INTERNATIONAL STANDARD ISO 3117

Tangential keys and keyways

Clavetage par clavettes tangentielles

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3117 was developed by Technical Committee ISO/TC 14, *Shafts for machinery and accessories*, and was circulated to the member bodies in June 1976.

It has been approved by the member bodies of the following countries :

Belgium	Germany	Poland
Brazil	Hungary	Romania
Canada	India	South Africa, Rep. of
Czechoslovakia	Italy	Spain
Denmark	Japan	Switzerland
Finland	Korea, Rep. of	United Kingdom
France	Mexico	U.S.S.R.

No member body expressed disapproval of the document.

Tangential keys and keyways

1 SCOPE

This International Standard specifies the dimensional characteristics of tangential keys and of their corresponding keyways in shaft and hub. It also gives the relation to be observed between the diameter of the shaft and the section of the key.

2 FIELD OF APPLICATION

This International Standard is intended for general application to cylindrical shafts.

3 DIMENSIONS AND TOLERANCES OF KEYS AND KEYWAYS

See the figure and the table on pages 2 and 3.

4 MATERIAL

Steel having a tensile strength of not less than 590 N/mm^2 in the finished condition, unless otherwise agreed between the interested parties.

NOTE — The mechanical properties of the steel will be specified completely at a later date.
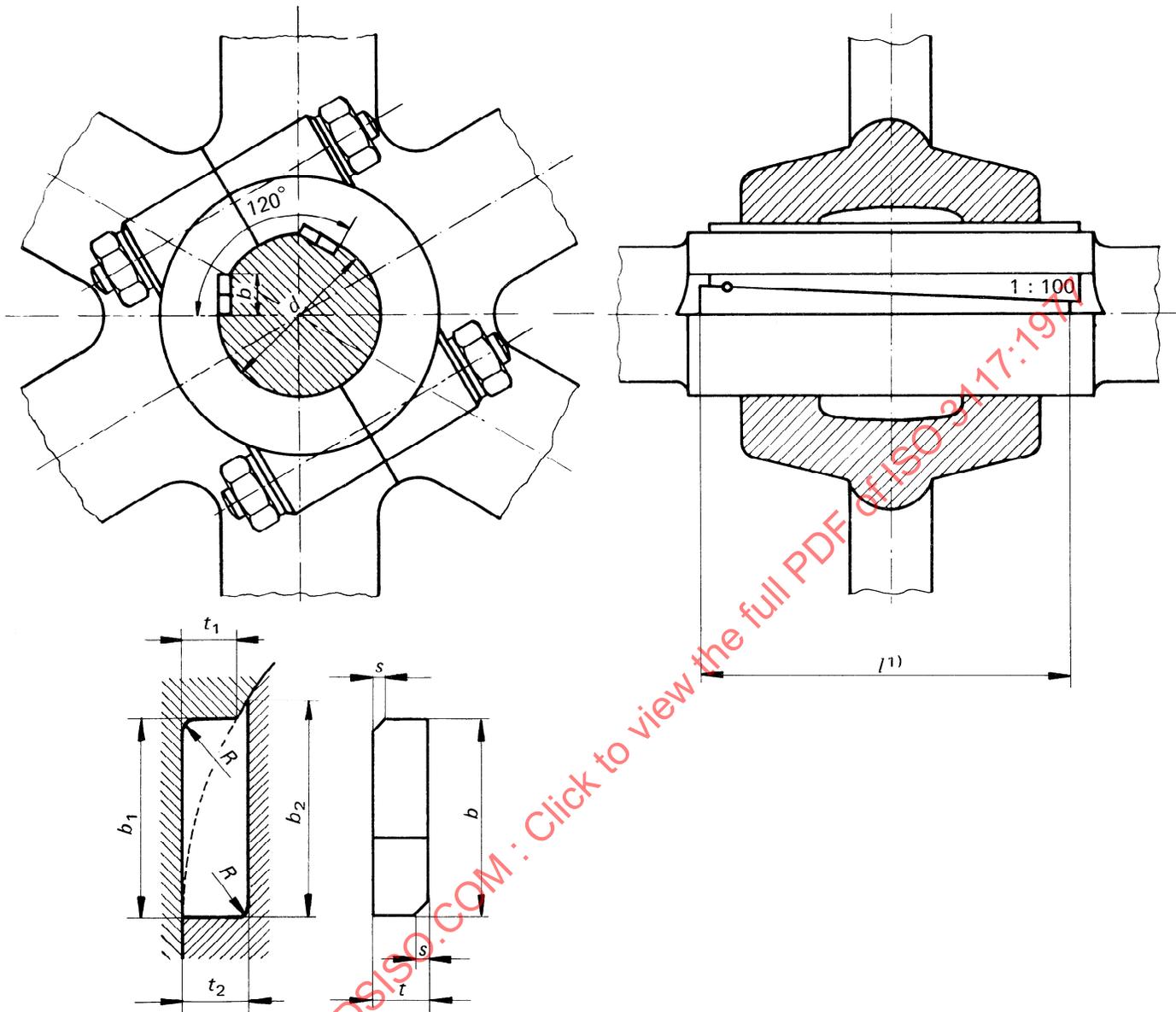
5 DESIGNATION

