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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 238

REDUCTION SLEEVES AND EXTENSION SOCKETS FOR TOOLS WITH MORSE TAPER SHANKS

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 238, *Reduction Sleeves and Extension Sockets for Tools with Morse Taper Shanks*, 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 1952 and led, in 1958, to the adoption of a Draft ISO Recommendation.

In September 1959, this Draft ISO Recommendation (No. 304) 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:

Belgium	India	Romania
Burma	Italy	Sweden
Czechoslovakia	Mexico	Switzerland
France	Netherlands	United Kingdom
Germany	Pakistan	U.S.S.R.
Greece	Poland	
Hungary	Portugal	

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 December 1961, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 238 December 1961

REDUCTION SLEEVES AND EXTENSION SOCKETS FOR TOOLS WITH MORSE TAPER SHANKS

INTRODUCTION

I. SCOPE

This ISO Recommendation relates to the following two pieces of equipment:

1. Reduction sleeves for tools with Morse taper shanks . . . . . Tables 1.1 and 1.2,
2. Extension sockets for tools with Morse taper shanks . . . . . Tables 2.1 and 2.2.

For each of them, the ISO Recommendation comprises two tables giving respectively:

(1) the dimensions in millimetres and

(2) the corresponding dimensions in inches.

II. INTERCHANGEABILITY

The numerical values given in this ISO Recommendation, whether in millimetres or in inches, automatically ensure interchangeability with the corresponding machines and tools, whatever the system of units employed.

The mating dimensions of the sleeves and sockets are in fact in accordance with those specified in the ISO Recommendation R ...* for Morse taper shanks, which were determined so as to give the same guarantee of interchangeability.

III. REDUCTION SLEEVES

In the reduction sleeves dealt with in Tables 1.1 and 1.2, in millimetres and in inches, the inside taper is always strictly the same as the standard Morse taper of the same number, even in its length.

The same applies to the outside taper, except for the length, however, which is sometimes equal to, sometimes greater than, that of the standard taper of the same number.

IV. EXTENSION SOCKETS

The statements made above concerning the Morse taper dimensions of the reduction sleeves are equally applicable to the extension sockets, under the same conditions.

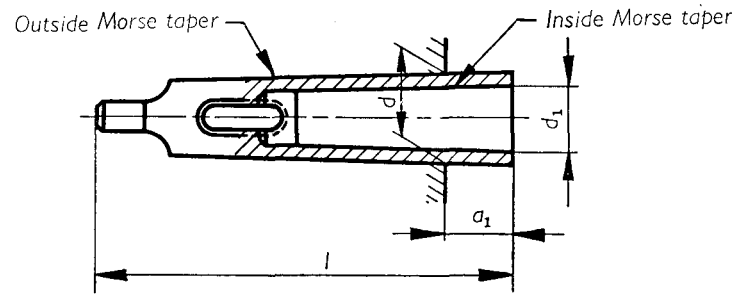
Tables 2.1 and 2.2, in millimetres and in inches, also specify for the latter the diameter of the parallel portion and the minimum value for the total length l_2.

Lengths l_2 above this minimum should be selected to suit requirements, but preference should be given to multiples of 5 mm or $^1/_4$ inch, or even 10 mm or $^1/_2$ inch**.

* In course of preparation.

** It is the responsibility of each ISO Member Body to specify this minimum in its national standard, giving either the minimum value shown in the tables or the slightly larger one indicated in the relevant note as "Reinforced minimum".

1. REDUCTION SLEEVES FOR TOOLS WITH MORSE TAPER SHANKS



Example of the method of designating a reduction sleeve with outside Morse taper 4, and inside Morse taper 2:

Reduction sleeve Morse 4×2.

1.1 Dimensions in millimetres

Outside taper				Inside taper	
M.T.	d	l	a_1	M.T.	d_1
2	17.780	92	17	1	12.065
3	23.825	99	5	1	12.065
		112	18	2	17.780
4	31.267	124	6.5	(1)	12.065
				2	17.780
		140	22.5	3	23.825
5	44.399	156	6.5	(1)	12.065
				(2)	17.780
				3	23.825
		171	21.5	4	31.267
6	63.348	218	8	(1)	12.065
				(2)	17.780
				3	23.825
				4	31.267
				5	44.399

The use of those sizes where the inside taper is shown in brackets should be avoided whenever possible.

