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Plain bearings — Lubrication holes, grooves and pockets — Dimensions, types, designation and their application to bearing bushes

*Paliers lisses — Trous, rainures et poches de graissage — Dimensions,
types, désignation et leurs applications dans les bagues*



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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12128 was prepared by Technical Committee ISO/TC 123, *Plain bearings*, Subcommittee SC 3, *Dimensions, tolerances and construction details*.

This second edition cancels and replaces the first edition (ISO 12128:1995), which has been technically revised.

Plain bearings — Lubrication holes, grooves and pockets — Dimensions, types, designation and their application to bearing bushes

1 Scope

This International Standard specifies dimensions for lubrication holes, grooves and pockets for bearing bushes. These dimensions can be entered, e.g. on drawings, using the designation examples. Their use depends in particular on the specific operating conditions.

In addition, it enables the user to assign the different types of lubricant feed and distribution to plain bearing bushes made of copper alloys, thermosetting plastics, thermoplastics or of artificial carbon.

NOTE Different types of lubricant feed and distribution for plain bearing bushes made of sintered metals have not been specified due to the fact that these bushes are soaked with lubricant. Plain bearing bushes made of artificial carbon are not lubricated with oil or grease.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 2768-1:1989, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*.

ISO 4379:1993, *Plain bearings — Copper alloy bushes*.

3 Dimensions, types and designation

3.1 General

The dimensions of the lubrication holes, grooves and pockets are related to the bearing wall thickness s . The given diameter d_1 shall only serve as an auxiliary dimension.

All dimensions are given in millimetres.

3.2 Lubrication holes

3.2.1 Dimensions and types

See Figure 1 and Table 1.

Lubrication holes may be provided in conjunction with lubrication grooves and pockets, or, if the requirement to be met by a lubrication point is less stringent, even without these.

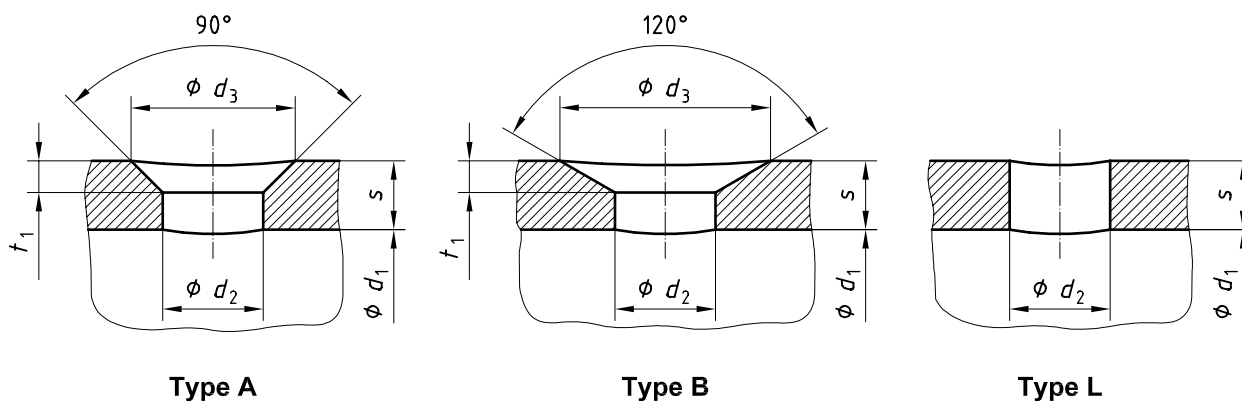


Figure 1 — Lubrication holes

Table 1 — Dimensions of the lubrication holes

d_2		2,5	3	4	5	6	8	10	12
t_1		1	1,5	2	2,5	3	4	5	6
$d_3 \approx$	Type A	4,5	6	8	10	12	16	20	24
	Type B	6	8,2	10,8	13,6	16,2	21,8	27,2	32,6
s	$>$	—	2	2,5	3	4	5	7,5	10
	\leq	2	2,5	3	4	5	7,5	10	—
d_1	nom.	$d_1 \leq 30$		$30 < d_1 > \leq 100$			$d_1 > 100$		

3.2.2 Designation

EXAMPLE A lubrication hole of type A with before diameter $d_2 = 3$ mm, is designated as follows:

Lubrication hole ISO 12128 - A3

3.3 Lubrication grooves

3.3.1 Dimensions and types

See Figures 2 and 3 and Tables 2 and 3.

Lubrication grooves are mainly provided on plain bearings. Types C, D and E are also used in conjunction with type H (circumferential groove), predominantly on plain bearings made of non-ferrous metal, steel, cast iron or plastics, types F and G predominantly on plain bearings made from artificial carbon.