A pair of tangential keys shall be designated by their common thickness, their combined width and their common length and by reference to this International Standard.

Example :

— for a pair of tangential keys with thickness $t = 8$ mm, width $b = 24$ mm and length $l = 100$ mm :

key ISO 3117 — 8 × 24 × 100

1

NOTES

1 The relative positions of the keys after assembly shall be made secure by dowelling or some other suitable means.

2 To facilitate the cutting of keyways on the shaft and in the hub, they may be located 180° apart, by agreement between the interested parties.

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1) The length l is a function of the design in question; its value must always be indicated. It is recommended that this length be chosen so as to be 10 to 15 % greater than the length of the hub.

Dimensions in millimetres

Shaft diameter d 1)	KEY					KEYWAY							
	Thickness t		Calculated width b 2)	Chamfer s		Depth				Calculated width		Radius R	
						in the hub t₁		in the shaft t₂		in the hub b₁ 3)	in the shaft b₂ 4)		
	nominal	tolerance h11		min.	max.	nominal	tolerance	nominal	tolerance			max.	min.
60	7		19,3	0,6	0,8	7		7,3		19,3	19,6	0,6	0,4
63	7		19,8	0,6	0,8	7		7,3		19,8	20,2	0,6	0,4
65	7		20,1	0,6	0,8	7		7,3		20,1	20,5	0,6	0,4
70	7		21,0	0,6	0,8	7		7,3		21,0	21,4	0,6	0,4
71	8		22,5	0,6	0,8	8		8,3		22,5	22,8	0,6	0,4
75	8		23,2	0,6	0,8	8		8,3		23,2	23,5	0,6	0,4
80	8		24,0	0,6	0,8	8		8,3		24,0	24,4	0,6	0,4
85	8	0 −0,090	24,8	0,6	0,8	8		8,3		24,8	25,2	0,6	0,4
90	8		25,6	0,6	0,8	8	0 −0,2	8,3	+0,2 0	25,6	26,0	0,6	0,4
95	9		27,8	0,6	0,8	9		9,3		27,8	28,2	0,6	0,4
100	9		28,6	0,6	0,8	9		9,3		28,6	29,0	0,6	0,4
110	9		30,1	0,6	0,8	9		9,3		30,1	30,6	0,6	0,4
120	10		33,2	1,0	1,2	10		10,3		33,2	33,6	1,0	0,7
125	10		33,9	1,0	1,2	10		10,3		33,9	34,4	1,0	0,7
130	10		34,6	1,0	1,2	10		10,3		34,6	35,1	1,0	0,7
140	11		37,7	1,0	1,2	11		11,4		37,7	38,3	1,0	0,7
150	11		39,1	1,0	1,2	11		11,4		39,1	39,7	1,0	0,7
160	12		42,1	1,0	1,2	12		12,4		42,1	42,8	1,0	0,7
170	12		43,5	1,0	1,2	12		12,4		43,5	44,2	1,0	0,7
180	12		44,9	1,0	1,2	12		12,4		44,9	45,6	1,0	0,7
190	14	0 −0,110	49,6	1,0	1,2	14		14,4		49,6	50,3	1,0	0,7
200	14		51,0	1,0	1,2	14		14,4		51,0	51,7	1,0	0,7
220	16		57,1	1,6	2,0	16		16,4		57,1	57,8	1,6	1,2
240	16		59,9	1,6	2,0	16		16,4		59,9	60,6	1,6	1,2
250	18		64,6	1,6	2,0	18		18,4		64,6	65,3	1,6	1,2
260	18		66,0	1,6	2,0	18		18,4		66,0	66,7	1,6	1,2
280	20		72,1	2,5	3,0	20		20,4		72,1	72,8	2,5	2,0
300	20		74,8	2,5	3,0	20		20,4		74,8	75,5	2,5	2,0
320	22		81,0	2,5	3,0	22		22,4		81,0	81,6	2,5	2,0
340	22		83,6	2,5	3,0	22	0 −0,3	22,4	+0,3 0	83,6	84,3	2,5	2,0
360	26		93,2	2,5	3,0	26		26,4		93,2	93,8	2,5	2,0
380	26	0 −0,130	95,9	2,5	3,0	26		26,4		95,9	96,6	2,5	2,0
400	26		98,6	2,5	3,0	26		26,4		98,6	99,3	2,5	2,0
420	30		108,2	3,0	4,0	30		30,4		108,2	108,8	3,0	2,5
440	30		110,9	3,0	4,0	30		30,4		110,9	111,6	3,0	2,5
450	30		112,3	3,0	4,0	30		30,4		112,3	112,9	3,0	2,5
460	30		113,6	3,0	4,0	30		30,4		113,6	114,3	3,0	2,5
480	34		123,1	3,0	4,0	34		34,4		123,1	123,8	3,0	2,5
500	34		125,9	3,0	4,0	34		34,4		125,9	126,6	3,0	2,5
530	38	0 −0,160	136,7	3,0	4,0	38		38,4		136,7	137,4	3,0	2,5
560	38		140,8	3,0	4,0	38		38,4		140,8	141,5	3,0	2,5
600	42		153,1	3,0	4,0	42		42,4		153,1	153,8	3,0	2,5
630	42		157,1	3,0	4,0	42		42,4		157,1	157,8	3,0	2,5