1.2 Dimensions in inches

Outside taper				Inside taper	
M.T.	d	l	a_1	M.T.	d_1
2	0.700	$3\frac{5}{8}$	$\frac{11}{16}$	1	0.475
3	0.938	$3\frac{7}{8}$	$\frac{3}{16}$	1	0.475
		$4\frac{3}{8}$	$\frac{11}{16}$	2	0.700
4	1.231	$4\frac{7}{8}$	$\frac{1}{4}$	(1)	0.475
				2	0.700
		$5\frac{1}{2}$	$\frac{7}{8}$	3	0.938
5	1.748	$6\frac{1}{8}$	$\frac{1}{4}$	(1)	0.475
				(2)	0.700
				3	0.938
		$6\frac{3}{4}$	$\frac{27}{32}$	4	1.231
6	2.494	$8\frac{9}{16}$	$\frac{5}{16}$	(1)	0.475
				(2)	0.700
				3	0.938
				4	1.231
				5	1.748

The use of those sizes where the inside taper is shown in brackets should be avoided whenever possible.

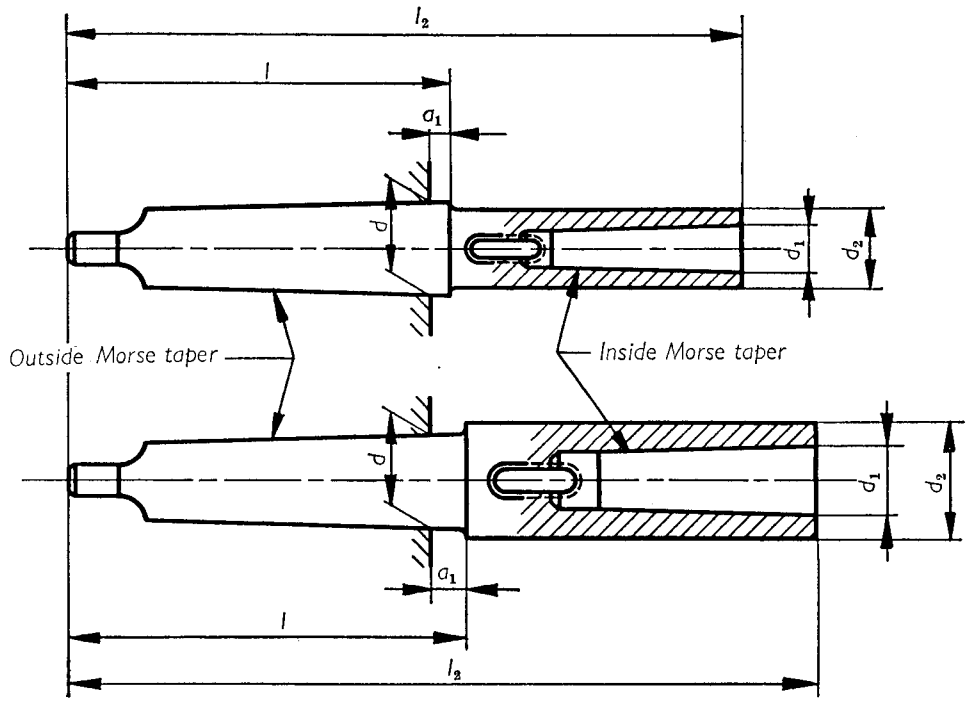
NOTE relating to Tables 1.1 and 1.2

Morse taper

in accordance with ISO Recommendation R ...* dealing with 5 per cent tapers for tool shanks (except for the dimensions a_1 and l which are greater for certain tools than the corresponding dimensions a and l_2 given in that ISO Recommendation).

* In course of preparation

2. EXTENSION SOCKETS FOR TOOLS WITH MORSE TAPER SHANKS



Example of the method of designating an extension socket with outside Morse taper 4 and inside Morse taper 2:
Extension socket Morse 4×2.

