Single-row, angular contact radial ball bearings with contact angles of 15° and 25°

DIN 628-6

ICS 21.100.20

Wälzlager – Radial-Schrägkugellager – Teil 6: Einreihig, Berührungswinkel 15° und 25°

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Foreword

This standard has been prepared by the *Arbeitsausschuss Wälzlager* (Rolling Bearings Standards Committee) and conforms in substance to ISO 12044 : 1995.

All dimensions are in millimetres.

1 Scope

This standard defines concepts and specifies dimensions, tolerances, preloading forces, the rigidity and designation of single-row angular contact radial ball bearings with contact angles of 15° and 25°, as well as for sets of such bearings. Angular contact ball bearings are predominantly used in machine tool spindles.

This standard gives users a selection of designs based on the general plan for rolling bearings specified in DIN 616.

2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

DIN 616	Rolling bearings – General plan
DIN 620-2	Tolerances for radial ball bearings
DIN 620-6	Chamfer dimension limits for rolling bearings
DIN 623-1	Designation system for rolling bearings
DIN 17230	Steel for rolling bearings – Technical delivery conditions
ISO 76 : 1987	Rolling bearings – Static load ratings
ISO 281 : 1990	Rolling bearings – Dynamic load ratings and rating life
ISO 12044 : 1995	Rolling bearings – Single-row angular contact ball bearings – Chamfer dimensions for outer ring non-thrust side

Continued on pages 2 to 18.

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

3 Concepts

3.1 Contact angle

The contact angle, α, is the angle between a plane perpendicular to a bearing axis and the nominal line of action of the resultant of the forces transmitted by a bearing ring to a rolling element.

3.2 Axial rigidity

The axial rigidity, c_a, is the ratio of the external axial load acting on a preloaded bearing set to the axial spring deflection resulting from the elastic deformation at the ball/raceway contacts.

NOTE: For practical purposes, it is assumed that the rings are rigid and there is no radial widening. Only elastic deformation at the ball/raceway contacts due to Hertzian pressure is taken into consideration.

3.3 Axial preload

The axial preload, F_{va}, is the force applied to the rings of a bearing or bearing set to align them axially in order to improve rigidity and running accuracy.

NOTE 1: For practical purposes, it is assumed that the rings are rigid and there is no radial widening. Only elastic deformation at the ball/raceway contacts due to Hertzian pressure is taken into consideration.

NOTE 2: The size of the preload is defined for each bearing. In practice, the prescribed load is reached when the faces of the inner and outer rings lie in the same axial plane (with no overhang).

3.4 Preload classes

Bearings as in this standard are classified according to the size of the preload (and thus their rigidity) into the following three classes: L for light preload, M for medium preload and H for heavy preload.

3.5 Universal matching bearing

A bearing which, when used together with one or more similar bearings, yields predetermined characteristics in a paired or stack set.

4 Dimensions and designation

4.1 General

The dimensions specified here comply with series 19 dimensions (bearing series 719 C and 719 D)) and series 10 dimensions (bearing series 70 C and 70 D) as specified in DIN 616.

The design shown is for illustrative purposes only, but the dimensions shall be as specified.

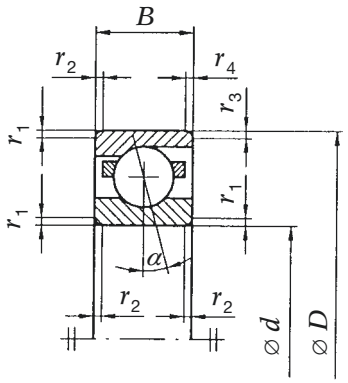
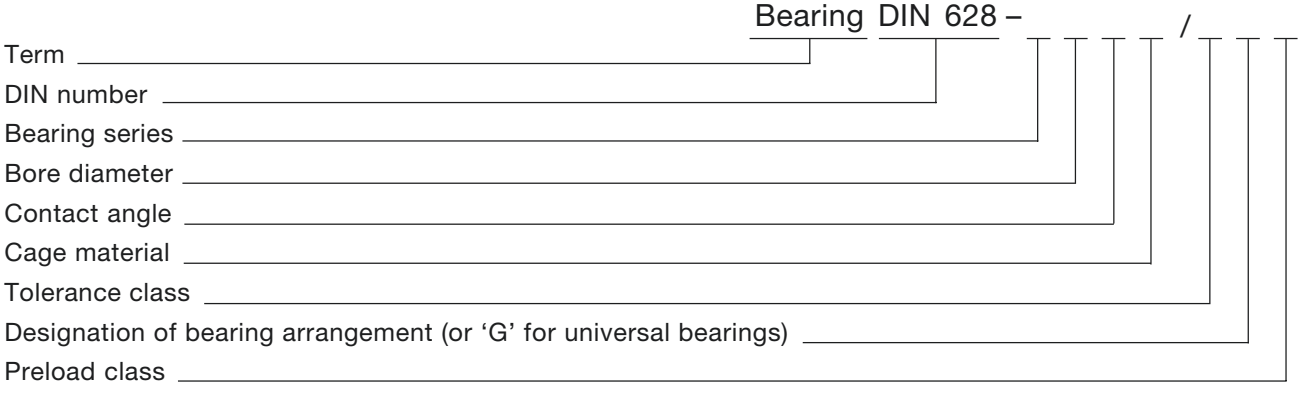


Figure 1: Single-row angular contact radial ball bearing (notation)

4.2 Designation



4.3 Examples of designation

Designation of angular contact ball bearings of bearing series 719 (719), with a bore diameter, d, of 30 mm (06), a contact angle, α, of 15° (C; 25° = D), and a plastic cage (T), of tolerance class P4S (P4S), and of preload class L (L):

