INTERNATIONAL STANDARD

ISO 9628

Third edition
2019-09

Rolling bearings — Insert bearings and eccentric locking collars — Geometrical product specifications (GPS) and tolerance values

Roulements — Roulements insert et bagues de blocage excentriques — Spécification géométrique des produits (GPS) et valeurs de tolérances

Contents

Page

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 4, *Rolling bearings*, Subcommittee SC 6, *Insert bearings*.

This third edition cancels and replaces the second edition (ISO 9628:2006), which has been technically revised. It also incorporates the Amendment ISO 9628:2006/Amd 1:2011.

The main changes compared to the previous edition are as follows:

— diameter series 3 has been included;

— the fractional expression "1-1/6" for 28,575 mm has been corrected to "1-1/8";

— introduction of tolerance on D to get interchangeability among bearings from different manufactures;

— the geometrical product specification (GPS) system has been applied.

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.

Introduction

This document is a machine element geometry standard as defined in the geometrical product specification (GPS) system presented in the matrix model of ISO 14638[7].

The fundamental rules of ISO/GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1[5] apply to the specifications made in accordance with this document, unless otherwise indicated.

The connection between functional requirements, measuring technique and measuring uncertainty is always intended to be considered. The traditionally used measuring technique is described in ISO 1132-2[3]. For measurement uncertainty, it is intended that ISO 14253-2[6] be considered.

Rolling bearings — Insert bearings and eccentric locking collars — Geometrical product specifications (GPS) and tolerance values

1 Scope

This document specifies the dimensional and geometrical characteristics, boundary dimensions and tolerances of insert bearings and eccentric locking collars and the radial internal clearances of insert bearings.

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 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1132-1, *Rolling bearings — Tolerances — Part 1: Terms and definitions*

ISO 5593, *Rolling bearings — Vocabulary*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 14405-1, *Geometrical product specifications (GPS) — Dimensional tolerancing — Part 1: Linear sizes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1101, ISO 1132-1, ISO 5593 and ISO 14405-1 and the following apply.

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/

3.1
insert bearing
radial rolling bearing with a spherical outside surface and an extended inner ring with a locking device

Note 1 to entry: The locking device, used for fixing the inner ring to the shaft, may be an eccentric locking collar or set screws either in a concentric locking collar around the inner ring or directly in the inner ring.

4 Symbols

ISO 8015 shall be applied and the dimensional and geometrical characteristics shall be included in the technical product documentation (for example, on the drawing). The dimensional specifications associated to these characteristics are described in Table 1.

In this document, the ISO default specification operator for size is in accordance with ISO 14405-1, i.e. the two-point size is valid.

NOTE   Figures 1 to 6 are drawn schematically and sealing devices and cages are not shown in Figures 1 to 4. A tolerance value and width of tolerance zone associated to a characteristic is symbolised by t followed by the symbol for the characteristic, for example t_{Vdsp} or t_{A1}.

Table 1 — Symbols for nominal sizes, dimension limits, characteristics and specification modifiers

Symbol for nominal dimension. (size and distance)a	Symbol for characteristica	GPS symbol and specification modifierb,c	Descriptiond	See Figure
A		min.	lower limit distance between the face and the end face of eccentric surface of inner ring	Figure 5
A_1	A1	⊕	position of the end face of eccentric surface at distance "A1" with respect to the small face of eccentric locking collar	
B			nominal width of inner ring	Figures 2 and 3
		max.	upper limit width of inner ring	
B_1			nominal width of inner ring and eccentric collar in combination	Figure 1
		max. (GN)	upper limit width of inner ring and eccentric collar in combination	
B_2			nominal width of eccentric collar	Figure 6
	ΔB2s	(GN) ALS ⟨⊟⟩	**upper limit:** deviation of a minimum circumscribed size of eccentric collar width, between two opposite lines, in any longitudinal section which includes the eccentric collar bore axis	
		(LP)	**lower limit:** deviation of a two-point size of eccentric collar width	
C			nominal width of outer ring	Figures 1, 2, 3 and 4
C_1			nominal distance from the middle plane of outer ring width to the center of lubrication zone	Figure 1
C_2			nominal width of lubrication zone	Figure 1
D			nominal outside diameter of bearing (diameter of spherical outer surface of outer ring)	Figures 1, 2, 3 and 4
	ΔDm	(LP) (SD)	deviation of a midrange size (out of two-point sizes) of spherical outer surface diameter	Figures 1, 2, 3 and 4

a	Symbols as defined in ISO 15241[8] except for the format used.
b	Symbols as defined in ISO 1101 and ISO 14405-1.
c	Specification modifier LP shall not be indicated on a drawing, if the two-point size is applied for both specified limits.
d	Description based on ISO 1101, ISO 5459[4] and ISO 14405-1.

Table 1 *(continued)*

Symbol for nominal dimension. (size and distance)[a]	Symbol for characteristic[a]	GPS symbol and specification modifier[b,c]	Description[d]	See Figure
d			nominal bore diameter of inner ring or of eccentric locking collar	Figures 1, 2, 3, 4, 5 and 6
	Δdmp	ⓛⓟ ⓢⓓ ACS	deviation of a midrange size (out of two-point sizes) of inner ring bore diameter in any cross-section	Figures 1, 2, 3 and 4
	Vdsp	ⓛⓟ ⓢⓡ ACS	range of two-point sizes of inner ring bore diameter in any cross-section	
	Δds	ⓛⓟ	deviation of a two-point size of eccentric collar bore diameter	Figure 6
*d*₁			nominal outside diameter of eccentric locking collar	Figure 6
		max.	upper limit outside diameter of eccentric locking collar	
*d*₂			nominal small bore diameter of eccentric surface (at theoretical sharp corner) of eccentric locking collar	Figure 6
	Δd2s	ⓛⓟ	deviation of a two-point size of small bore diameter of eccentric surface (at theoretical sharp corner) of eccentric locking collar	
*d*₃			nominal large outside diameter of eccentric surface (at theoretical sharp corner) of inner ring	Figure 5
		max.	upper limit large outside diameter of eccentric surface (at theoretical sharp corner) of inner ring	
H			nominal eccentricity of inner ring eccentric extension and of eccentric locking collar	Figures 5 and 6
	H	⊕	position of eccentricity of eccentric extension of inner ring or eccentric locking collar at distance *H* with respect to datum (i.e. axis established from bore surface of inner ring) or datum (i.e. axis established from bore surface of eccentric locking collar)	
*r*₁			nominal chamfer dimension of eccentric surface of inner ring	Figure 5
*r*₂			nominal fillet radius of eccentric surface of inner ring	Figure 5
*r*₃			nominal fillet radius of eccentric surface of eccentric locking collar	Figure 6
*r*₄			nominal chamfer dimension of eccentric surface of eccentric locking collar	Figure 6