2.1 Dimensions in millimetres

Outside taper				Inside taper			
M.T. No.	d	l	a_1	M.T. No.	d_1	d_2	l_2*
1	12.065	69	7	1	12.065	20	145
				(2)	17.780	30	160
2	17.780	84	9	1	12.065	20	160
				2	17.780	30	175
				(3)	23.825	36	196
3	23.825	99	5	1	12.065	20	175
		103	9	2	17.780	30	194
				3	23.825	36	215
				(4)	31.267	48	240
4	31.267	124	6.5	(1)	12.065	20	200
				2	17.780	30	215
		128	10.5	3	23.825	36	240
				4	31.267	48	265
				(5)	44.399	63	300
5	44.399	156	6.5	(1)	12.065	20	232
				(2)	17.780	30	247
				3	23.825	36	268
		163	13.5	4	31.267	48	300
				5	44.399	63	335
6	63.348	218	8	(1)	12.065	20	294
				(2)	17.780	30	309
				(3)	23.825	36	330
				4	31.267	48	355
				5	44.399	63	390

The use of those sizes where the inside taper is shown in brackets should be avoided whenever possible.

* See note 1, page 7.

2.2 Dimensions in inches

Outside taper				Inside taper			
M.T.	d	l	a_1	M.T.	d_1	d_2	l_2* min.
1	0.475	$2^3/_4$	$^9/_{32}$	1	0.475	0.787	$5^3/_4$
				(2)	0.700	1.181	$6^3/_8$
2	0.700	$3^3/_8$	$^{11}/_{32}$	1	0.475	0.787	$6^3/_8$
				2	0.700	1.181	$6^7/_8$
				(3)	0.938	1.417	$7^3/_4$
3	0.938	$3^7/_8$	$^3/_{16}$	1	0.475	0.787	$6^7/_8$
		$4^1/_8$	$^{11}/_{32}$	2	0.700	1.181	$7^5/_8$
				3	0.938	1.417	$8^1/_2$
				(4)	1.231	1.890	$9^3/_8$
4	1.231	$4^7/_8$	$^1/_4$	(1)	0.475	0.787	$7^7/_8$
				2	0.700	1.181	$8^1/_2$
		5	$^{13}/_{32}$	3	0.938	1.417	$9^3/_8$
				4	1.231	1.890	$10^1/_2$
				(5)	1.748	2.480	$11^7/_8$
5	1.748	$6^1/_8$	$^1/_4$	(1)	0.475	0.787	$9^1/_8$
				(2)	0.700	1.181	$9^3/_4$
				3	0.938	1.417	$10^5/_8$
		$6^3/_8$	$^{17}/_{32}$	4	1.231	1.890	$11^7/_8$
				5	1.748	2.480	$13^1/_4$
6	2.494	$8^9/_{16}$	$^5/_{16}$	(1)	0.475	0.787	$11^5/_8$
				(2)	0.700	1.181	$12^1/_8$
				(3)	0.938	1.417	13
				4	1.231	1.890	14
				5	1.748	2.480	$15^3/_8$

The use of those sizes where the inside taper is shown in brackets should be avoided whenever possible.

* See note 1, below.

NOTES relating to Tables 2.1 and 2.2

1. *Minimum length*

The minimum shown for l_2 is the normal. The minimum described as "reinforced" comprises the same values, increased as follows:

5 mm or $^1/_4$ in for extension sockets with inside tapers 1 to 3,
10 mm or $^1/_2$ in for those with inside tapers 4 and 5.

For the choice of length l_2 above the minimum shown above, give preference, to suit requirements, to lengths in multiples of

5 mm or $^1/_4$ in
10 mm or $^1/_2$ in

2. *Morse tapers*

Morse tapers are in accordance with ISO Recommendation R . . .** dealing with 5 per cent tapers for tool shanks (except for the dimensions a_1 and l which are greater for certain tools than the corresponding dimensions a and l_2 given in this ISO Recommendation).

** In course of preparation.