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Reduction sleeves and extension sockets for tools with Morse taper shanks

Douilles de réduction et allonges pour outils au cône Morse

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 29, *Small tools*, Subcommittee SC 2, *Holding tools, adaptive items and interfaces*.

This second edition cancels and replaces the first edition (ISO 238:1974), of which it constitutes a minor revision, notably with the addition of Annex A, which gives the relationship between the designations of this document and the ISO 13399 series.

Reduction sleeves and extension sockets for tools with Morse taper shanks

1 Scope

This document specifies the dimensions of the following two pieces of equipment:

a) reduction sleeves for tools with Morse taper shanks;

b) extension sockets for tools with Morse taper shanks.

It comprises, for each of them, two tables giving the dimensions in millimetres and the corresponding dimensions in inches, respectively.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Interchangeability

4.1 General

The numerical values given, 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 ISO 296 for Morse taper shanks, which were determined so as to give the same guarantee of interchangeability.

4.2 Reduction sleeves

In the reduction sleeves 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 which is sometimes equal to or sometimes greater than that of the standard taper of the same number.

4.3 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.

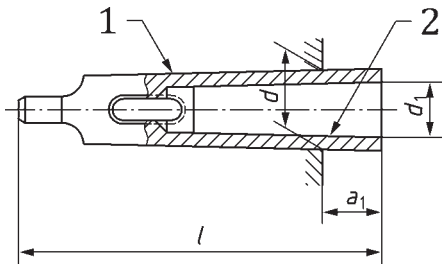
Table 3 and Table 4 also specify, for the latter, the diameter of the parallel portion and the minimum value for the total length l_2.

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.

NOTE This minimum will be either the minimum value shown in the tables or the slightly larger one indicated in the relevant note as "reinforced minimum".

5 Reduction sleeves for tools with Morse taper shanks

An example of a method of designating a reduction sleeve with outside Morse taper 4 and inside Morse taper 2 is shown in Figure 1.



Key

1 outside Morse taper

2 inside Morse taper

Figure 1 — Reduction sleeve Morse 4 × 2

Table 1 — Dimensions (mm)

Dimensions in millimetres

Outside taper				Inside taper	
M.T. No.	d	l	a_1	M.T. No.	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.

Morse tapers are in accordance with ISO 296 dealing with self-holding 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 ISO 296).

Table 2 — Dimensions (inches)

Dimensions in inches

Outside taper				Inside taper	
M.T. No.	d	l	a_1	M.T. No.	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

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

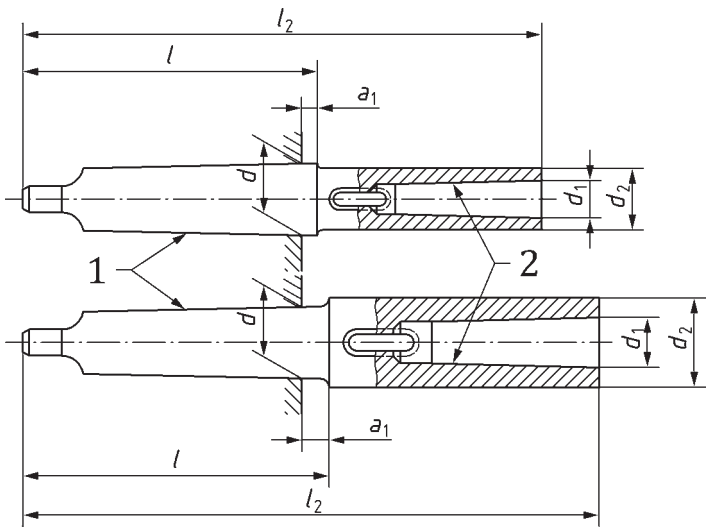
Morse tapers are in accordance with ISO 296 dealing with self-holding tapers for tool shanks (except for the dimensions a_1 and l which are greater for certain tools than the corresponding dimensions a and l_2 given in ISO 296).

Table 2 *(continued)*

Outside taper				Inside taper	
M.T. No.	d	l	a_1	M.T. No.	d_1
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.					
Morse tapers are in accordance with ISO 296 dealing with self-holding 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 ISO 296).					

6 Extension sockets for tools with Morse taper shanks

An example of the method of designating an extension socket with outside Morse taper 4 and inside Morse taper 2 is shown in Figure 2.