[a]   Symbols as defined in ISO 15241[8] except for the format used.

[b]   Symbols as defined in ISO 1101 and ISO 14405-1.

[c]   Specification modifier LP shall not be indicated on a drawing, if the two-point size is applied for both specified limits.

[d]   Description based on ISO 1101, ISO 5459[4] and ISO 14405-1.

Table 1 *(continued)*

Symbol for nominal dimension. (size and distance)[a]	Symbol for characteristic[a]	GPS symbol and specification modifier[b,c]	Description[d]	See Figure
S			nominal distance from the middle plane of outer ring width to the face of inner ring on side opposite locking device (auxiliary dimension)	Figures 1, 2, 3 and 4
S_1			nominal distance from the middle plane of outer ring width to face of inner ring or eccentric locking collar limiting overall bearing width on locking device side	Figures 1, 2, 3 and 4

[a] Symbols as defined in ISO 15241[8] except for the format used.

[b] Symbols as defined in ISO 1101 and ISO 14405-1.

[c] Specification modifier LP shall not be indicated on a drawing, if the two-point size is applied for both specified limits.

[d] Description based on ISO 1101, ISO 5459[4] and ISO 14405-1.
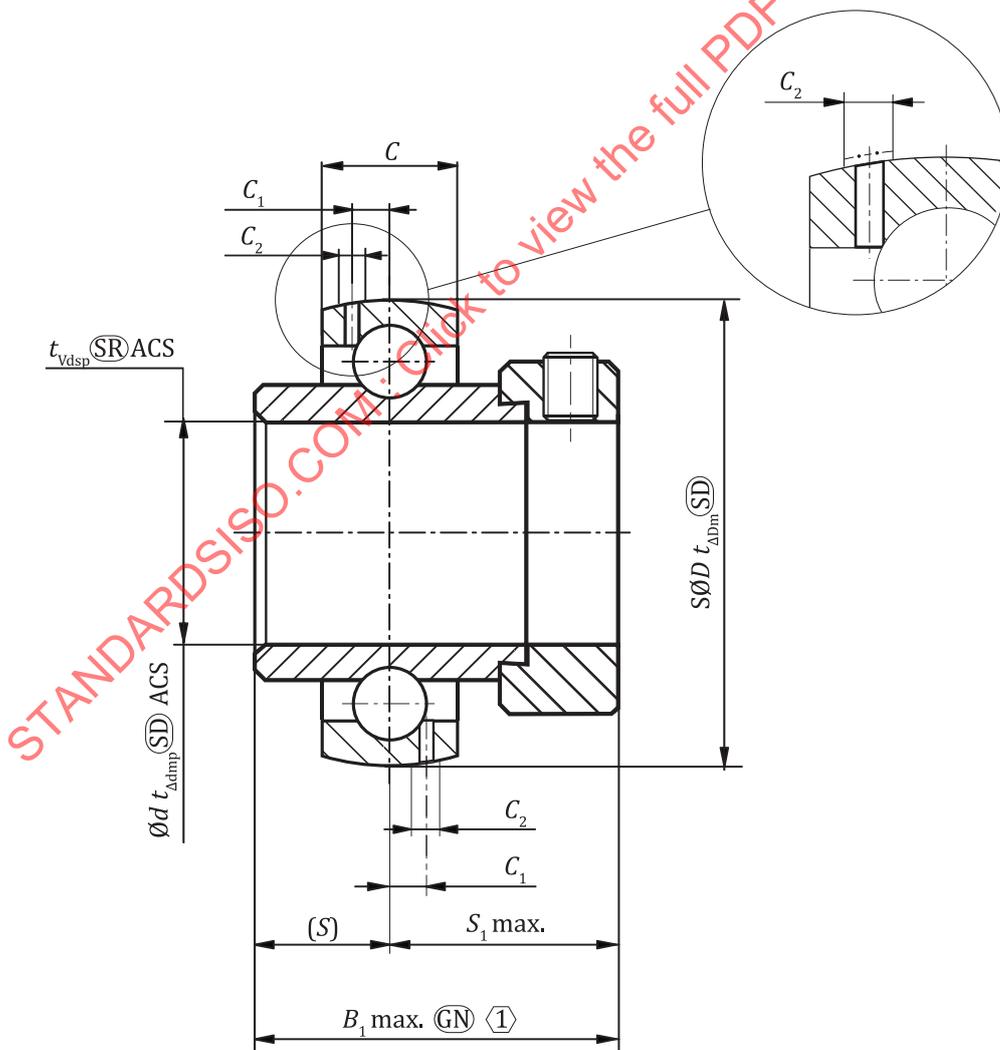
⟨1⟩ the inner ring shall be in contact with the eccentric locking collar

