INTERNATIONAL STANDARD

ISO 240

Second edition
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Milling cutters — Interchangeability dimensions for cutter arbors or cutter mandrels

Fraises à métaux — Dimensions d'interchangeabilité avec les arbres porte-fraises ou les mandrins porte-fraise

Reference number
ISO 240:1994(E)

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.

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.

International Standard ISO 240 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 7, *Milling cutters and milling machine accessories*.

This second edition cancels and replaces the first edition (ISO 240:1975), which has been technically revised.

Annex A of this International Standard is for information only.

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Milling cutters — Interchangeability dimensions for cutter arbors or cutter mandrels

1 Scope

This International Standard specifies the dimensions for interchangeability between the cutter and the arbor or mandrel, i.e. the diameter of the bore and the arbor or mandrel and elements of the drive, whether by keying or tenon.

It applies to all types of milling cutters mounted on cutter arbors or mandrels.

Two groups of tables have been established, relating respectively to the key drive and the tenon drive.

Tables giving the conversion of the metric values into inches are given in annex A.

2 Key drive

See figure 1 and table 1.

3 Tenon drive

See figure 2 and table 2.

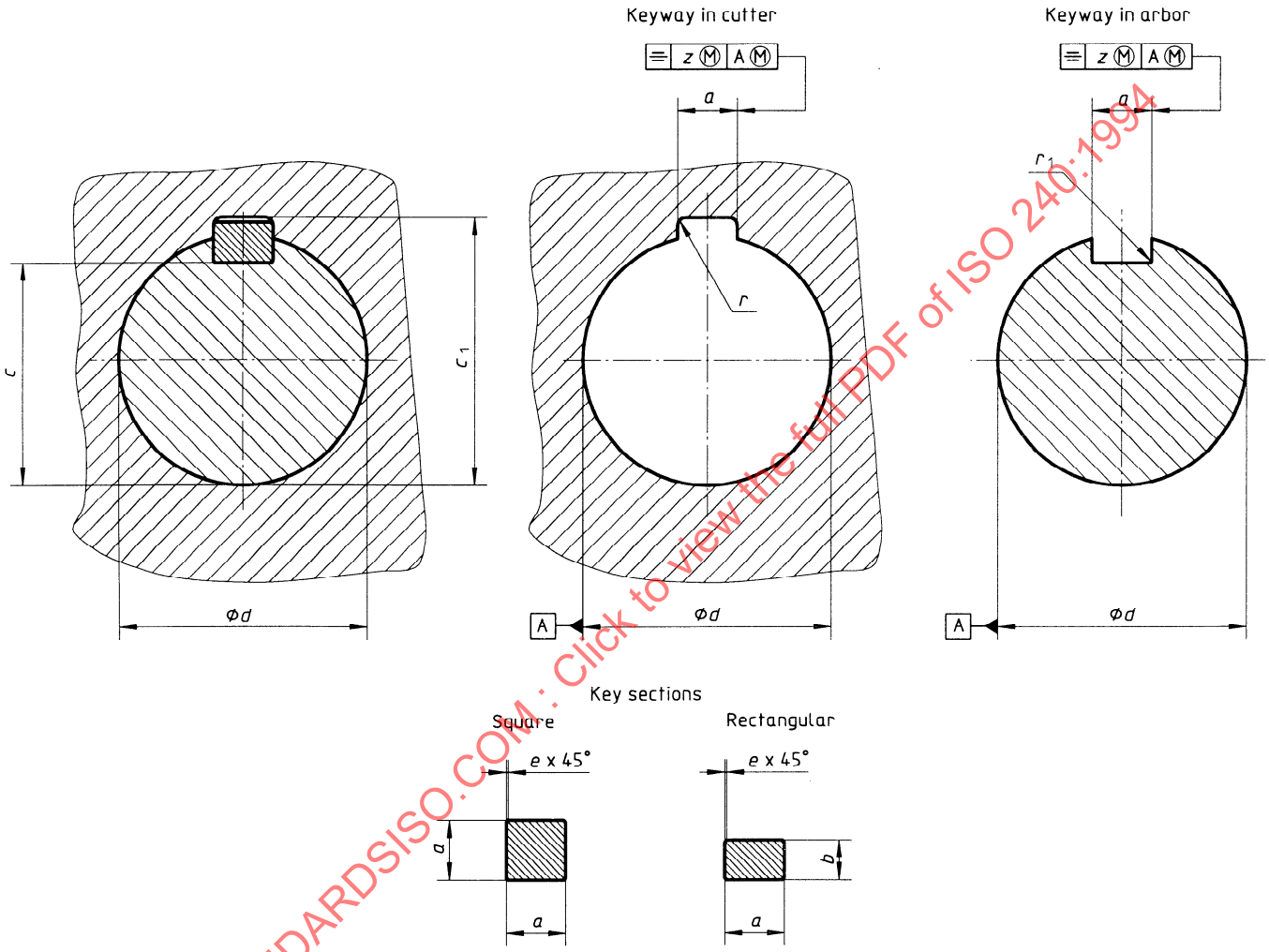

Figure 1

Table 1

Dimensions in millimetres

d 1)	a 1)	b h11	c nom.	c tol.	c_1 nom.	c_1 tol.	e nom.	e tol.	r nom.	r tol.	r_1 nom.	r_1 tol.	z
8	2		6,7		8,9								
10	3		8,2		11,5				0,4	$^{0}_{-0,1}$			0,03
13	3		11,2		14,6		0,16	$^{+0,09}_{0}$			0,16	$^{0}_{-0,08}$	
16	4		13,2	$^{0}_{-0,1}$	17,7	$^{+0,1}_{0}$			0,6	$^{0}_{-0,2}$			0,035
19	5		15,6		21,1				1				
22	6		17,6		24,1								
27	7		22		29,8		0,25	$^{+0,15}_{0}$		$^{0}_{-0,3}$	0,25	$^{0}_{-0,09}$	0,04
32	8	7	27		34,8				1,2				
40	10	8	34,5		43,5								
50	12	8	44,5		53,5				1,6				0,045
60	14	9	54	$^{0}_{-0,2}$	64,2	$^{+0,2}_{0}$	0,4	$^{+0,2}_{0}$			0,4	$^{0}_{0,15}$	
70	16	10	63,5		75				2	$^{0}_{-0,5}$			
80	18	11	73		85,5								
100	25	14	91		107		0,6		2,5		0,6	$^{0}_{-0,2}$	0,055

1) Tolerances

— on d (except for gear hobs)
  on the arbor: h6
  on the cutter: H7

— on a
  for keyway in arbor:
    free keying: H9
    close keying: N9
  for keyway in cutter: C11
  key: h9

