	9 23/32	1 9/64		
5/16			47/64			1 5/32		
21/64			3/4	6 17/32	10	1 11/64		
11/32	4 17/32	6 7/8	49/64			1 3/16	8 5/32	12 7/16
23/64			25/32			1 13/64		
3/8	4 3/4	7 1/4	51/64	6 23/32	10 9/32	1 7/32		
25/64			13/16			1 15/64		
13/32			53/64					
27/64	5 1/32	7 11/16	27/32	6 15/16	10 9/16			
7/16			55/64					
29/64			7/8					

NOTES relating to Tables ~~1.1 and 1.2~~ in 3.1 and 3.2

1) *Intermediate sizes*

When intermediate sizes are specially required, reference should be made to the General Table ~~1.3~~ 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 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 General Table ~~1.3~~ in 3.3.

* See ISO Recommendation R 286, *ISO System of Limits and Fits – Part 1: General, Tolerances and Deviations.*