Figure 1 — Bearing with eccentric locking collar — Wide overall width
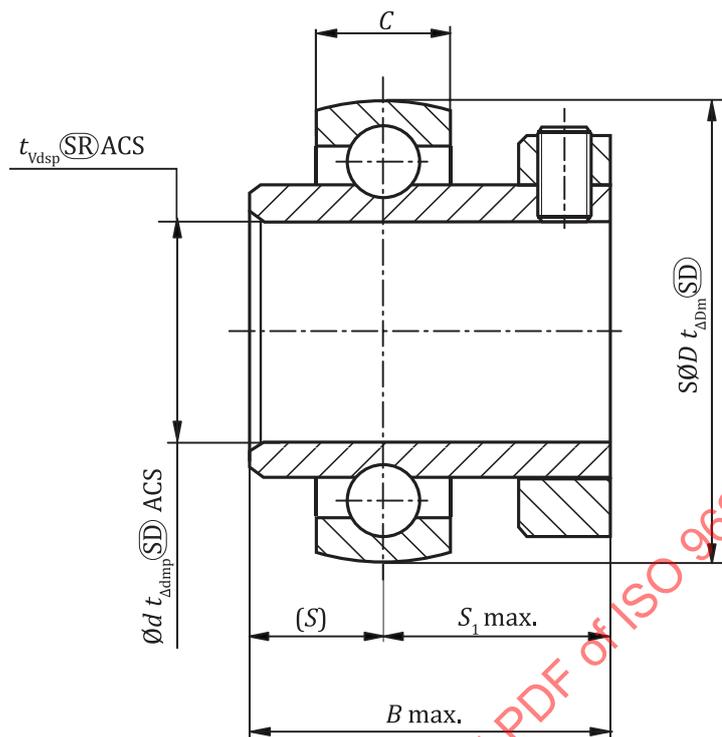
Figure 2 — Bearing with concentric locking collar around the inner ring — Intermediate overall width
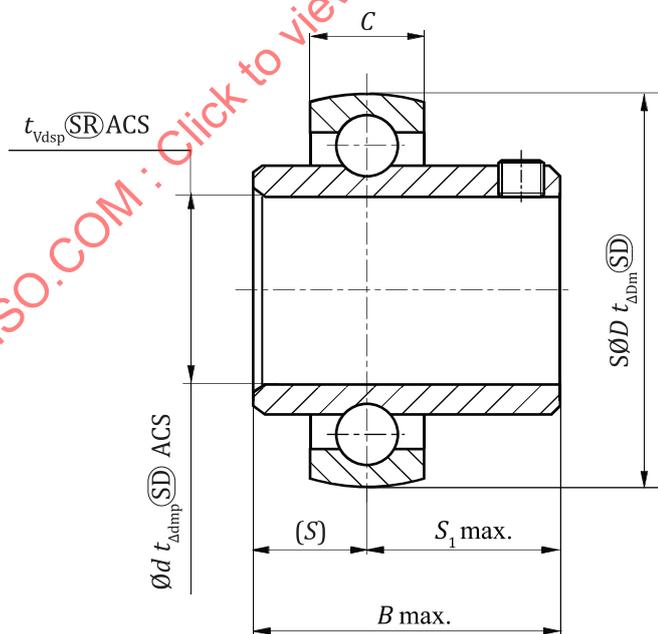
Figure 3 — Bearing with set screws in the inner ring — Intermediate overall width
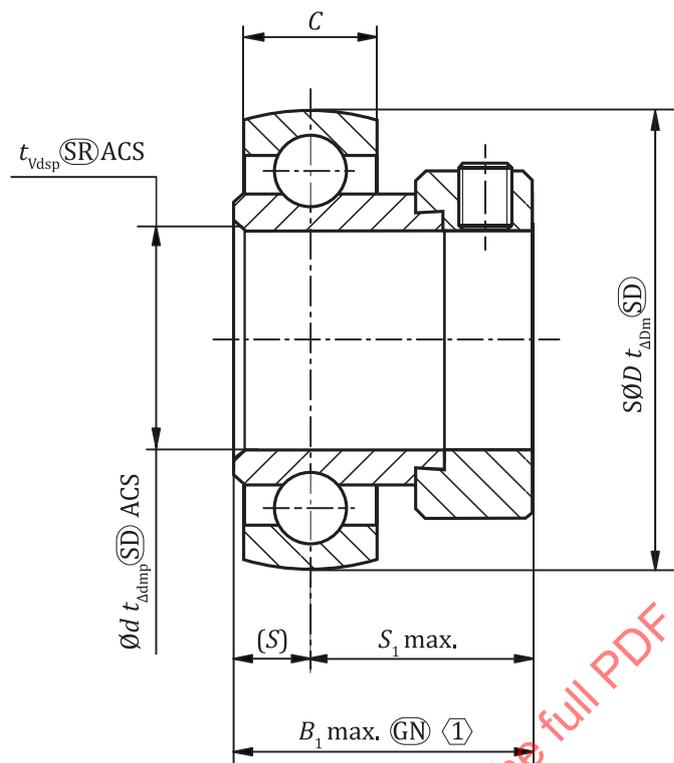
$\langle 1 \rangle$ the inner ring shall be in contact with the eccentric locking collar

