709 ACD/P4ASuper-precision, high-capacity, single row angular contact ball bearing

Super-precision, high-capacity, single row angular contact ball bearing

These super-precision, high-capacity, single row angular contact ball bearings, with 25° contact angle, accommodate radial and axial loads acting simultaneously, where the axial load acts in one direction only. They are designed to accommodate heavy loads at relatively high speeds under low to moderate operating temperatures.

- Very high running accuracy
- Very high load carrying capacity
- Relatively high speed and stiffness

Overview

Dimensions

Bore diameter	9 mm
Outside diameter	24 mm
Width	7 mm
Contact angle	25 °

Performance

Basic dynamic load rating	3.45 kN
Basic static load rating	1.53 kN
Attainable speed for grease lubrication	75 000 r/min
Attainable speed for oil-air lubrication	110 000 r/min

Properties

Contact type	Normal contact (two-point contact)
Number of rows	1
Ring type	One-piece inner and outer rings
Design	High-capacity D
Universal matching bearing	No
Matched arrangement	No
Matched condition (axial clearance/ preload)	Not applicable
Tolerance class	P4A
Material, bearing	Bearing steel

Coating	Without
Sealing	Without
Lubricant	None

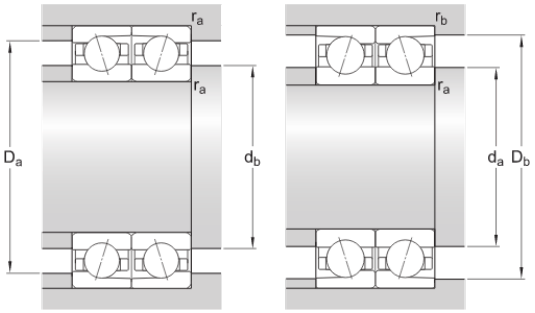
Technical Specification

Universal matching bearing(s)	No

NOT FOUND

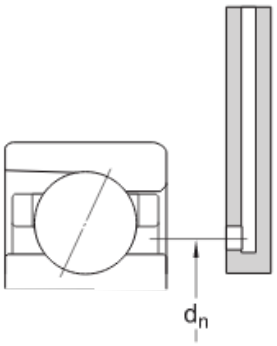
Dimensions

d	9 mm	Bore diameter
D	24 mm	Outside diameter
B	7 mm	Width
d_1	14.1 mm	Shoulder diameter of inner ring (large side face)
d_2	14.1 mm	Shoulder diameter of inner ring (small side face)
D_1	18.9 mm	Shoulder diameter of outer ring (large side face)
$r_{1,2}$	min. 0.3 mm	Chamfer dimension
$r_{3,4}$	min. 0.2 mm	Chamfer dimension
a	7.4 mm	Distance from side face to pressure point



Abutment dimensions

d_a	min. 11 mm	Diameter of shaft abutment
d_b	min. 11 mm	Diameter of shaft abutment
D_a	max. 22 mm	Diameter of housing abutment
D_b	max. 22.6 mm	Diameter of housing abutment
r_a	max. 0.3 mm	Radius of fillet
r_b	max. 0.2 mm	Radius of fillet
d_n	15.1 mm	Position of oil nozzle



Calculation data

Basic dynamic load rating	C	3.45 kN
Basic static load rating	C_0	1.53 kN
Fatigue load limit	P_u	0.064 kN
Attainable speed for grease lubrication		75 000 r/min
Attainable speed for oil-air lubrication		110 000 r/min
Contact angle	α	25 °
Ball diameter	D_w	3.969 mm
Number of rows	i	1
Number of balls (per bearing)	z	10
Reference grease quantity (per bearing)	G_{ref}	0.18 cm^3

Preload and stiffness (back-to-back, face-to-face)

Preload, class A	G_A	20 N
Axial stiffnes for preload A (sets of two brgs back to back or face to face)		30 N/µm
Preload, class B	G_B	40 N
Axial stiffness for preload B (sets of two brgs back-to-back or face-to-face)		39 N/µm
Preload, class C	G_C	80 N
Axial stiffness for preload C (sets of two brgs back-to-back or face-to-face)		51 N/µm
Preload, class D	G_D	160 N
Axial stiffness for preload D (sets of two brgs back-to-back or face-to-face)		67 N/µm

Correction factors for preload calculation

Correction factor dependent on bearing series and size	f	1.03
Correction factor dependent on contact angle	f_1	0.99
Correction factor, preload class A	f_{2A}	1
Correction factor, preload class B	f_{2B}	1.02
Correction factor, preload class C	f_{2C}	1.05
Correction factor, preload class D	f_{2D}	1.08
Correction factor for hybrid bearings	f_{HC}	1

Factors for equivalent bearing load calculation

Limiting value	e	0.68
Axial load factor (single, tandem)	Y_2	0.87
Axial load factor (single, tandem)	Y_0	0.38
Radial load factor (single, tandem)	X_2	0.41
Axial load factor (back-to-back, face-to-face)	Y_1	0.92
Axial load factor (back-to-back, face-to-face)	Y_2	1.41
Axial load factor (back-to-back, face-to-face)	Y_0	0.76
Radial load factor (back-to-back, face-to-face)	X_2	0.67

Mass

Mass	0.015 kg

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