



# 7010 ACD/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 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	50 mm
Outside diameter	80 mm
Width	16 mm
Contact angle	25 °

## Performance

Basic dynamic load rating	28.1 kN
Basic static load rating	23.2 kN
Attainable speed for grease lubrication	15 000 r/min
Attainable speed for oil-air lubrication	24 000 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	50 mm	Bore diameter
D	80 mm	Outside diameter
B	16 mm	Width
$d_1$	59.2 mm	Shoulder diameter of inner ring (large side face)
$d_2$	59.2 mm	Shoulder diameter of inner ring (small side face)
$D_1$	70.8 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	23.2 mm	Distance from side face to pressure point

## Abutment dimensions

$d_a$	min. 54.6 mm	Diameter of shaft abutment
$d_b$	min. 54.6 mm	Diameter of shaft abutment
$D_a$	max. 75.4 mm	Diameter of housing abutment
$D_b$	max. 78 mm	Diameter of housing abutment
$r_a$	max. 1 mm	Radius of fillet
$r_b$	max. 0.3 mm	Radius of fillet
$d_n$	61.2 mm	Position of oil nozzle





## Calculation data

Basic dynamic load rating	C	28.1 kN
Basic static load rating	$C_0$	23.2 kN
Fatigue load limit	$P_u$	0.98 kN
Attainable speed for grease lubrication		15 000 r/min
Attainable speed for oil-air lubrication		24 000 r/min
Contact angle	$\alpha$	25 °
Ball diameter	$D_w$	9.525 mm
Number of rows	i	1
Number of balls (per bearing)	z	18
Reference grease quantity (per bearing)	$G_{ref}$	3.6 cm <sup>3</sup>

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

Preload, class A	$G_A$	180 N
Axial stiffness for preload A (sets of two brgs back to back or face to face)		141 N/ $\mu$ m
Preload, class B	$G_B$	360 N
Axial stiffness for preload B (sets of two brgs back-to-back or face-to-face)		184 N/ $\mu$ m
Preload, class C	$G_C$	720 N
Axial stiffness for preload C (sets of two brgs back-to-back or face-to-face)		244 N/ $\mu$ m
Preload, class D	$G_D$	1 440 N
Axial stiffness for preload D (sets of two brgs back-to-back or face-to-face)		331 N/ $\mu$ m

### Correction factors for preload calculation

Correction factor dependent on bearing series and size	$f$	1.11
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	0.25 kg
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