Figure 4 — Bearing with eccentric locking collar — Narrow overall width
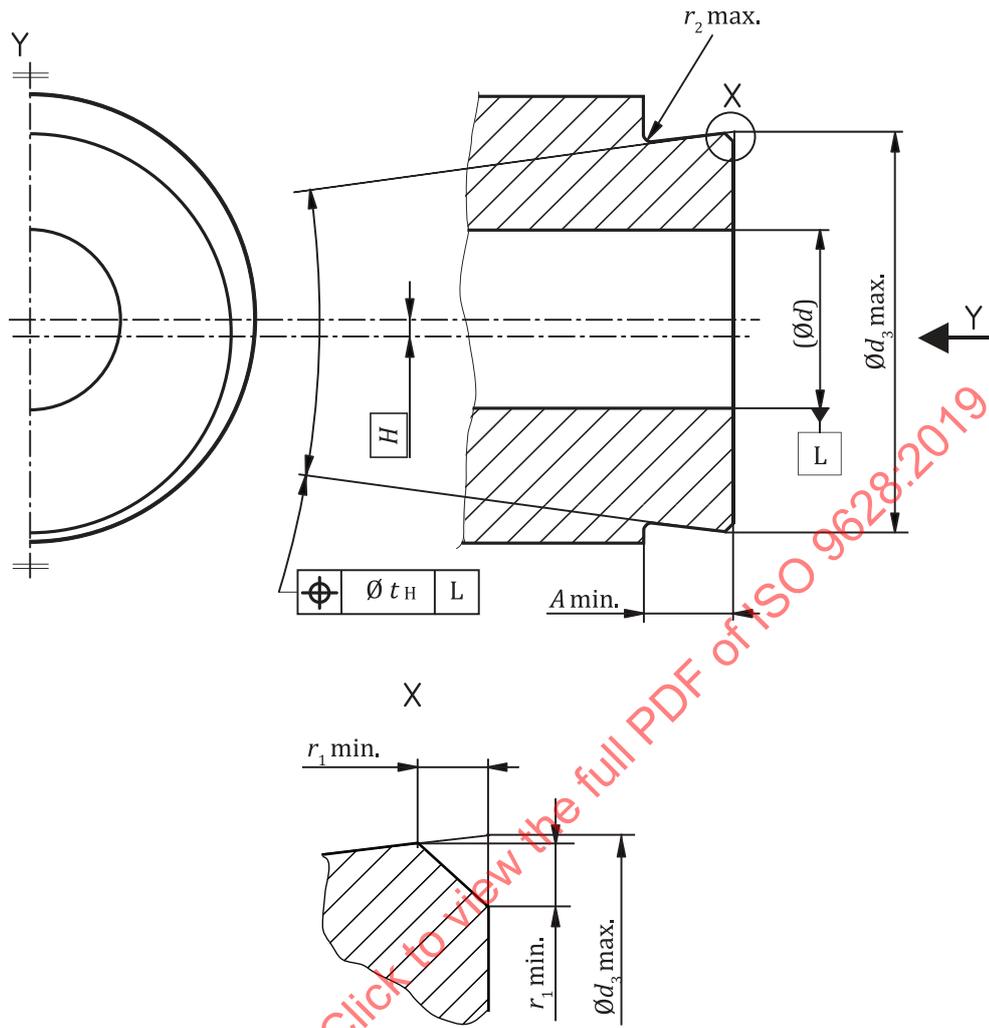
Figure 5 — Eccentric extension of inner ring
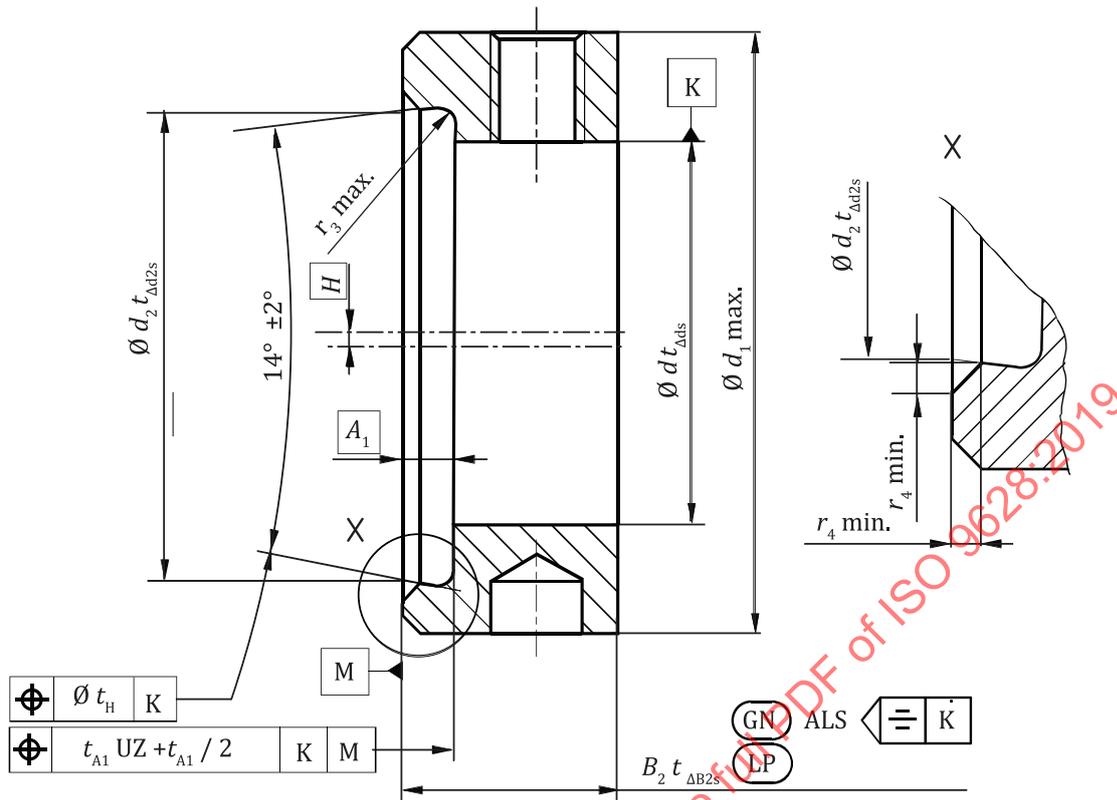
Figure 6 — Eccentric locking collar

NOTE   The "+" sign after "UZ" indicates "out of the material".

5   Characteristics and other specifications

5.1   General

The bearings on one shaft are, as a rule, mounted in two or more separate housings, which are not always perfectly aligned. The outer ring has a spherical outside surface so that the bearing can be mounted in a housing with a matching spherical seating to accommodate permanent angular misalignment.

The bore surface of the bearing inner ring and the eccentric locking collar may be plated or treated with a surface treatment to reduce corrosion during operation.

