
**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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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 12128:2001), which has been technically revised. The main changes to the previous edition are as follows:

- dimension units added to tables;
- Bibliography added and ISO 4379 and ISO 4383 moved from [Clause 2](#) to the Bibliography;
- references corrected.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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

1 Scope

This document specifies dimensions for lubrication holes, grooves and pockets for bearing bushes. These dimensions can be entered, for example 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 solid and steel-backed plain bearing bushes made of copper alloys, aluminium alloys, thermosetting plastics, thermoplastics or 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Dimensions, types and designation

4.1 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.

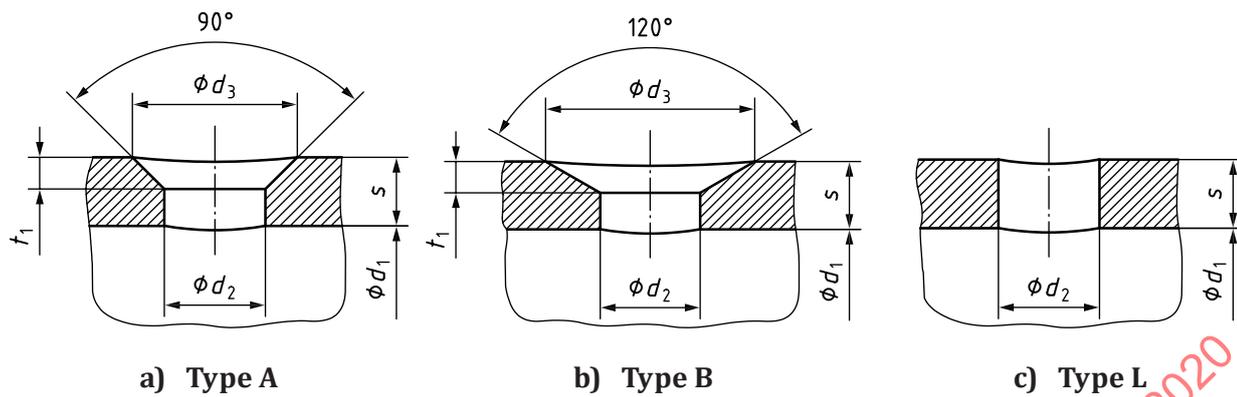
4.2 Lubrication holes

4.2.1 Dimensions and types

Dimensions and types of lubrication holes shall be in accordance with [Figure 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.

Dimensions in mm



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	6,0	8,2	10,9	13,7	16,4	21,9	27,3	32,8
s	>	—	2	2,5	3	4	5	7,5	10
	\leq	2	2,5	3	4	5	7,5	10	—
d_1	nom.	$d_1 \leq 30$		$30 < d_1 \leq 100$			$d_1 > 100$		

Figure 1 — Lubrication holes

4.2.2 Designation

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

Lubrication hole ISO 12128 - A3

4.3 Lubrication grooves

4.3.1 Dimensions and types

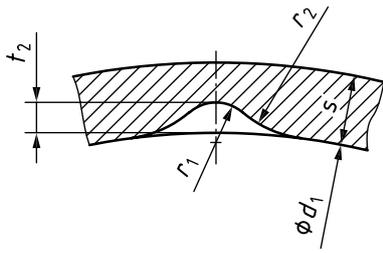
Dimensions and types of lubrication grooves shall be in accordance with Figure 2. Dimensions and types of lubrication grooves with closed ends shall be in accordance with Figure 3.

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, aluminium alloys or copper alloys.

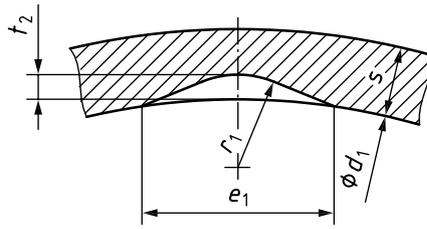
Type J is a narrow blended groove principally for use with grease lubrication.

In order to facilitate machining and avoid burrs, all sharp corners should have a small chamfer or radius.

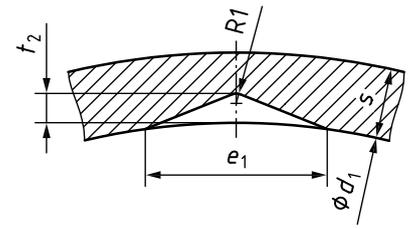
In order to facilitate manufacture, the dimension of the bearing thickness remaining at the base of the groove may be specified on the drawing as the control dimension.