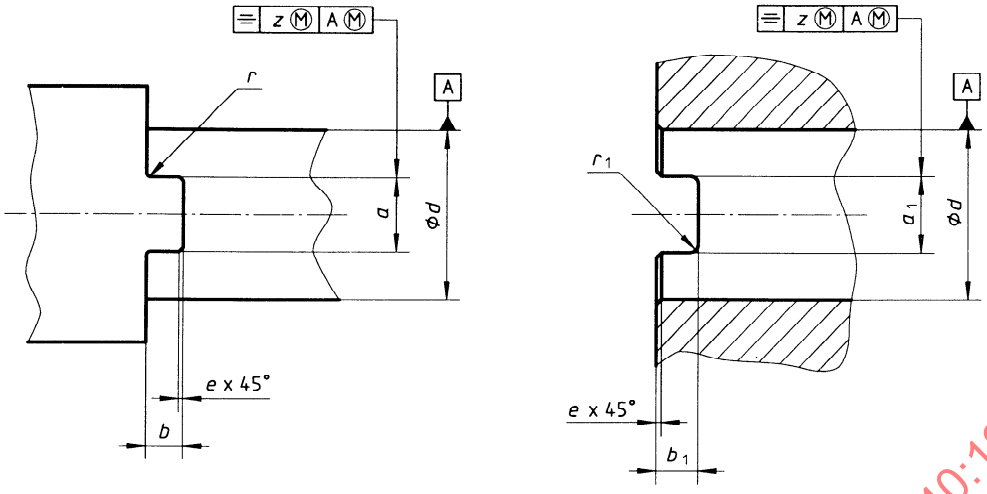

Figure 2

Table 2

Dimensions in millimetres

d 1)	Arbor			Cutter			e		z
	a h11	b h11	r max.	a_1 H11	b_1 H13	r_1 max.	nom.	tol.	
5	3	2	0,3	3,3	2,5	0,6	0,3	+0,1 0	0,15
8	5	3,5	0,4	5,4	4		0,4		
10	6	4	0,5	6,4	4,5	0,8	0,5		
13	8	4,5		8,4	5	1			
16		5			5,6		0,6	+0,2 0	0,2
19	10	5,6	0,6	10,4	6,3	1,2			
22									
27	12	6,3	0,8	12,4	7		0,8		
32	14	7		14,4	8	1,6			
40	16	8	1	16,4	9	2	1	+0,3 0	
50	18	9		18,4	10				
60	20	10		20,5	11,2				0,25

1) Tolerances on d (except for gear hobs)

on the arbor: h6
on the cutter: H7

Annex A
(informative)

Conversion from metric series to inches

A.1 Key drive

See figure 1 and table A.1.

Table A.1

Dimensions en inches

Designation	d 1)	a 1)	b 1)	c nom.	c tol.	c_1 nom.	c_1 tol.	e nom.	e tol.	r nom.	r tol.	r_1 nom.	r_1 tol.	z
8	0,314 9	0,079		0,264		0,350								
10	0,393 7	0,118		0,323		0,453				0,016	$^{0}_{-0,004}$			0,001 2
13	0,511 8	0,118		0,441		0,575		0,006	$^{+0,004}_{0}$			0,006	$^{0}_{-0,003}$	
16	0,629 9	0,157		0,520	$^{0}_{-0,004}$	0,697	$^{+0,004}_{0}$			0,024	$^{0}_{-0,008}$			
19	0,748 0	0,197		0,614		0,831								0,001 4
22	0,866 1	0,236		0,693		0,949				0,039				
27	1,063 0	0,276		0,866		1,173		0,010	$^{+0,006}_{0}$		$^{0}_{-0,012}$	0,010	$^{0}_{-0,004}$	
32	1,259 8	0,315	0,276	1,063		1,370				0,047				0,001 6
40	1,574 8	0,394	0,315	1,358		1,713								
50	1,968 5	0,472	0,315	1,752		2,106				0,063				
60	2,362 2	0,551	0,354	2,126	$^{0}_{-0,008}$	2,528	$^{+0,008}_{0}$	0,016	$^{+0,008}_{0}$			0,016	$^{0}_{-0,006}$	0,001 8
70	2,755 9	0,630	0,394	2,500		2,953				0,079	$^{0}_{-0,020}$			
80	3,149 6	0,709	0,433	2,874		3,366								
100	3,937 0	0,984	0,551	3,583		4,213		0,024		0,098		0,024	$^{0}_{-0,008}$	0,002 2

1) Tolerances: direct conversion into inches of the metric values of the tolerances h6, h9, h11, H7, H9, N9 and C11.

A.2 Tenon drive

See figure 2 and table A.2.

Table A.2

Dimensions in inches

Designation	d 1)	Arbor			Cutter			e		z
		a 1)	b 1)	r max.	a_1 1)	b_1 1)	r_1 max.	nom.	tol.	
5	0,196 8	0,118	0,079	0,012	0,130	0,099	0,020	0,012	+0,004 0	0,006
8	0,314 9	0,197	0,138	0,016	0,213	0,158		0,016		0,008
10	0,393 7	0,236	0,157	0,020	0,252	0,177	0,030	0,020		
13	0,511 8	0,315	0,177		0,331	0,197	0,040			
16	0,629 9		0,197	0,024		0,220		0,024	+0,008 0	
19	0,748 0	0,394	0,220		0,410	0,248	0,050			
22	0,866 1									
27	1,063 0	0,472	0,248	0,031	0,488	0,276		0,031		
32	1,259 8	0,551	0,276		0,567	0,316	0,060			
40	1,574 8	0,630	0,315	0,039	0,646	0,355	0,080	0,039	+0,012 0	
50	1,968 5	0,709	0,354		0,725	0,394				
60	2,362 2	0,787	0,394		0,807	0,441				0,01

1) Tolerances: direct conversion into inches of the metric values of the tolerances h6, h11, H7, H11 and H13.

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