5.2   Bore diameter

For bearings with eccentric locking collar, the size of the eccentric feature on the inner ring and the locking collar is generally common for one metric and several inch inner ring bore sizes. The non-preferred inch bore sizes, which are given in parentheses in Tables 2 to 8, should be avoided whenever possible.

Contrary to general rolling bearing practice, the inner ring bore diameter tolerance is on the plus side of the nominal bore diameter, in order that the bearing and collar can be slipped over standard size shafting.

5.3   Outside diameter of bearing

The outside diameter of the bearing corresponds (with respect to the metric bore diameter) to either diameter series 2 or diameter series 3 of ISO 15[1].

5.4 Width of inner ring and locking device

The inner ring width (with respect to the metric bore diameter) does not conform to the requirements of dimension series 2 or dimension series 3 of ISO 15. It is determined by the requirements of space for sealing and locking devices and by the axial extension of the shaft support considered suitable for various applications.

Where the locking device extends axially beyond the inner ring, the width over the locking device, called the overall width, and the location with respect to the middle plane of outer ring width of the side face limiting the overall width are important dimensions and are therefore specified in this document.

Three series of overall widths are given: wide overall width, intermediate and narrow. Each of Figures 1 to 4 shows one example only of locking device design.

5.5 Width of outer ring

For bearings with a spherical outside surface, the width of the outer ring is not important, provided the range of width is known so that assembly slots in the housing can be properly dimensioned. This document therefore gives outer ring widths which range from a minimum that conforms to either dimension series 2 or dimension series 3 of ISO 15, to a maximum that provides sufficient space for various seals and relubrication holes.

5.6 Relubrication

Depending on the application, these bearings are supplied with or without means for relubrication, for example, one or more small radial holes drilled through the outer ring. The exact design and location of such means are not specified in this document. However, the width and location of a zone are given, in which any relubrication means, provided on one or both sides of the outer ring, should intersect such that the lubricant satisfactorily feeds into the bearing from the housing bore groove covering the zone.

6 Boundary dimensions

Boundary dimensions for insert bearings and eccentric locking collars are given in Tables 2 to 8.

NOTE   Boundary dimensions for eccentric extension of inner ring and eccentric locking collars of diameter series 3 are not defined.

Table 2 — Insert bearings — Wide overall width — Axially extending eccentric locking collar — Diameter series 2

d		D	C[a]		C_1[b]	C_2[b]	B_1[c]	S	S_1[d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
12	—								
12,7	1/2								
(14,288)	(9/16)								
15	—	40	12	15	3,4	2	37,3	13,9	23,4
15,875	5/8								
17	—								
(17,462)	(11/16)								
19,05	3/4	47	14	17	3,7	2	43,7	17,1	26,6
20	—								
(20,638)	(13/16)								
22,225	7/8								
(23,812)	(15/16)	52	15	17	3,9	2,5	44,4	17,5	26,9
25	—								
25,4	1								
(26,988)	(1-1/16)								
28,575	1-1/8								
30	—	62	16	19	5	2,5	48,4	18,3	30,1
30,162	1-3/16								
(31,75)	(1-1/4)								
31,75	1-1/4								
(33,338)	(1-5/16)								
34,925	1-3/8	72	17	20	5,7	3	51,1	18,8	32,3
35	—								
36,512	1-7/16								
38,1	1-1/2								
(39,688)	(1-9/16)	80	18	21	6,2	3	56,3	21,4	34,9
40	—								
(41,275)	(1-5/8)								
42,862	1-11/16								
44,45	1-3/4	85	19	22	6,4	3	56,3	21,4	34,9
45	—								

NOTE 1   See Figure 1.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B_1 is to be interpreted as B_1 max.

[d] S_1 is to be interpreted as S_1 max.

Table 2 *(continued)*

d		D	C[a]		C₁[b]	C₂[b]	B₁[c]	S	S₁[d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
(46,038) (47,625) 49,212 50 (50,8)	(1-13/16) (1-7/8) 1-15/16 — (2)	90	20	24	6,5	3,5	62,7	24,6	38,1
50,8 (52,388) (53,975) 55 55,562	2 (2-1/16) (2-1/8) — 2-3/16	100	21	25	7	3,5	71,4	27,8	43,6
57,15 (58,738) 60 (60,325) 61,912	2-1/4 (2-5/16) — (2-3/8) 2-7/16	110	22	27	7,6	4	77,8	31	46,8
(63,5) 65	(2-1/2) —	120	23	32	8,9	5	85,7	34,1	51,6
68,262 70	2-11/16 —	125	24	35	8,9	5	85,7	34,1	51,6
(71,438) 74,612 75	(2-13/16) 2-15/16 —	130	25	39	8,9	5	92,1	37,3	54,8
(79,375) 80 80,962	(3-1/8) — 3-3/16	140	26	43	8,8	6	100	40,5	59,5
85 87,312	— 3-7/16	150	28	50	10	6	106,4	43,7	62,7
90	—	160	30	50	10	6	109,6	44,5	65,1
93,662 95	3-11/16 —	170	32	50	10	6	114,3	46,8	67,5
100 100,012	— 3-15/16	180	34	51	11,2	6	125,4	50	75,4

NOTE 1   See Figure 1.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B_1 is to be interpreted as B_1 max.

[d] S_1 is to be interpreted as S_1 max.