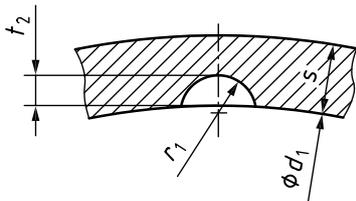
a) Type C



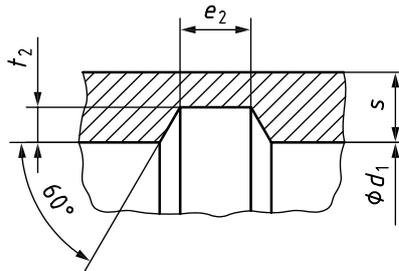
b) Type D



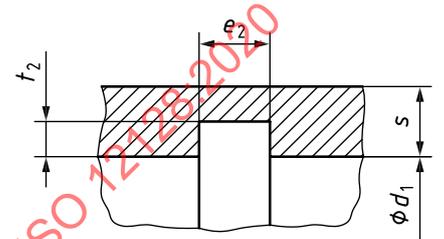
c) Type E



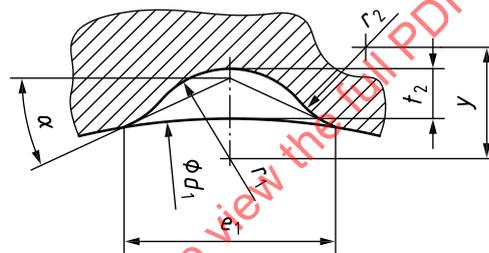
d) Type F



e) Type G



f) Type H

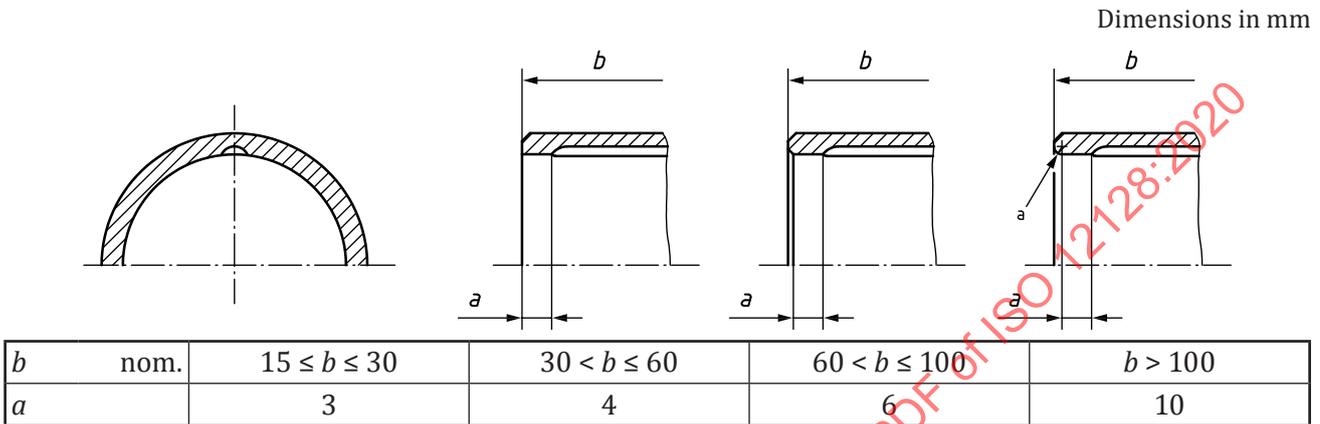


g) Type J

t_2 mm	e_1 mm		e_2 mm		r_1 mm				r_2 mm		y mm	α °	s mm		d_1 mm	
Type	Type		Type		Type				Type		Type	Type			Type	
C to J	D, E	J	G	H	C	D	F	J	C	J	J	J	>	≤	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	26	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	—		—

Figure 2 — Lubrication grooves



^a Rounded.