Type J is a narrow blended groove principally for use with grease lubrication. In order to facilitate machining and avoid burrs, all sharp corners may have a small break edge or radius.

NOTE In order to facilitate manufacture, the dimension of the bearing thickness remaining at the base of the groove may be specified on the drawing as the control dimension.

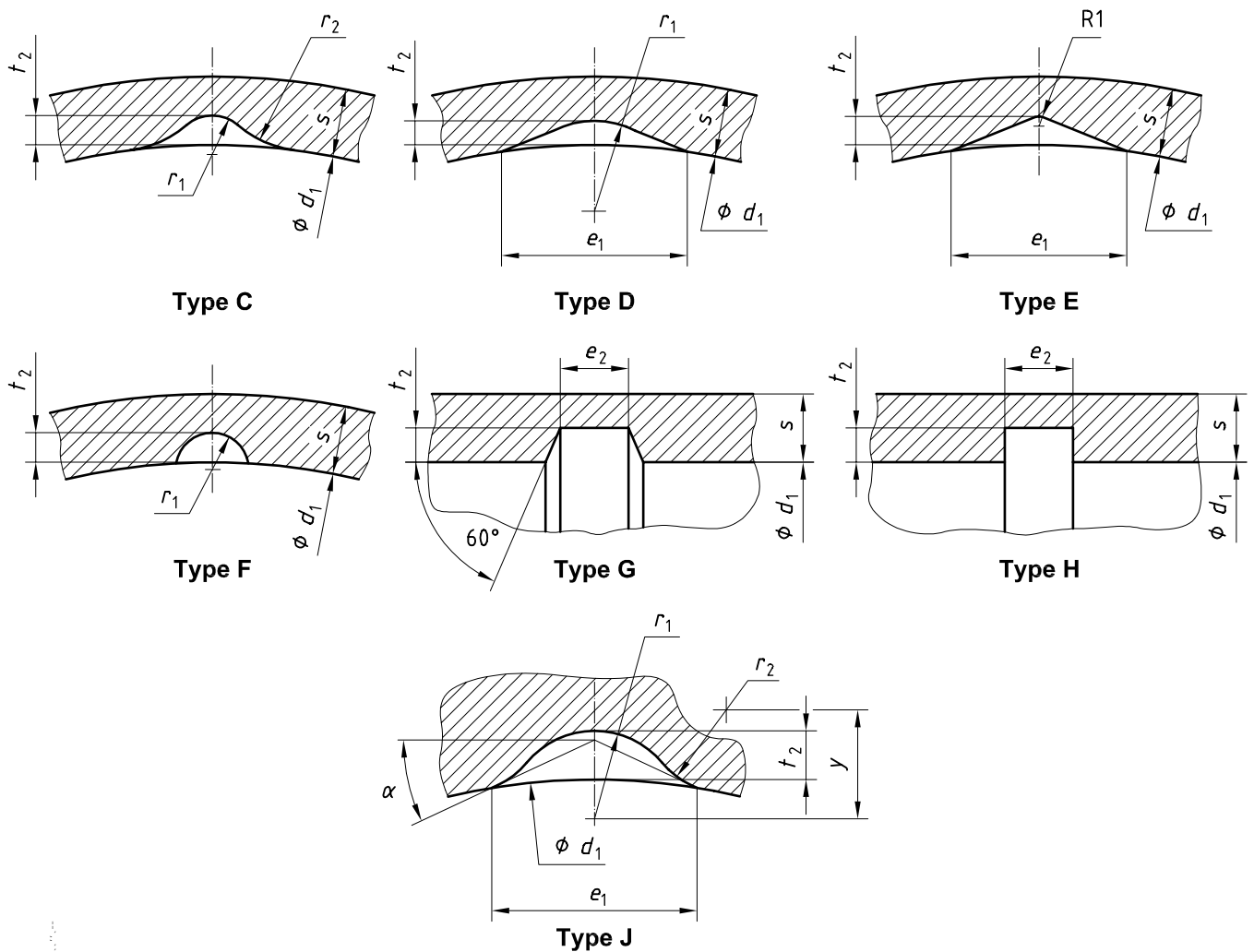
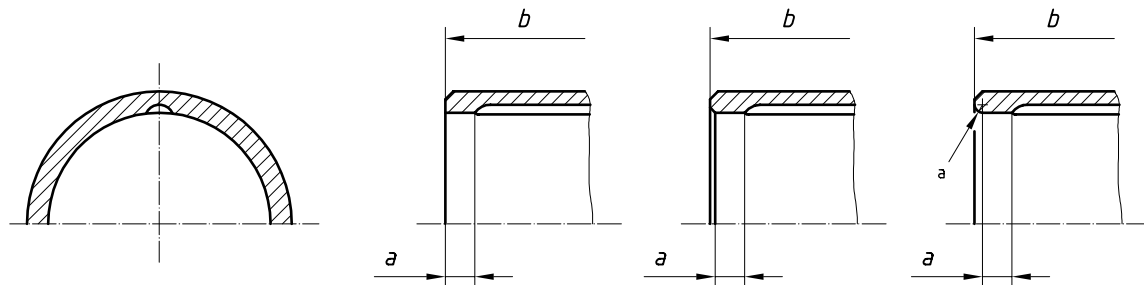


