BS ISO 1641-3:2011

BSI Standards Publication

End mills and slot drills

Part 3: Dimensions and designation of milling cutters with 7/24 taper shanks

National foreword

This British Standard is the UK implementation of ISO 1641-3:2011. It supersedes BS ISO 1641-3:2003 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MTE/18, Tools tips and inserts for cutting applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

ISO 1641-3

Third edition
2011-06-15

End mills and slot drills —

Part 3: Dimensions and designation of milling cutters with 7/24 taper shanks

Fraises cylindriques 2 tailles et fraises à rainurer —

Partie 3: Dimensions et désignation des fraises à queue cône 7/24

Reference number
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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 1641-3 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 2, *High speed steel cutting tools and their attachments*.

This third edition cancels and replaces the second edition (ISO 1641-3:2003), of which it constitutes a minor revision. In particular, this includes updating of the normative references, addition of the designation (see Clause 4) and indication of the tolerance classes in accordance with ISO 2768-1 and ISO 2768-2.

ISO 1641 consists of the following parts, under the general title *End mills and slot drills*:

— *Part 1: Milling cutters with cylindrical shanks*

— *Part 2: Dimensions and designation of milling cutters with Morse taper shanks*

— *Part 3: Dimensions and designation of milling cutters with 7/24 taper shanks*

INTERNATIONAL STANDARD **ISO 1641-3:2011(E)**

End mills and slot drills —

Part 3: Dimensions and designation of milling cutters with 7/24 taper shanks

1 Scope

This part of ISO 1641 specifies the general dimensions and designation of the following milling cutters with 7/24 taper shanks:

— end mills, flat-ended or ball-nosed — normal series and long series (manual changers);

— slot drills — short series and normal series (manual changers);

— end mills, flat-ended — normal series and long series (automatic changers).

Tool shanks with 7/24 taper for manual tool changers are in accordance with ISO 297. Tool shanks with 7/24 taper for automatic tool changers are in accordance with ISO 7388-1 and ISO 7388-2.

It is not applicable to end mills and slot drills with cylindrical shank, which are dealt with in ISO 1641-1; it is not applicable to those with Morse taper shank, which are dealt with in ISO 1641-2.

This part of ISO 1641 is not applicable to solid hardmetal end mills and slot drills.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 297, *7/24 tapers for tool shanks for manual changing*

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*

ISO 7388-1, *Tool shanks with 7/24 taper for automatic tool changers — Part 1: Dimensions and designation of shanks of forms A, AD, AF, U, UD and UF*

ISO 7388-2, *Tool shanks with 7/24 taper for automatic tool changers — Part 2: Dimensions and designation of shanks of forms J, JD and JF*

3 Dimensions

3.1 General

All dimensions and tolerances are given in millimetres. Tolerances not specified shall be of tolerance class “m” in accordance with ISO 2768-1 and of class “K” in accordance with ISO 2768-2.

3.2 7/24 taper shanks for manual tool changers

3.2.1 General

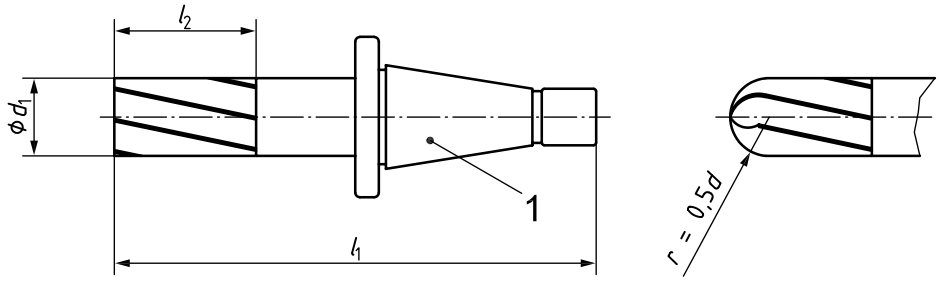
The values, l_1 and l_2, shall be chosen such that the difference in length ($l_1 - l_2$) remains constant whatever the series (short, normal or long), according to Table 1.

Table 1 — Length difference ($l_1 - l_2$)

7/24 taper no.	30	40	45	50
($l_1 - l_2$)	105	135	155	177

3.2.2 Flat-ended end mills and ball-nosed cylindrical end mills

The dimensions of flat-ended end mills and ball-nosed cylindrical end mills shall be in accordance with the dimensions shown in Figure 1 and Table 2.



