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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 297

7/24 TAPERS FOR TOOL SHANKS

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BRIEF HISTORY

The ISO Recommendation R 297, *7/24 Tapers foor Tool Shanks*, was drawn up by Technical Committee ISO/TC 39, *Machine 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 1955, to the adoption of a Draft ISO Recommendation.

In July 1960, this Draft ISO Recommendation (No. 389) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Argentina	Germany	Poland
Australia	Hungary	Portugal
Belgium	India	Romania
Chile	Israel	Spain
Colombia	Italy	Sweden
Czechoslovakia	Japan	Switzerland
Denmark	Netherlands	United Kingdom
France	New Zealand	U.S.A.
		U.S.S.R.

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1963, to accept it as an ISO Recommendation.

ISO Recommendation R 297 March 1963

7/24 TAPERS FOR TOOL SHANKS

1. INTRODUCTION

The following tables deal with $^{7}/_{24}$ tapers. They relate

on the one hand, to spindle noses	Table 1, page 4, for millimetre sizes, and Table 2, page 5, for inch sizes,
on the other hand, to tool shanks	Table 3, page 6, for millimetre sizes, and Table 4, page 7, for inch sizes.

This type of taper is designed especially for milling machine spindle noses, as well as for the corresponding tool shanks, and for this reason it is hoped to prepare a more comprehensive ISO Recommendation which will deal with "Spindle Noses with $^{7}/_{24}$ Tapers for Milling Machines".

2. INTERCHANGEABILITY

The present ISO Recommendation provides, as regards threads, two entirely distinct types of products according to the type of thread, **M** or **UNC**.

In order to distinguish between those two types, it is important that the component itself be marked with the corresponding thread symbol, each national standards body being free to adopt, in its national standard, either of the two threads.

For all other sizes, however, the products manufactured either to metric or to inch sizes are strictly interchangeable, though not absolutely identical. Acceptance conditions, if provided for in national standards, should therefore be such as to allow for the acceptance of products specified either in inch or metric sizes.

3. 7/24 TAPERS FOR SPINDLE NOSES

3.1 Sizes in millimetres (6)

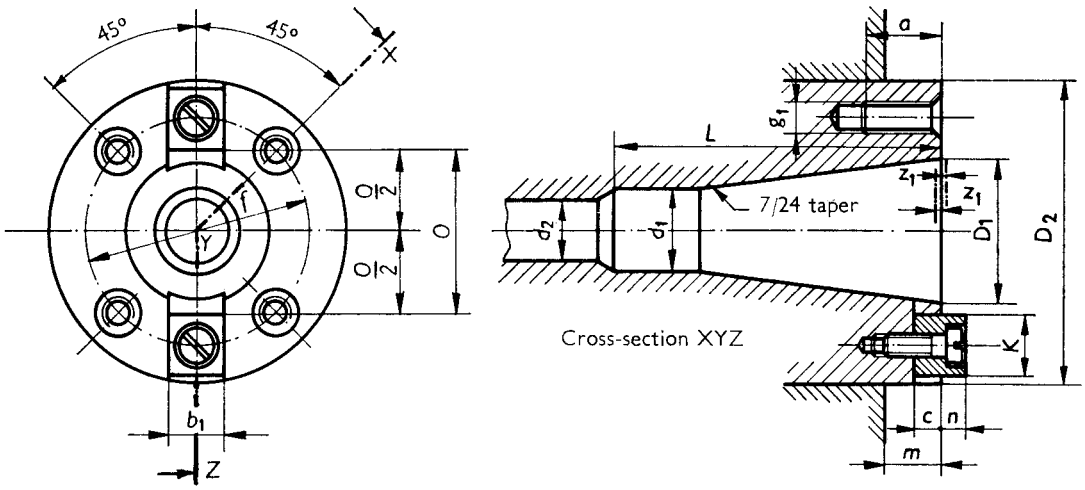

TABLE 1. — **7/24 tapers for spindle noses**

Designation		No. 30	No. 40	No. 50	No. 60
D_1	(1)	31.750	44.450	69.850	107.950
D_2	h5	69.832	88.882	128.570	221.440
d_1	H12	17.4	25.3	39.6	60.2
d_2	min.	17	17	27	35
L	min.	73	100	140	220
g_1	(2)	M 10	M 12	M 16	M 20
a	min.	16	20	25	30
f	(3)	54	66.7	101.6	177.8
m	min.	12.5	16	19	38
n	max.	8	8	12.5	12.5
$\frac{O}{2}$	min.	16.5	23	36	61
b_1	(4)	15.9	15.9	25.4	25.4
c	min.	8	8	12.5	12.5
K	max.	16.5	19.5	26.5	45.5
z_1	(5)	0.4	0.4	0.4	0.4
v	(4)	± 0.03	± 0.03	± 0.04	± 0.04

(1) D_1 = basic size.