Table 3 — Insert bearings — Wide overall width — Axially extending eccentric locking collar — Diameter series 3

d		D	C[a]		C₁[b]	C₂[b]	B₁[c]	S	S₁[d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
25	—	62	17	24	5,6	3	46,8	16,7	30,1
30	—	72	19	26	6	3	50,2	17,5	32,7
30,162	1-3/16								
31,75	1-1/4	80	21	28	6,7	3,5	51,6	18,3	33,3
33,338	1-5/16								
34,925	1-3/8								
35	—								
36,512	1-7/16								
38,1	1-1/2	90	23	30	7,5	4	57,2	19,8	37,4
40	—								
41,275	1-5/8	100	25	33	8,3	4	58,7	19,8	38,9
42,862	1-11/16								
44,45	1-3/4								
45	—								
47,625	1-7/8	110	27	35	9,5	4,5	66,7	24,6	42,1
49,212	1-15/16								
50	—								
50,8	2	120	29	37	10,3	5	73	27,8	45,2
52,388	2-1/16								
55	—								
60	—	130	31	39	11,1	5	79,4	31	48,4
61,912	2-7/16								
63,5	2-1/2	140	33	41	11,9	5,5	85,7	32,5	53,2
65	—								
68,262	2-11/16	150	35	43	12,7	6	92,1	34,1	58
70	—								
74,612	2-15/16	160	37	46	13,5	6	100	37,3	62,7
75	—								
76,2	3								
80	—	170	39	48	14,3	6,5	106,4	40,5	65,9
80,962	3-3/16								
85	—	180	41	50	15,1	7	109,5	42	67,5

NOTE   See Figure 1.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B_1 is to be interpreted as B_1 max.

[d] S_1 is to be interpreted as S_1 max.

Table 3 *(continued)*

d		D	C^a		$C_1{}^b$	$C_2{}^b$	$B_1{}^c$	S	$S_1{}^d$
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
87,312 90	3-7/16 —	190	43	52	15,9	7	115,9	42,1	73,8
95	—	200	45	54	16,7	7,5	122,3	38,9	83,4
100 100,012 101,6	— 3-15/16 4	215	47	58	18,3	8	129,6	50	79,6
105	—	225	49	60	19,1	8	139,7	48,4	91,3
110	—	240	50	62	20,6	8,5	141,3	49,2	92,1

NOTE   See Figure 1.

a   These are not tolerances; they indicate a range within which the nominal value shall fall.

b   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

c B_1 is to be interpreted as B_1 max.

d S_1 is to be interpreted as S_1 max.

Table 4 — Insert bearings — Intermediate overall width — Locking device not axially extending — Diameter series 2

d		D	C^a		$C_1{}^b$	$C_2{}^b$	B^c	S	$S_1{}^d$
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
12 12,7 (14,288) 15 15,875 17 (17,462)	— 1/2 (9/16) — 5/8 — (11/16)	40	12	15	3,4	2	27,4	11,5	15,9
19,05 20	3/4 —	47	14	17	3,7	2	31	12,7	18,3

NOTE 1   See Figures 2 and 3.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

a   These are not tolerances; they indicate a range within which the nominal value shall fall.

b   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

c B is to be interpreted as B max.

d S_1 is to be interpreted as S_1 max.

Table 4 *(continued)*

d		D	C [a]		C_1 [b]	C_2 [b]	B [c]	S	S_1 [d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
(20,638)	(13/16)	52	15	17	3,9	2,5	34,1	14,3	19,8
22,225	7/8								
(23,812)	15/16								
25	—								
25,4	1								
(26,988)	(1-1/16)	62	16	19	5	2,5	38,1	15,9	22,2
28,575	1-1/8								
30	—								
30,162	1-3/16								
(31,75)	(1-1/4)								
31,75	1-1/4	72	17	20	5,7	3	42,9	17,5	25,4
(33,338)	(1-5/16)								
34,925	(1-3/8)								
35	—								
36,512	1-7/16								
38,1	1-1/2	80	18	21	6,2	3	49,2	19	30,2
(39,688)	(1-9/16)								
40	—								
(41,275)	(1-5/8)	85	19	22	6,4	3	49,2	19	30,2
42,862	1-11/16								
44,45	1-3/4								
45	—								
(46,038)	(1-13/16)	90	20	24	6,5	3,5	51,6	19	32,6
(47,625)	(1-7/8)								
49,212	1-15/16								
50	—								
(50,8)	(2)								
50,8	2	100	21	25	7	3,5	55,6	22,2	33,4
(52,388)	(2-1/16)								
(53,975)	(2-1/8)								
55	—								
55,562	2-3/16								

NOTE 1   See Figures 2 and 3.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B is to be interpreted as B max.

[d] S_1 is to be interpreted as S_1 max.

Table 4 *(continued)*

d		D	C [a]		C_1 [b]	C_2 [b]	B [c]	S	S_1 [d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
57,15	2-1/4								
(58,738)	(2-5/16)								
60	—	110	22	27	7,6	4	65,1	25,4	39,7
(60,325)	(2-3/8)								
61,912	2-7/16								
(63,5)	(2-1/2)								
65	—	120	23	32	8,9	5	68,3	25,4	42,9
(66,675)	(2-5/8)								
68,262	2-11/16								
(69,85)	(2-3/4)	125	24	35	8,9	5	74,6	30,2	44,4
70	—								
(71,438)	(2-13/16)								
(73,025)	(2-7/8)								
74,612	2-15/16	130	25	39	8,9	5	77,8	33,3	44,5
75	—								
76,2	3								
(79,375)	(3-1/8)								
80	—	140	26	43	8,8	6	82,6	33,3	49,3
80,962	3-3/16								
(82,55)	(3-1/4)								
85	—								
(85,725)	(3-3/8)	150	28	50	10	6	85,7	34,1	51,6
87,312	3-7/16								
(88,9)	(3-1/2)								
88,9	3-1/2	160	30	50	10	6	96	39,7	56,3
90	—								
100	—								
100,012	3-15/16	180	34	51	11,2	6	108	42	66
(101,6)	(4)								

NOTE 1   See Figures 2 and 3.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B is to be interpreted as B max.

[d] S_1 is to be interpreted as S_1 max.