Key

1 7/24 taper shank for manual tool changer in accordance with ISO 297

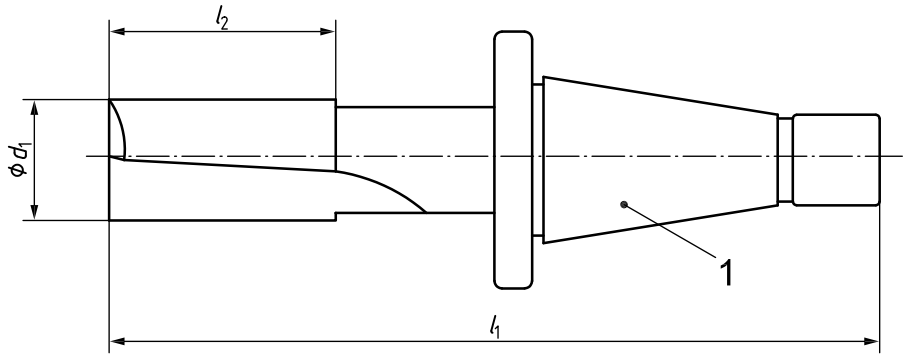
Figure 1 — Flat-ended end mills and ball-nosed cylindrical end mills with 7/24 taper shanks for manual tool changers

Table 2 — Dimensions of ball-nosed end mills and flat-ended cylindrical end mills with 7/24 taper shanks for manual tool changers

Range of diameters, d_1 js14	Recommended diameters, d_1		Length, l_1		Length, l_2		7/24 taper no.
			Normal series	Long series	Normal series	Long series	
$23{,}6 < d_1 \leq 30$	24 and 25	28	150	195	45	90	30
$30 < d_1 \leq 37{,}5$	32	36	158	211	53	106	30
			188	241			40
			208	261			45
$37{,}5 < d_1 \leq 47{,}5$	40	45	198	260	63	125	40
			218	280			45
			240	302			50
$47{,}5 < d_1 \leq 60$	50	56	210	285	75	150	40
			230	305			45
			252	327			50
$60 < d_1 \leq 75$	63	71	245	335	90	180	45
			267	357			50
$75 < d_1 \leq 95$	80	—	283	389	106	212	50

3.2.3 Slot drill

The dimensions of slot drill shall be in accordance with the dimensions shown in Figure 2 and Table 3.



Key

1 7/24 taper shank for manual tool changer in accordance with ISO 297

Figure 2 — Slot drill with 7/24 taper shanks for manual tool changers

Table 3 — Dimensions of slot drill with 7/24 taper shanks for manual tool changers

Range of diameters, d_1 e8	**Recommended diameters**, d_1		**Length**, l_1		**Length**, l_2		**7/24 taper no.**
			Short series	**Normal series**	**Short series**	**Normal series**	
$23{,}6 < d_1 \leq 30$	24 and 25	28	131	150	26	45	30
$30 < d_1 \leq 37{,}5$	32	36	137	158	32	53	30
			167	188			40
			187	208			45
$37{,}5 < d_1 \leq 47{,}5$	40	45	173	198	38	63	40
			193	218			45
			215	240			50
$47{,}5 < d_1 \leq 60$	50	56	180	210	45	75	40
			200	230			45
			222	252			50
$60 < d_1 \leq 75$	63	71	208	245	53	90	45
			230	267			50
$75 < d_1 \leq 95$	80	—	240	283	63	106	50

3.3 7/24 taper shanks for automatic tool changers

3.3.1 General

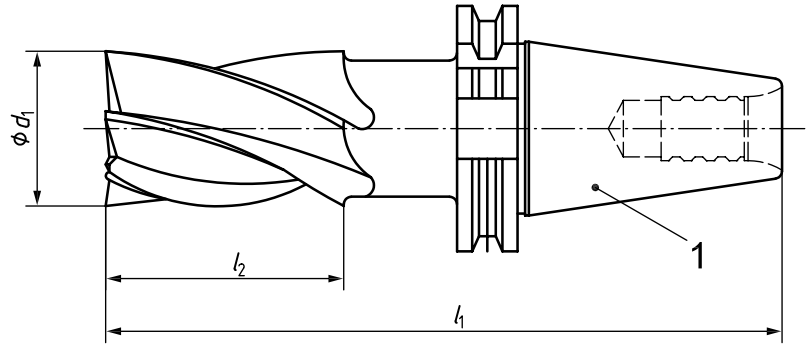
The values, l_1 and l_2, shall be chosen such that the difference in length $(l_1 - l_2)$ remains constant whatever the series (normal or long), according to Table 4.