(2) g_1 = thread diameter: this is either a metric thread **M** with standard pitch or, if expressly stated, a **UNC** thread (see Table 2 for sizes in inches). In every case, the appropriate symbol **M** or **UNC** should be marked on the component.

(3) Tolerance on the position of fixing holes (maximum radial deviation from their theoretical position):

No. 30 and No. 40: 0.075 mm,
No. 50 and No. 60: 0.100 mm.

(4) M6/h5 fit for the assembly of the tenon in its slot. The dimension v corresponds to the permissible eccentricity of the tenon b_1: it is the distance between the mid-plane of the tenon and the spindle nose axis.

(5) z_1 = maximum permissible deviation, on either side of the leading face, of the position of the gauge plane D_1 from the nominal position of coincidence with the leading face.

(6) For sizes in inches, see Table 2.

3.2 Sizes in inches (6)

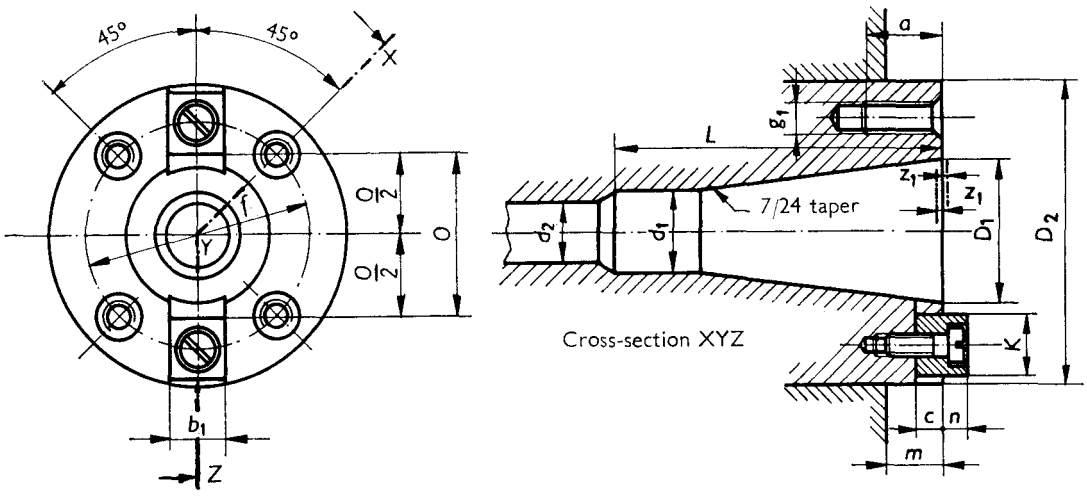

TABLE 2. — **7/24 tapers for spindle noses**

Designation		No. 30	No. 40	No. 50	No. 60
D_1	(1)	1 1/4	1 3/4	2 3/4	4 1/4
D_2	h5	2.7493	3.4993	5.0618	8.7180
d_1		0.692 0.685	1.005 0.997	1.568 1.559	2.381 2.371
d_2	min.	21/32	21/32	1 1/16	1 3/8
L	min.	2 7/8	3 7/8	5 1/2	8 5/8
g_1	(2)	UNC 3/8	UNC 1/2	UNC 5/8	UNC 3/4
a	min.	5/8	13/16	1	1 1/4
f	(3)	2.125	2.625	4.000	7.000
m	min.	1/2	5/8	3/4	1 1/2
n	max.	5/16	5/16	1/2	1/2
$\frac{O}{2}$	min.	0.655	0.905	1.405	2.415
b_1	(4)	0.6255 0.6252	0.6255 0.6252	1.0006 1.0002	1.0006 1.0002
c	min.	5/16	5/16	1/2	1/2
K	max.	5/8	3/4	1	1 3/4
z_1	(5)	1/64	1/64	1/64	1/64
v	(4)	± 0.0012	± 0.0012	± 0.0016	± 0.0016

(1) D_1 = basic size.