Table 5 — Insert bearings — Intermediate overall width — Locking device not axially extending — Diameter series 3

d		D	C[a]		C_1[b]	C_2[b]	B[c]	S	S_1[d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
25	—	62	17	24	5,6	3	38	15	23
30 30,162	— 1-3/16	72	19	26	6	3	43	17	26
31,75 33,338 34,925 35 36,512	1-1/4 1-5/16 1-3/8 — 1-7/16	80	21	28	6,7	3,5	48	19	29
38,1 40	1-1/2 —	90	23	30	7,5	4	52	19	33
41,275 42,862 44,45 45	1-5/8 1-11/16 1-3/4 —	100	25	33	8,3	4	57	22	35
47,625 49,212 50	1-7/8 1-15/16 —	110	27	35	9,5	4,5	61	22	39
50,8 52,388 55	2 2-1/16 —	120	29	37	10,3	5	66	25	41
60 61,912	— 2-7/16	130	31	39	11,1	5	71	26	45
63,5 65	2-1/2 —	140	33	41	11,9	5,5	75	30	45
68,262 70	2-11/16 —	150	35	43	12,7	6	78	33	45
74,612 75 76,2	2-15/16 — 3	160	37	46	13,5	6	82	32	50
80 80,962	— 3-3/16	170	39	48	14,3	6,5	86	34	52
85	—	180	41	50	15,1	7	96	40	56

NOTE See Figures 2 and 3.

[a] These are not tolerances; they indicate a range within which the nominal value shall fall.

[b] The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B is to be interpreted as B max.

[d] S_1 is to be interpreted as S_1 max.

Table 5 *(continued)*

d		D	C^a		$C_1{}^b$	$C_2{}^b$	B^c	S	$S_1{}^d$
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
87,312	3-7/16	190	43	52	15,9	7	96	40	56
90	—								
95	—	200	45	54	16,7	7,5	103	41	62
100	—	215	47	58	18,3	8	108	42	66
100,012	3-15/16								
101,6	4								
105	—	225	49	60	19,1	8	112	44	68
110	—	240	50	62	20,6	8,5	117	46	71
120	—	260	55	66	20,6	9	126	51	75
130	—	280	58	72	22,2	9,5	135	54	81
140	—	300	62	76	23,8	10,5	145	59	86

NOTE   See Figures 2 and 3.

a   These are not tolerances; they indicate a range within which the nominal value shall fall.

b   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that the lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

c B is to be interpreted as B max.

d S_1 is to be interpreted as S_1 max.

Table 6 — Insert bearings — Narrow overall width — Axially extending eccentric locking collar — Diameter series 2

d		D	C^a		$C_1{}^b$	$C_2{}^b$	$B_1{}^c$	S	$S_1{}^d$
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
12	—	40	12	13	3,4	2	28,6	6,5	22,1
12,7	1/2								
(14,288)	(9/16)								
15	—								
15,875	5/8								
17	—								
(17,462)	(11/16)								
19,05	3/4	47	14	15	3,7	2	31	7,5	23,5
20	—								

NOTE 1   See Figure 4.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

a   These are not tolerances; they indicate a range within which the nominal value shall fall.

b   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

c B_1 is to be interpreted as B_1 max.

d S_1 is to be interpreted as S_1 max.

Table 6 *(continued)*

d		D	C[a]		C_1[b]	C_2[b]	B_1[c]	S	S_1[d]
			≥	≤					
mm	in	mm	mm		mm	mm	mm	mm	mm
(20,638)	(13/16)								
22,225	7/8								
(23,812)	15/16	52	15	15	3,9	2,5	31	7,5	23,5
25	—								
25,4	1								
(26,988)	(1-1/16)								
28,575	1-1/8								
30	—	62	16	18	5	2,5	35,7	9	26,7
30,162	1-3/16								
(31,75)	(1-1/4)								
31,75	1-1/4								
(33,338)	(1-5/16)								
34,925	1-3/8	72	17	19	5,7	3	38,9	9,5	29,4
35	—								
36,512	1-7/16								
38,1	1-1/2								
(39,688)	(1-9/16)	80	18	22	6,2	3	43,7	11	32,7
40	—								
(41,275)	(1-5/8)								
42,862	1-11/16								
44,45	1-3/4	85	19	22	6,4	3	43,7	11	32,7
45	—								
(46,038)	(1-13/16)								
(47,625)	(1-7/8)								
49,212	1-15/16	90	20	22	6,5	3,5	43,7	11	32,7
50	—								
(50,8)	(2)								
50,8	2								
(52,388)	(2-1/16)								
(53,975)	(2-1/8)	100	21	25	7	3,5	48,4	12	36,4
55	—								
55,562	2-3/16								

NOTE 1   See Figure 4.

NOTE 2   Non-preferred inch bore sizes are shown in parentheses.

[a]   These are not tolerances; they indicate a range within which the nominal value shall fall.

[b]   The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B_1 is to be interpreted as B_1 max.

[d] S_1 is to be interpreted as S_1 max.

Table 6 *(continued)*

d		D	C [a]		C_1 [b]	C_2 [b]	B_1 [c]	S	S_1 [d]
			$\geq$	$\leq$					
mm	in	mm	mm		mm	mm	mm	mm	mm
57,15	2-1/4								
(58,738)	(2-5/16)								
60	—	110	22	27	7,6	4	53,1	13,5	39,6
(60,325)	(2-3/8)								
61,912	2-7/16								

NOTE 1 See Figure 4.

NOTE 2 Non-preferred inch bore sizes are shown in parentheses.

[a] These are not tolerances; they indicate a range within which the nominal value shall fall.

[b] The relubrication means in the outer ring, if used, shall be located on one or both sides of the outer ring in the zones defined by dimensions C_1 and C_2 in such a way that lubricant satisfactorily feeds into the bearing from a housing bore groove covering the zone.

[c] B_1 is to be interpreted as B_1 max.

[d] S_1 is to be interpreted as S_1 max.