See notes on page 4.

1) For intermediate shaft diameters, the dimensions of keys and keyways given for the diameter immediately above should be adopted. For shaft diameters greater than 630 mm, the dimensions of the keys and the keyways should be determined as follows :

$t = 0,068\,d$ (round off the calculated value to the next lower millimetre)

$b = \sqrt{t \times (d - t)}$

$t_1 = t$

$t_2 = t + 0,4$ mm (for $t \leqslant 45$ mm)

$\quad = t + 0,5$ mm (for $t > 45$ mm)

$b_1 = b = \sqrt{t \times (d - t)}$

$b_2 = \sqrt{t_2 \times (d - t_2)}$

$\left.\begin{array}{c} s \\ R \end{array}\right\}$ according to the table of the adjacent "note".

2) The width b is a function of the widths b_1 and b_2 of the milled keyways, respectively in the hub and in the shaft. Its theoretical value is equal to $\sqrt{t \times (d - t)}$.

3) The width b_1 is a function of the milled depth t_1. Its value has been calculated on the basis of the formula $b_1 = b = \sqrt{t \times (d - t)}$. This calculated value is both the nominal and maximum value of the width of the keyway in the hub.

4) The width b_2 is a function of the milled depth t_2. Its value has been calculated on the basis of the formula $b_2 = \sqrt{t_2 \times (d - t_2)}$. This calculated value is both the nominal and minimum value of the width of the keyway in the shaft.

NOTE — When the drive is subject to particularly severe shocks or when changes in the direction of rotation are relatively frequent it is recommended to use a key of larger than specified section whose dimensions will be calculated from the following data :

$t = 0,1\,d$

$t_1 = t$

$b = \sqrt{t \times (d - t)} = 0,3\,d$

$t_2 = t + 0,3$ mm (for $t \leqslant 10$ mm)

$\quad = t + 0,4$ mm (for 10 mm $< t \leqslant 45$ mm)

$\quad = t + 0,5$ mm (for $t > 45$ mm)

$b_1 = b = \sqrt{t \times (d - t)} = 0,3\,d$

$b_2 = \sqrt{t_2 \times (d - t_2)}$

$\left.\begin{array}{c} s \\ R \end{array}\right\}$ according to the table below :

Dimensions in millimetres

for t		s		R	
above	up to	min.	max.	max.	min.
—	9	0,6	0,8	0,6	0,4
9	14	1,0	1,2	1,0	0,7
14	18	1,6	2,0	1,6	1,2
18	26	2,5	3,0	2,5	2,0
26	42	3,0	4,0	3,0	2,5
42	56	4,0	5,0	4,0	3,0
56	63	5,0	6,0	5,0	4,0