(2) g_1 = thread diameter: this is either a **UNC** thread or, if expressly stated, a metric thread **M** with standard pitch (see Table 1 for sizes in millimetres). In every case, the appropriate symbol **UNC** or **M** should be marked on the component.

(3) Tolerance on the position of fixing holes (maximum radial deviation from their theoretical position):

No. 30 and No. 40: 0.003 in,
No. 50 and No. 60: 0.005 in.

(4) For the assembly of the tenon in its slot, fit as for key in shaft. The dimension v corresponds to the permissible eccentricity of the tenon b_1: it is the distance between the mid-plane of the tenon and the spindle nose axis.

(5) z_1 = maximum permissible deviation, on either side of the leading face, of the position of the gauge plane D_1 from the nominal position of coincidence with the leading face.

(6) For sizes in millimetres, see Table 1.

4. 7/24 TAPERS FOR TOOL SHANKS

4.1 Sizes in millimetres (6)

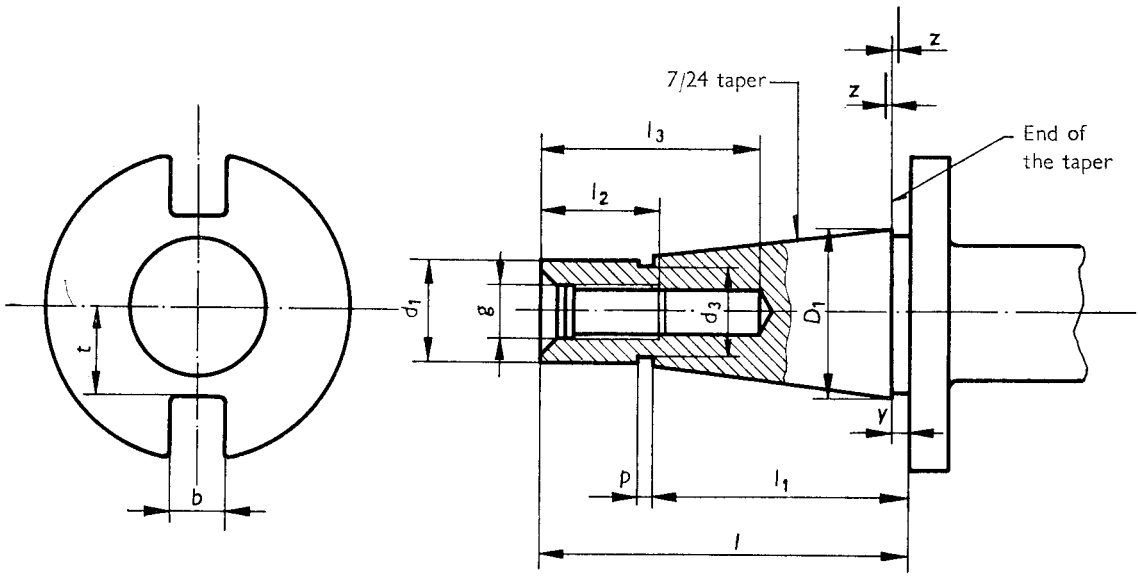

TABLE 3. — **7/24 tapers for tool shanks**

Designation	No. 30	No. 40	No. 50	No. 60
D_1 (1)	31.750	44.450	69.850	107.950
d_1 a10	17.4	25.3	39.6	60.2
l max.	70	95	130	210
l_1	50	67	105	165
g (2)	M 12	M 16	M 24	M 30
l_2	24	30	45	56
l_3 min.	50	70	90	110 or 160 (3)
d_3	16.5	24	38	58
b H12(4)	16.1	16.1	25.7	25.7
t max.	16.2	22.5	35.3	60
p	3	5	8	10
y	1.6	1.6	3.2	3.2
z (5)	0.4	0.4	0.4	0.4
w (4)	± 0.06	± 0.06	± 0.10	± 0.10

(1) D_1 = basic size.

(2) g = thread diameter: this is either a metric thread **M** with standard pitch or, if expressly stated, a **UNC** thread (see Table 4 for sizes in inches). In every case, the appropriate symbol **M** or **UNC** should be marked on the component.

(3) l_3 = for No. 60, two alternative values are included: only the value 160 allows for the use of reducing sockets.

(4) The dimension w corresponds to the permissible eccentricity of the slot b: it is the distance between the mid-plane of the slot and the tool shank axis.