Figure 3 — Lubrication grooves with closed ends

4.3.2 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

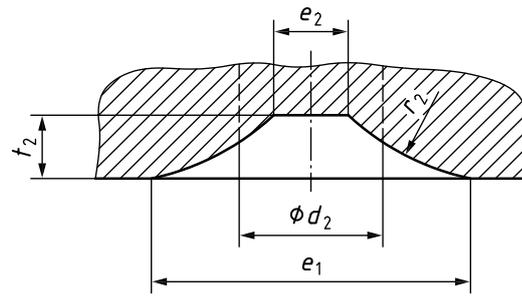
4.4 Lubrication pockets

4.4.1 Dimensions and types

Dimensions and types of lubrication pockets shall be in accordance with [Figure 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.

Dimensions in mm



Type K

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

Figure 4 — Lubrication pockets

4.4.2 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

4.5 Design

Permissible deviations without tolerance indications shall be in accordance with tolerance class “c” as 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 can occur on the bottom of the groove, which do not impair the operation of the plain bearing. Lubrication holes, grooves and pockets are not typically provided on plain bearings made from sintered metal, if they are soaked with lubricant.

5 Lubrication holes, grooves and pockets on bearing bushes

Types of bearing bushes with lubrication holes and grooves are shown in [Table 1](#).

The dimensions and types of the lubrication holes, grooves and pockets on bearing bushes in accordance with this document are given in [4.2](#) to [4.4](#).

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 three are provided they shall be at 120° to each other and if four are provided they shall be at 90° to each other.

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

Table 1 — Types of bearing bushes

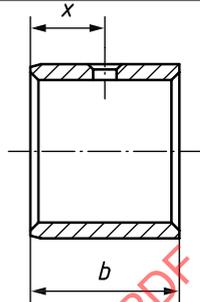
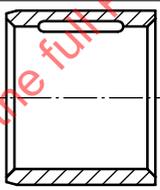
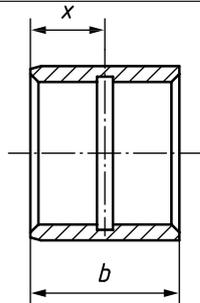
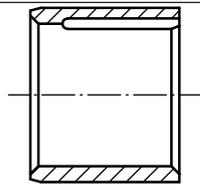
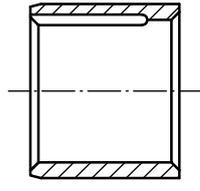
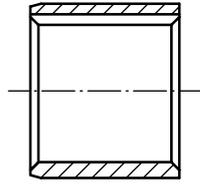
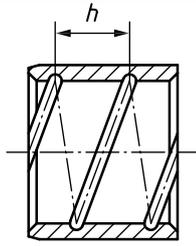
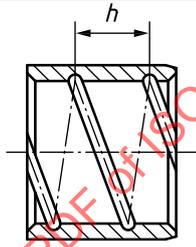
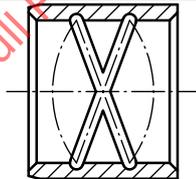
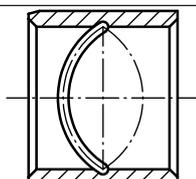
Bush type	Lubrication holes and grooves		Typical bearing bush material
	Type in accordance with Clause 4	Type and application	
A	A	Lubrication hole, in-centre or off-centre	
	B		
	L		
C	C	Longitudinal groove closed at both ends	
	D		
	E		
	J		
E	G	Circumferential groove, in-centre or off-centre	
	H		
G	C	Longitudinal groove open at the end opposite the insert side	
	D		
	E		
	J		
H	C	Longitudinal groove open at the end towards the insert side	
	D		
	E		
	J		
J	C	Longitudinal groove open at both ends	
	D		
	E		
	F		
	J		

Table 1 (continued)

Bush type	Lubrication holes and grooves		Typical bearing bush material
	Type in accordance with Clause 4	Type and application	
K	C	Helical groove, right-hand thread	
	F		
	J		
L	C	Helical groove, left-hand thread	
	F		
	J		
M	C	Octagonal groove	
	J		
N	C	Oval groove	
	J		

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

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

Bush ISO 4379 – C 20 × 24 × 20 Y – A2L6 – CuSn8P

The same bush but with two longitudinal grooves of type D (2D) corresponding to bush type C of this document is designated as follows:

Bush ISO 4379 – C 20 × 24 × 20 Y – A2L62D – CuSn8P

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

Bush ISO 4379 – C 20 × 24 × 20 Y – C3DE1H6 – CuSn8P