Table 4 — Length difference $(l_1 - l_2)$

7/24 taper no.	**40**	**50**
$(l_1 - l_2)$	118	156

3.3.2 Flat-ended end mills and ball-nosed cylindrical end mills

The dimensions of flat-ended end mills and ball-nosed cylindrical end mills shall be in accordance with the dimensions shown in Figure 3 and Table 5.



Key

1 7/24 taper shank for automatic tool changer in accordance with ISO 7388-1 and ISO 7388-2

Figure 3 — Flat-ended end mills and ball-nosed cylindrical end mills with 7/24 taper shanks for automatic tool changers

Table 5 — Dimensions of flat-ended end mills and ball-nosed cylindrical end mills with 7/24 taper shanks for automatic tool changers

Range of diameters, d_1 js14	**Recommended diameters**, d_1		**Length**, l_1		**Length**, l_2		**7/24 taper no.**
			Normal series	**Long series**	**Normal series**	**Long series**	
$30 < d_1 \leq 37{,}5$	32	36	171	224	53	106	40
$37{,}5 < d_1 \leq 47{,}5$	40	45	181	243	63	125	40
			219	281			50
$47{,}5 < d_1 \leq 60$	50	56	193	268	75	150	40
			231	306			50
$60 < d_1 \leq 75$	63	71	246	336	90	180	
$75 < d_1 \leq 85$	80	—	262	368	106	212	

4 Designation

4.1 7/24 taper shanks for manual tool changers

4.1.1 Flat-ended end mills and ball-nosed cylindrical end mills

Flat-ended end mills and ball-nosed cylindrical end mills with 7/24 taper shank for manual tool changers in accordance with this part of ISO 1641 shall be designated by:

a) "Flat-ended end mills" or "ball-nosed cylindrical end mills";

b) the reference to this part of ISO 1641, i.e. ISO 1641-3;

c) a hyphen;

d) the recommended diameter, d_1;

e) a hyphen;

f) the 7/24 taper number;

g) a hyphen;

h) letter "m" for "manual tool changers".

EXAMPLE 1 A flat-ended end mill with 7/24 taper shank for manual tool changers in accordance with ISO 1641-3 with recommended diameter $d_1 = 32$ and 7/24 taper no. 40 is designated as follows:

Flat-ended end mills ISO 1641-3 – 32 – 40 – m

EXAMPLE 2 A ball-nosed cylindrical end mill with 7/24 taper shank for manual tool changers in accordance with ISO 1641-3 with recommended diameter $d_1 = 32$ and 7/24 taper no. 40 is designated as follows:

Ball-nosed cylindrical end mills ISO 1641-3 – 32 – 40 – m

4.1.2 Slot drills

Slot drills with 7/24 taper shank for manual tool changers in accordance with this part of ISO 1641 shall be designated by:

a) "Slot drill";

b) the reference to this part of ISO 1641, i.e. ISO 1641-3;

c) a hyphen;

d) the recommended diameter, d_1;

e) a hyphen;

f) the 7/24 taper number;

g) a hyphen;

h) letter "m" for "manual tool changers".

EXAMPLE A slot drill with 7/24 taper shank for manual tool changers in accordance with ISO 1641-3 with recommended diameter $d_1 = 32$ and 7/24 taper no. 40 is designated as follows:

Slot drill ISO 1641-3 – 32 – 40 – m

4.2 7/24 taper shanks for automatic tool changers

Flat-ended end mills and ball-nosed cylindrical end mills with 7/24 taper shank for automatic tool changers in accordance with this part of ISO 1641 shall be designated by:

a) "Flat-ended end mills" or "ball-nosed cylindrical end mills";

b) the reference to this part of ISO 1641, i.e. ISO 1641-3;

c) a hyphen;

d) the recommended diameter, d_1;

e) a hyphen;

f) the 7/24 taper number;

g) a hyphen;

h) letter "a" for "automatic tool changers".

EXAMPLE 1 A flat-ended end mill with 7/24 taper shank for automatic tool changers in accordance with ISO 1641-3 with recommended diameter $d_1 = 32$ and 7/24 taper no. 40 is designated as follows:

Flat-ended end mills ISO 1641-3 – 32 – 40 – a

EXAMPLE 2 A ball-nosed cylindrical end mill with 7/24 taper shank for automatic tool changers in accordance with ISO 1641-3 with recommended diameter $d_1 = 32$ and 7/24 taper no. 40 is designated as follows:

Ball-nosed cylindrical end mills ISO 1641-3 – 32 – 40 – a

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