(5) z = maximum permissible deviation, on either side of the end of the taper, of the position of the gauge plane D_1 from the nominal position of coincidence with the end of the taper.

(6) For sizes in inches, see Table 4.

4.2 Sizes in inches (6)

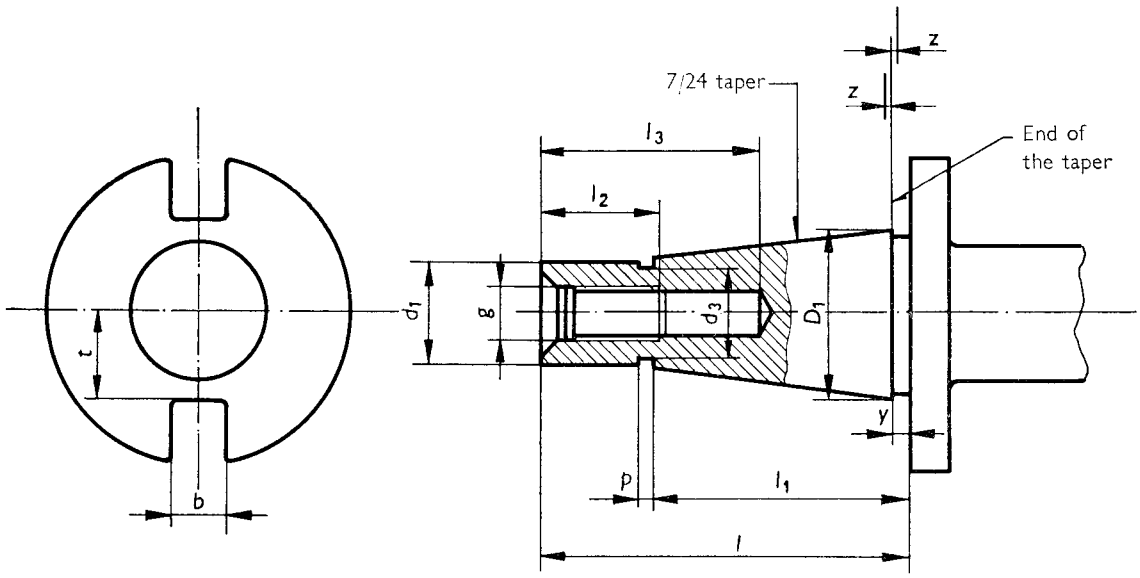

TABLE 4. — **7/24 tapers for too lshanks**

Designation	No. 30	No. 40	No. 50	No. 60
D_1 (1)	1 1/4	1 3/4	2 3/4	4 1/4
d_1	0.675 0.673	0.987 0.985	1.549 1.547	2.361 2.359
l max.	2 3/4	3 3/4	5 1/8	8 1/4
l_1	1 15/16	2 3/4	4 1/8	6 1/2
g (2)	UNC 1/2	UNC 5/8	UNC 1	UNC 1 1/4
l_2	1	1 1/8	1 3/4	2 1/4
l_3 min.	2	2 3/4	3 1/2	4 1/4 or 6 1/4 (3)
d_3	41/64	15/16	1 1/2	2 9/32
b H12(4)	0.635	0.635	1.013	1.013
t max.	0.640	0.890	1.390	2.400
p	1/8	1/4	3/8	3/8
y	1/16	1/16	1/8	1/8
z (5)	1/64	1/64	1/64	1/64
w (4)	±0.0025	±0.0025	±0.0040	±0.0040

(1) D_1 = basic size.

(2) g = thread diameter: this is either a **UNC** thread or, if expressly stated, a metric thread **M** with standard pitch (see Table 3 for sizes in millimetres). In every case, the appropriate symbol **UNC** or **M** should be marked on the component.

(3) l_3 = for No. 60, two alternative values are included: only the value 6 1/4 allows for the use of reducing sockets.

(4) The dimension w corresponds to the permissible eccentricity of the slot b: it is the distance between the mid-plane of the slot and the tool shank axis.

(5) z = maximum permissible deviation, on either side of the end of the taper, of the position of the gauge plane D_1 from the nominal position of coincidence with the end of the taper.

(6) For sizes in millimetres, see Table 3.

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November 1963

Price: Sw. fr. 5.25

ERRATUM

Page 5, clause 3.2

In place of the figure above Table 2, substitute the following