Designation of a universal matching bearing (G):

Angular contact ball bearing DIN 628 – 71906 CT/P4SGL

Designation of a set of two universal matching bearings (G), with no specified arrangement (D):

Angular contact ball bearing DIN 628 – 71906 CT/P4SDGL

Designation of a set of two bearings in back-to-back arrangement (DB):

Angular contact ball bearing DIN 628 – 71906 CT/P4SDBL

4.4 Dimensions and symbols

Table 1: Dimensions and symbols[1])

d	D	B	r_1 r_2 min.	r_3 r_4 [2]) min.	Symbol for a contact angle of 15°	Symbol for a contact angle of 25°
10	22	6	0,3	0,1	71900 C	71900 D
	26	8	0,3	0,1	7000 C	7000 D
12	24	6	0,3	0,1	71901 C	71901 D
	28	8	0,3	0,1	7001 C	7001 D
15	28	7	0,3	0,1	71902 C	71902 D
	32	9	0,3	0,1	7002 C	7002 D
17	30	7	0,3	0,1	71903 C	71903 D
	35	10	0,3	0,1	7003 C	7003 D
20	37	9	0,3	0,15	71904 C	71904 D
	42	12	0,6	0,3	7004 C	7004 D
25	42	9	0,3	0,15	71905 C	71905 D
	47	12	0,6	0,3	7005 C	7005 D
30	47	9	0,3	0,15	71906 C	71906 D
	55	13	1	0,3	7006 C	7006 D
35	55	10	0,6	0,15	71907 C	71907 D
	62	14	1	0,3	7007 C	7007 D
40	62	12	0,6	0,15	71908 C	71908 D
	68	15	1	0,3	7008 C	7008 D
45	68	12	0,6	0,15	71909 C	71909 D
	75	16	1	0,3	7009 C	7009 D
50	72	12	0,6	0,15	71910 C	71910 D
	80	16	1	0,3	7010 C	7010 D
55	80	13	0,6	0,3	71911 C	71911 D
	90	18	1,1	0,6	7011 C	7011 D
60	85	13	0,6	0,3	71912 C	71912 D
	95	18	1,1	0,6	7012 C	7012 D
65	90	13	0,6	0,3	71913 C	71913 D
	100	18	1,1	0,6	7013 C	7013 D
70	100	16	0,6	0,3	71914 C	71914 D
	110	20	1,1	0,6	7014 C	7014 D
75	105	16	0,6	0,3	71915 C	71915 D
	115	20	1,1	0,6	7015 C	7015 D

[1]) See subclauses 6.1 and 6.2 for tolerances.
[2]) Values as in ISO 12044.

(continued)

Table 1 (concluded)[1])

d	D	B	r_1 r_2 min.	r_3 r_4 [2]) min.	Symbol for a contact angle of 15°	25°
80	110	16	0,6	0,3	71916 C	71916 D
	125	22	1,1	0,6	7016 C	7016 D
85	120	18	0,6	0,6	71917 C	71917 D
	130	22	1,1	0,6	7017 C	7017 D
90	125	18	0,6	0,6	71918 C	71918 D
	140	24	1,5	0,6	7018 C	7018 D
95	130	18	0,6	0,6	71919 C	71919 D
	145	24	1,5	0,6	7019 C	7019 D
100	140	20	0,6	0,6	71920 C	71920 D
	150	24	1,5	0,6	7020 C	7020 D
105	145	20	0,6	0,6	71921 C	71921 D
	160	26	2	1	7021 C	7021 D
110	150	20	0,6	0,6	71922 C	71922 D
	170	28	2	1	7022 C	7022 D
120	165	22	0,6	0,6	71924 C	71924 D
	180	28	2	1	7024 C	7024 D
130	180	24	0,6	0,6	71926 C	71926 D
	200	33	2	1	7026 C	7026 D
140	190	24	0,6	0,6	71928 C	71928 D
	210	33	2	1	7028 C	7028 D
150	210	28	1	1	71930 C	71930 D
	225	35	2,1	1	7030 C	7030 D
160	220	28	1	1	71932 C	71932 D
	240	38	2,1	1	7032 C	7032 D
170	230	28	1	1	71934 C	71934 D
	260	42	2,1	1,1	7034 C	7034 D
180	250	33	1	1	71936 C	71936 D
	280	46	2,1	1,1	7036 C	7036 D
190	260	33	1	1	71938 C	71938 D
	290	46	2,1	1,1	7038 C	7038 D
200	280	38	1	1	71940 C	71940 D
	310	51	2,1	1,1	7040 C	7040 D
220	300	38	1	1	71944 C	71944 D
	340	56	3	1,1	7044 C	7044 D
240	320	38	1	1	71948 C	71948 D
	360	56	3	1,1	7048 C	7048 D

See page 3 for [1]) and [2]).

5 Materials

Rolling elements and rings shall be made of steel as specified in DIN 17230. Cages shall be made of fibre reinforced plastic (type T as in DIN 623-1).

6 Design

6.1 Tolerances

Tolerances are of classes P4 and P2 as in DIN 620-2 (for dimensions ΔB_s and ΔC_s, the modified tolerances apply).

Tables 2 and 3 of this standard specify the values for tolerance class P4S (i.e. dimensional tolerances shall be of class P4, while for running accuracy, class P2 shall apply, both as in DIN 620-2).

6.2 Chamfer dimensions

Chamfer boundary dimensions shall be as specified in DIN 620-6.