



# 7204 CD/P4A Super-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 15° 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	20 mm
Outside diameter	47 mm
Width	14 mm
Contact angle	15 °

## Performance

Basic dynamic load rating	11.9 kN
Basic static load rating	5.85 kN
Attainable speed for grease lubrication	36 000 r/min
Attainable speed for oil-air lubrication	53 000 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



## Dimensions

d	20 mm	Bore diameter
D	47 mm	Outside diameter
B	14 mm	Width
$d_1$	29.1 mm	Shoulder diameter of inner ring (large side face)
$d_2$	29.1 mm	Shoulder diameter of inner ring (small side face)
$D_1$	38.7 mm	Shoulder diameter of outer ring (large side face)
$r_{1,2}$	min. 1 mm	Chamfer dimension
$r_{3,4}$	min. 0.3 mm	Chamfer dimension
a	11.6 mm	Distance from side face to pressure point

## Abutment dimensions

$d_a$	min. 25.6 mm	Diameter of shaft abutment
$d_b$	min. 25.6 mm	Diameter of shaft abutment
$D_a$	max. 41.4 mm	Diameter of housing abutment
$D_b$	max. 44.6 mm	Diameter of housing abutment
$r_a$	max. 1 mm	Radius of fillet
$r_b$	max. 0.3 mm	Radius of fillet
$d_n$	31.1 mm	Position of oil nozzle





## Calculation data

Basic dynamic load rating	C	11.9 kN
Basic static load rating	$C_0$	5.85 kN
Fatigue load limit	$P_u$	0.245 kN
Attainable speed for grease lubrication		36 000 r/min
Attainable speed for oil-air lubrication		53 000 r/min
Contact angle	$\alpha$	15 °
Ball diameter	$D_w$	7.938 mm
Number of rows	i	1
Number of balls (per bearing)	z	11
Reference grease quantity (per bearing)	$G_{ref}$	1.539 cm <sup>3</sup>

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

Preload, class A	$G_A$	45 N
Axial stiffness for preload A (sets of two brgs back to back or face to face)		25 N/ $\mu$ m
Preload, class B	$G_B$	90 N
Axial stiffness for preload B (sets of two brgs back-to-back or face-to-face)		33 N/ $\mu$ m
Preload, class C	$G_C$	180 N
Axial stiffness for preload C (sets of two brgs back-to-back or face-to-face)		45 N/ $\mu$ m
Preload, class D	$G_D$	360 N
Axial stiffness for preload D (sets of two brgs back-to-back or face-to-face)		63 N/ $\mu$ m

### Correction factors for preload calculation

Correction factor dependent on bearing series and size	$f$	1.03
Correction factor dependent on contact angle	$f_1$	1
Correction factor, preload class A	$f_{2A}$	1
Correction factor, preload class B	$f_{2B}$	1.01
Correction factor, preload class C	$f_{2C}$	1.03
Correction factor, preload class D	$f_{2D}$	1.05
Correction factor for hybrid bearings	$f_{HC}$	1

### Factors for equivalent bearing load calculation

Calculation factor for equivalent loads	$f_0$	8.7
Additional factors for equivalent loads		Refer to Notes 1 and 2 below

### Mass

Mass		0.1 kg
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