Key

1 outside Morse taper

2 inside Morse taper

Figure 2 — Extension socket Morse 4 × 2

Table 3 — Dimensions (mm)

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.

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

— 5 mm or ¼ inch for extension sockets with inside tapers 1 to 3;

— 10 mm or ½ inch 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 ¼ inch, and

— 10 mm or ½ inch.

Morse tapers are in accordance with ISO 296 dealing with self-holding 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 ISO 296).

Table 4 — Dimensions (inches)

Dimensions in inches

Outside taper				Inside taper			
M.T. No.	d	l	a_1	M.T. No.	d_1	d_2	l_2 min.
1	0,475	$2\frac{3}{4}$	$\frac{3}{32}$	1	0,475	0,787	$5\frac{3}{4}$
				(2)	0,700	1,181	$6\frac{3}{8}$
2	0,700	$3\frac{3}{8}$	$\frac{11}{32}$	1	0,475	0,787	$6\frac{3}{8}$
				2	0,700	1,181	$6\frac{7}{8}$
				(3)	0,938	1,417	$7\frac{3}{4}$
3	0,938	$3\frac{7}{8}$	$\frac{3}{16}$	1	0,475	0,787	$6\frac{7}{8}$
		$4\frac{1}{8}$	$\frac{11}{32}$	2	0,700	1,181	$7\frac{5}{8}$
				3	0,938	1,417	$8\frac{1}{2}$
				(4)	1,231	1,890	$9\frac{3}{8}$
4	1,231	$4\frac{7}{8}$	$\frac{1}{4}$	(1)	0,475	0,787	$7\frac{7}{8}$
				2	0,700	1,181	$8\frac{1}{2}$
		5	$\frac{13}{32}$	3	0,938	1,417	$9\frac{3}{8}$
				4	1,231	1,890	$10\frac{1}{2}$
				(5)	1,748	2,480	$11\frac{7}{8}$
5	1,748	$6\frac{1}{8}$	$\frac{1}{4}$	(1)	0,475	0,787	$9\frac{1}{8}$
				(2)	0,700	1,181	$9\frac{3}{4}$
				3	0,938	1,417	$10\frac{3}{8}$
		$6\frac{3}{8}$	$\frac{17}{32}$	4	1,231	1,890	$11\frac{7}{8}$
				5	1,748	2,480	$13\frac{1}{4}$

Table 4 *(continued)*

Outside taper				Inside taper			
M.T. No.	d	l	a_1	**M.T. No.**	d_1	d_2	l_2 min.
6	2,494	$8\frac{9}{16}$	$\frac{5}{16}$	(1)	0,475	0,787	$11\frac{5}{8}$
				(2)	0,700	1,181	$12\frac{1}{8}$
				(3)	0,938	1,417	13
				4	1,231	1,890	14
				5	1,748	2,480	$15\frac{3}{8}$

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

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

— 5 mm or ¼ inch for extension sockets with inside tapers 1 to 3;

— 10 mm or ½ inch 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 ¼ inch, and

— 10 mm or ½ inch.

Morse tapers are in accordance with ISO 296 dealing with self-holding 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 ISO 296).

Annex A
(informative)

Relationship between designations in this document and ISO 13399

For relationship between designations in this document and preferred symbols according to ISO 13399, see Table A.1.

Table A.1 — Relationship between designations in this International Standard and ISO 13399

Symbol in this document	Reference in this document	Property name in the ISO 13399 series	Symbol in the ISO 13399 series	Reference in the ISO 13399 series
M.T. No. outside taper	Figure 1, Figure 2 Table 1, Table 2, Table 3 and Table 4	connection size code machine side	CZCMS	71EBDBF5060E6
M.T. No. inside taper	Figure 1, Figure 2 Table 1, Table 2, Table 3 and Table 4	connection size code workpiece side	CZCWS	727C2BCBC1684
l	Figure 1 Table 1 and Table 2	overall length	OAL	71D078EB7C086
l_2	Figure 2 Table 3 and Table 4	overall length	OAL	71D078EB7C086

Bibliography

[1] ISO 296, *Machine tools — Self-holding tapers for tool shanks*

[2] ISO 13399 (all parts), *Cutting tool data representation and exchange*

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