Figure 2 — Lubrication grooves

Table 2 — Dimensions of lubrication grooves

t_2 Type	e_1 Type		e_2 Type		r_1 Type				r_2 Type		y Type	α Type	s		d_1 Type	
	D, E	J	G	H	C	D	F	J	C	J	J	J	>	\leq	C to H	J
0,4	3	3	1,2	3	1,5	1,5	1	1	1,5	1	1,5	28°	—	1	$d_1 \leq 30$	16
0,6	4	4	1,6	3	1,5	1,5	1	1,5	2	1,5	2,1	25°	1	1,5		20
0,8	5	5	1,8	3	1,5	2,5	1	1,5	3	1,5	2,2	25°	1,5	2		30
1	8	6	2	4	2	4	1,5	2	4,5	2	2,8	22°	2	2,5		40
1,2	10,5	6	2,5	5	2,5	6	2	2	6	2	2,6	22°	2,5	3	$d_1 \leq 100$	40
1,6	14	7	3,5	6	3	8	3	2,5	9	2,5	3	20°	3	4		50
2	19	8	4,5	8	4	12	4	2,5	12	2,5	2,6	20°	4	5		60
2,5	28	8	7,5	10	5	20	5	3	15	3	2,8	20°	5	7,5	$d_1 > 100$	70
3,2	38	—	11	12	7	28	7	—	21	—	—	—	7,5	10		—
4	49	—	14	15	9	35	9	—	27	—	—	—	10	—		—



^a Rounded

Figure 3 — Lubrication grooves with closed ends

Table 3 — Dimensions for distance a

b	nom.	$15 \leq b \leq 30$	$30 < b \leq 60$	$60 < b \leq 100$	$b > 100$
a		3	4	6	10

3.3.2 Designation

EXAMPLE A lubrication groove of type D with groove depth $t_2 = 0,8$ mm, is designated as follows:

Lubrication groove ISO 12128 - D0,8

3.4 Lubrication pockets

3.4.1 Dimensions and types

See Figure 4 and Table 4.

Lubrication pockets shall in general be provided in cases where larger lubrication spaces are required. Type K shall predominantly be used for plain slideways with a to-and-fro movement in a straight line.

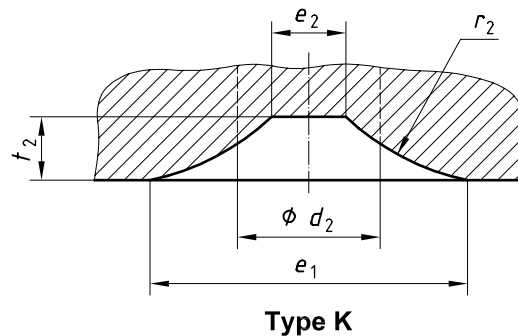


Figure 4 — Lubrication pocket

Table 4 — Dimensions of the lubrication pockets

t_2	d_2	e_1	e_2	r_2
1,6	6	8	1,8	6,5
2,5	8	15	2,8	14
4	10	24	4,5	20
6	12	35	6,3	30

3.4.2 Designation

EXAMPLE A lubrication pocket of type K with pocket depth $t_2 = 2,5$ mm, is designated as follows:

Lubrication pocket ISO 12128 - K2,5

3.5 Design

Permissible deviations without tolerance indications shall be in accordance with tolerance class “c” specified in ISO 2768-1. The edges shall be chamfered to 0,5 max. or rounded. Sharp-edged transitions to the sliding surface shall be avoided.

Lubrication holes, grooves and pockets should not be arranged in the stressed zone of the plain bearing. With the exception of plain bearings made from artificial carbon, lubrication grooves and pockets shall in general not be made over the whole length of the bearing. The shape of the groove or pocket runout shall be left to the manufacturer's discretion.

NOTE When producing lubrication grooves and pockets in plain bearings from tough and hard materials, chatter marks may occur on the bottom of the groove, which do not impair the operation of the plain bearing. Lubrication holes, grooves and pockets are not provided on plain bearings made from sintered metal, since these are soaked with lubricant.

