

## 7003 CD/P4A

Super-precision, high-capacity, single row angular contact ball bearing with 15° contact angle

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.

- 15° contact angle
- Very high running accuracy
- Very high load carrying capacity
- Relatively high speed and stiffness



### Overview

#### Dimensions

Bore diameter	17 mm
Contact angle	15 °
Outside diameter	35 mm
Width	10 mm

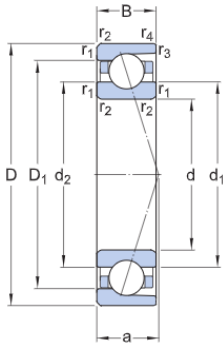
#### Performance

Attainable speed for grease lubrication	50 000 r/min
Attainable speed for oil-air lubrication	75 000 r/min
Basic dynamic load rating	6.76 kN
Basic static load rating	3.25 kN

#### Properties

Coating	Without
Contact type	Normal contact (two-point contact)
Lubricant	None
Matched arrangement	No
Matched condition (axial clearance/ preload)	Not applicable
Material, bearing	Bearing steel
Number of rows	1
Ring type	One-piece inner and outer rings
Sealing	Without
Sealing type	Not applicable
Tolerance class	P4A
Universal matching bearing	No

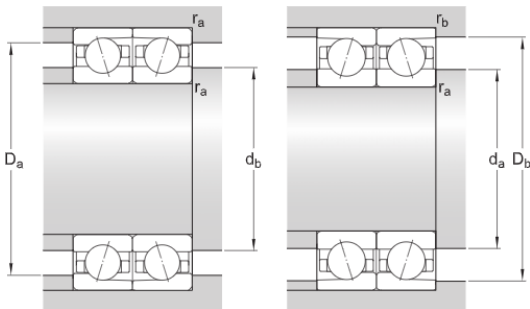
# Technical Specification



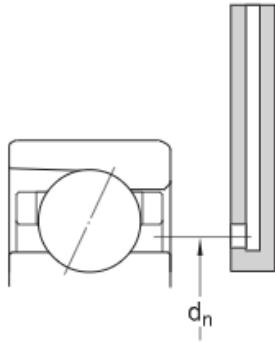
## Dimensions

d	17 mm	Bore diameter
D	35 mm	Outside diameter
B	10 mm	Width
d <sub>1</sub>	22.6 mm	Shoulder diameter of inner ring (large side face)
d <sub>2</sub>	22.6 mm	Shoulder diameter of inner ring (small side face)
D <sub>1</sub>	29.3 mm	Shoulder diameter of outer ring (large side face)
r <sub>1,2</sub>	min. 0.3 mm	Chamfer dimension (large side face)
r <sub>3,4</sub>	min. 0.2 mm	Chamfer dimension (small side face)
a	8.5 mm	Distance from side face to pressure point

## Abutment dimensions



d <sub>a</sub>	min. 19 mm	Diameter of shaft abutment
d <sub>b</sub>	min. 19 mm	Diameter of shaft abutment
D <sub>a</sub>	max. 33 mm	Diameter of housing abutment
D <sub>b</sub>	max. 33.6 mm	Diameter of housing abutment
r <sub>a</sub>	max. 0.3 mm	Radius of fillet
r <sub>b</sub>	max. 0.2 mm	Radius of fillet
d <sub>n</sub>	23.7 mm	Position of oil nozzle



## Calculation data

Basic dynamic load rating	C	6.76 kN
Basic static load rating	$C_0$	3.25 kN
Fatigue load limit	$P_u$	0.137 kN
Attainable speed for grease lubrication		50 000 r/min
Attainable speed for oil-air lubrication		75 000 r/min
Contact angle	$\alpha$	15 °
Ball diameter	$D_w$	5.556 mm
Number of balls	z	12
Reference grease quantity	$G_{ref}$	0.54 cm

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

Preload class A	$G_A$	25 N
Axial stiffness for preload A (sets of two brgs back-to-back or face-to-face)		19 N/ $\mu$ m
Preload class B	$G_B$	50 N
Axial stiffness for preload B (sets of two brgs back-to-back or face-to-face)		26 N/ $\mu$ m
Preload class C	$G_C$	100 N
Axial stiffness for preload C (sets of two brgs back-to-back or face-to-face)		35 N/ $\mu$ m
Preload class D	$G_D$	200 N
Axial stiffness for preload D (sets of two brgs back-to-back or face-to-face)		50 N/ $\mu$ m

## Calculation factors

Correction factor dependent on bearing series and size	$f$	1.04
Correction factor dependent on contact angle	$f_1$	1
Correction factor, preload class A	$f_{2A}$	1
Correction factor, preload class B	$f_{2B}$	1.02
Correction factor, preload class C	$f_{2C}$	1.05
Correction factor, preload class D	$f_{2D}$	1.09
Correction factor for hybrid bearings	$f_{HC}$	1
Calculation factor	$f_0$	9.1

## Mass

Mass	0.038 kg
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