Table 7 — Insert bearings — Inner ring eccentric extension — Wide and narrow overall width — Diameter series 2

d		d_3 [a]	H	A [b]	r_1 min.	r_2 max.
mm	in	mm	mm	mm	mm	mm
12	—					
12,7	1/2					
14,288	9/16					
15	—	21,6	0,8	4,2	0,5	0,8
15,875	5/8					
17	—					
17,462	11/16					
19,05	3/4	26,6	0,8	4,2	0,5	0,8
20	—					
20,638	13/16					
22,225	7/8					
23,812	15/16	31,6	0,8	4,2	0,5	0,8
25	—					
25,4	1					

NOTE 1 See Figures 1, 4 and 5.

NOTE 2 For preferred bearing sizes, refer to Tables 2 and 6.

[a] d_3 is to be interpreted as d_3 max.

[b] A is to be interpreted as A min.

Table 7 *(continued)*

d		d_3[a]	H	A[b]	r_1 min.	r_2 max.
mm	in	mm	mm	mm	mm	mm
26,988	1-1/16					
28,575	1-1/8					
30	—	37,9	0,8	4,2	0,5	0,8
30,162	1-3/16					
31,75	1-1/4					
31,75	1-1/4					
33,338	1-5/16					
34,925	1-3/8	44,7	0,8	4,2	0,5	0,8
35	—					
36,512	1-7/16					
38,1	1-1/2					
39,688	1-9/16	49,4	1,6	5	0,5	1,2
40	—					
41,275	1-5/8					
42,862	1-11/16					
44,45	1-3/4	54,4	1,6	5	0,5	1,2
45	—					
46,038	1-13/16					
47,625	1-7/8					
49,212	1-15/16	60	1,6	5	0,5	1,2
50	—					
50,8	2					
50,8	2					
52,388	2-1/16					
53,975	2-1/8	66,9	1,6	5	0,5	1,2
55	—					
55,562	2-3/16					
57,15	2-1/4					
58,738	2-5/16					
60	—	73,5	1,6	6,6	0,5	1,6
60,325	2-3/8					
61,912	2-7/16					
63,5	2-1/2					
65	—	78,6	1,6	6,6	0,5	1,6
68,262	2-11/16					
70	—	82	1,6	6,6	0,5	1,6

NOTE 1   See Figures 1, 4 and 5.

NOTE 2   For preferred bearing sizes, refer to Tables 2 and 6.

[a] d_3 is to be interpreted as d_3 max.

[b]   A is to be interpreted as A min.

Table 7 *(continued)*

d		d_3[a]	H	A[b]	r_1 min.	r_2 max.
mm	in	mm	mm	mm	mm	mm
71,438	2-13/16					
74,612	2-15/16	87	1,6	6,6	0,5	1,6
75	—					
79,375	3-1/8					
80	—	92,7	1,6	6,6	0,5	1,6
80,962	3-3/16					
85	—	102	1,6	6,6	0,5	1,6
87,312	3-7/16					
90	—	106,1	1,6	6,6	0,5	1,6
93,662	3-11/16	115,5	1,6	6,6	0,5	1,6
95	—					
100	—	118,9	1,6	6,6	0,5	1,6
100,012	3-15/16					

NOTE 1   See Figures 1, 4 and 5.

NOTE 2   For preferred bearing sizes, refer to Tables 2 and 6.

[a] d_3 is to be interpreted as d_3 max.

[b] A is to be interpreted as A min.

Table 8 — Eccentric locking collars for insert bearings — Wide and narrow overall width — Diameter series 2

d		d_1[a]	d_2[b]	B_2	H	A_1	r_3 max.	r_4 min.
mm	in	mm	mm	mm	mm	mm	mm	mm
12	—							
12,7	1/2							
14,288	9/16							
15	—	28,6	21,6	13,5	0,8	4	0,4	0,8
15,875	5/8							
17	—							
17,462	11/16							
19,05	3/4	33,3	26,6	13,5	0,8	4	0,4	0,8
20	—							
20,638	13/16							
22,225	7/8							
23,812	15/16	38,1	31,6	13,5	0,8	4	0,4	0,8
25	—							
25,4	1							

NOTE 1   See Figure 6.

NOTE 2   For preferred bearing sizes, refer to Tables 2 and 6.

[a] d_1 is to be interpreted as d_1 max.

[b] d_2 is to be interpreted as d_2 max.

Table 8 *(continued)*

d		d_1[a]	d_2[b]	B_2	H	A_1	r_3 max.	r_4 min.
mm	in	mm	mm	mm	mm	mm	mm	mm
26,988	1-1/16							
28,575	1-1/8							
30	—	44,5	37,9	15,9	0,8	4	0,4	0,8
30,162	1-3/16							
31,75	1-1/4							
31,75	1-1/4							
33,338	1-5/16							
34,925	1-3/8	55,6	44,7	17,5	0,8	4	0,4	0,8
35	—							
36,512	1-7/16							
38,1	1-1/2							
39,688	1-9/16	60,3	49,4	18,3	1,6	4,8	0,4	1,2
40	—							
41,275	1-5/8							
42,862	1-11/16							
44,45	1-3/4	63,5	54,4	18,3	1,6	4,8	0,4	1,2
45	—							
46,038	1-13/16							
47,625	1-7/8							
49,212	1-15/16	69,9	60	18,3	1,6	4,8	0,4	1,2
50	—							
50,8	2							
50,8	2							
52,388	2-1/16							
53,975	2-1/8	76,2	66,9	20,7	1,6	4,8	0,4	1,2
55	—							
55,562	2-3/16							
57,15	2-1/4							
58,738	2-5/16							
60	—	84,2	73,5	22,3	1,6	6,4	0,4	1,6
60,325	2-3/8							
61,912	2-7/16							
63,5	2-1/2							
65	—	97	78,6	23,9	1,6	6,4	0,4	1,6
68,262	2-11/16							
70	—	97	82	23,9	1,6	6,4	0,4	1,6

NOTE 1   See Figure 6.

NOTE 2   For preferred bearing sizes, refer to Tables 2 and 6.

[a] d_1 is to be interpreted as d_1 max.

[b] d_2 is to be interpreted as d_2 max.