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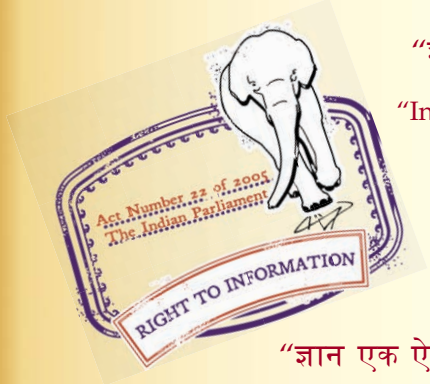
IS 2291 (1990): Tangential keys and keyways [PGD 31: Bolts, Nuts and Fasteners Accessories]



"ज्ञान से एक नये भारत का निर्माण"
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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 2291 : 1990
ISO 3117 : 1977
(Reaffirmed 2006)

Indian Standard

TANGENTIAL KEYS AND KEYWAYS

(Third Revision)

UDC 621·886·6

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1991

Price Group 3

Indian Standard

TANGENTIAL KEYS AND KEYWAYS

(Third Revision)

NATIONAL FOREWORD

This Indian Standard (Third Revision), which is identical with ISO 3117 : 1977 'Tangential keys and keyways' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on 2 February 1990 on the recommendation of the Transmission Devices Sectional Committee (LMD 10) and approval of the Light Mechanical Engineering Division Council.

This standard was first published in 1963 and revised in 1976 and 1981. This third revision has now been aligned with ISO 3117 : 1977 in order to follow the international practices.

The text of the ISO standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

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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.

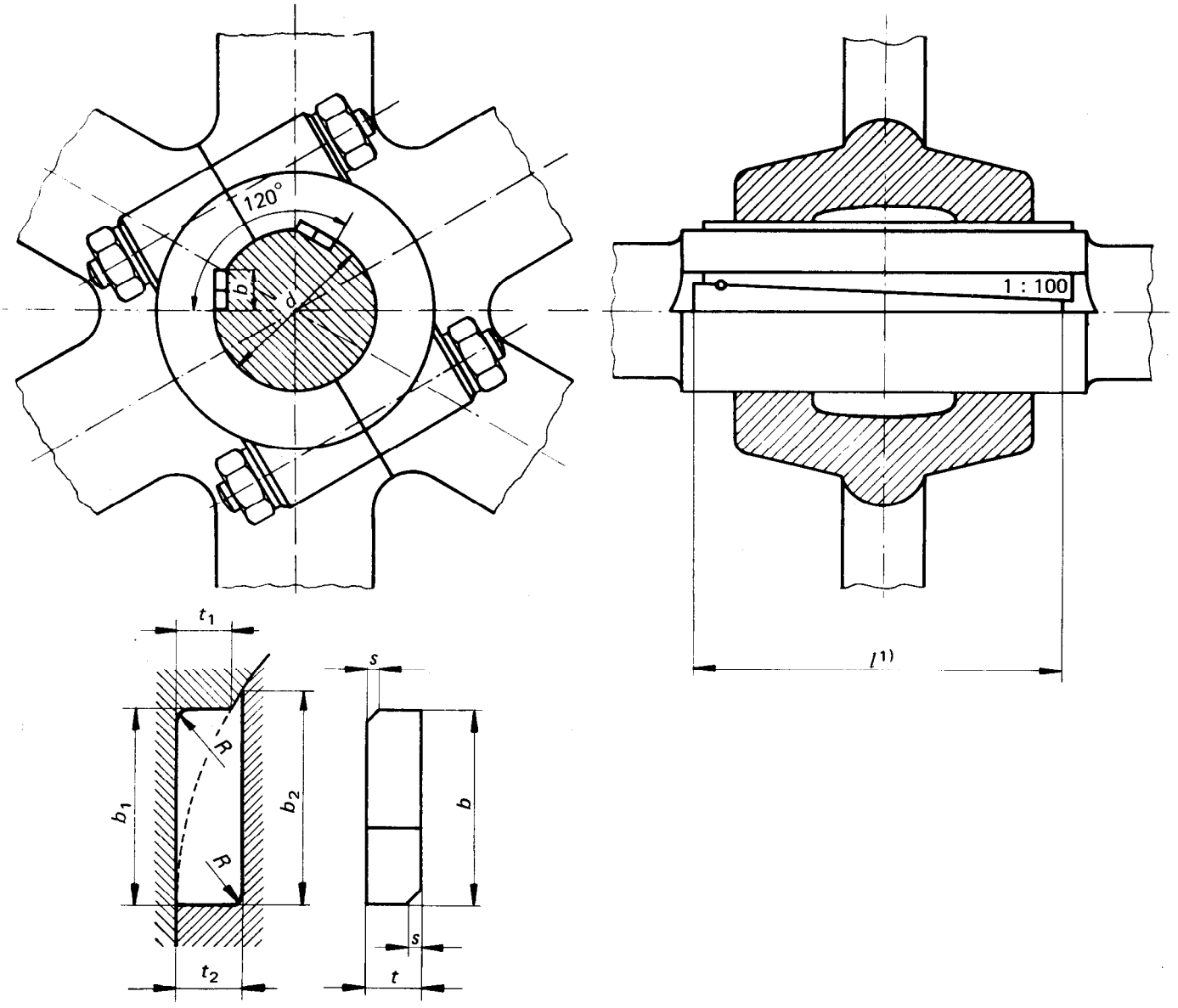
5 DESIGNATION

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



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.

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 t_1		in the shaft t_2		in the hub b_1 3)	in the shaft b_2 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	136,7	3,0	4,0	38		38,4		136,7	137,4	3,0	2,5
560	38	−0,160	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)

$= t + 0{,}5$ mm (for $t > 45$ mm)

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

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

$\left.\begin{matrix} s \\ R \end{matrix}\right\}$ 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)

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

$= t + 0{,}5$ mm (for $t > 45$ mm)

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

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

$\left.\begin{matrix} s \\ R \end{matrix}\right\}$ 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

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