4 Lubrication holes, grooves and pockets on bearing bushes (see Table 5)

The dimensions and types of the lubrication holes, grooves and pockets on bearing bushes in accordance with this International Standard are given in 3.2 to 3.4.

Examples for the designation of bearing bushes without lubrication holes, grooves and pockets are to be taken from the relevant standards on dimensions.

The symbol x represents, in the ISO designation, the required distance from the insert side, unless $x = b/2$; the symbol h represents the required dimension for the groove pitch, which is from $0,1b$ up to $1b$.

If two lubrication holes and grooves are provided, they shall be located at 180° to each other, if there are three at 120° and four at 90° to each other.

Only one type and one bush form are illustrated and designated, each with freely chosen values for the dimensions x and h .

5 Examples of the designation of bushes with lubrication holes and/or grooves

Bush C 20 × 24 × 20 Y made of CuSn8P accordance with ISO 4379, with two lubrication holes of type L (2L) corresponding to bush A of this International Standard, off-centre, with distance $x = 6$ mm is designated as follows.

Bush ISO 4379 - C 20 x 24 x 20 Y - A2L6 - CuSn8P

Same bush but with two longitudinal grooves of type D (2D) corresponding to bush type C of this International Standard is designated as follows.

Bush ISO 4379 - C 20 x 24 x 20 Y - A2L62D - CuSn8P

Bush C 20 × 24 × 20 Y made of CuSn8P accordance with ISO 4379, with three longitudinal grooves of type D (3D) corresponding to bush type C of this International Standard, in conjunction with one circumferential groove of type H (1H) corresponding to bush of type E of this International Standard, off-centre, with distance $x = 6$ mm is designated as follows.

Bush ISO 4379 - C 20 x 24 x 20 Y - C3DE1H6 - CuSn8P

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Table 5 — Types of bearing bush

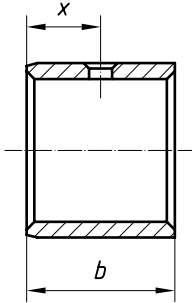
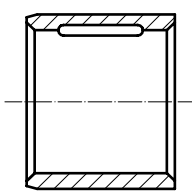
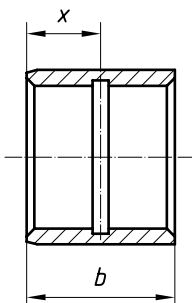
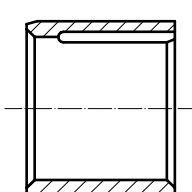
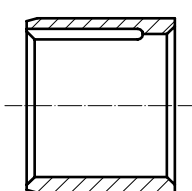
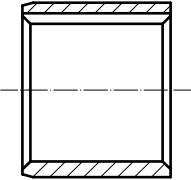
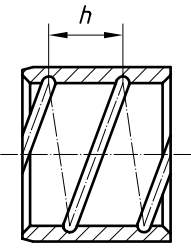
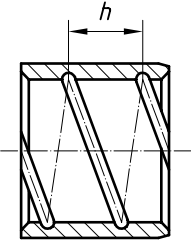
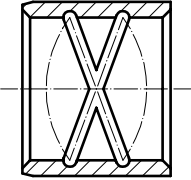
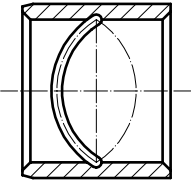
Bush type	Lubrication holes and grooves		Bearing bush material
	Type accordance with clause 3	Type and application	
A	A B L	Lubrication hole, in-centre or off-centre	 <p>Copper alloys Thermosetting plastics Thermoplastics</p>
C	C D E J	Longitudinal groove closed at both ends	 <p>Copper alloys Thermosetting plastics Thermoplastics</p>
E	G H	Circumferential groove, in-centre or off-centre	 <p>Copper alloys Thermosetting plastics Thermoplastics Artificial carbon</p>
G	C D E J	Longitudinal groove open at the end opposite the insert side	 <p>Copper alloys Thermosetting plastics Thermoplastics</p>
H	C D E J	Longitudinal groove open at the end towards the insert side	 <p>Copper alloys Thermosetting plastics Thermoplastics</p>

Table 5 — Types of bearing bush (continued)

Bush type	Type accordance with clause 3	Lubrication holes and grooves		Bearing bush material
		Type and application		
J	C D E F J	Longitudinal groove open at both ends		Copper alloys Artificial carbon
K	C F J	Helical groove, right-hand thread		Copper alloys Artificial carbon
L	C F J	Helical groove, left-hand thread		Copper alloys Artificial carbon
M	C J	Octagonal groove		Copper alloys Thermosetting plastics Thermoplastics
N	C J	Oval groove		Copper alloys Thermosetting plastics Thermoplastics

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