

Angular Contact Ball Bearings

Angular Contact Ball Bearings can sustain combined loads of simultaneously acting radial and axial loads because they have a contact angle (α). The contact angle is defined as the angle between the line joining the points of contact between the ball and the raceways in the radial plane.

Single - row Angular Contact Ball Bearings

These bearings are designed with three contact angle classifications as shown in [Table 1](#).

Normally, contact angle A design and B design are fitted with a cage as shown in [Table 2](#). High precision (JIS/ISO class 5 or higher) may be fitted with a machined cage of bronze or phenolic resin or a polyamide cage.

Contact angle C design are generally applied high precision, JIS (ISO) class 5 or higher, and are fitted with a machined phenolic resin cage or a polyamide cage.

Combination Angular Contact Ball Bearings

Single-row Angular Contact Ball Bearings are seldom used as a single unit. Normally they are used as a combination of two and more units.

High precision paired combination Angular Contact Ball Bearings (JIS/ISO class 5 or higher) are used for applications such as machine tool spindles and are usually preloaded.

Three types of combinations are available :

- 1) DB, back - to - back
- 2) DF, face - to - face
- 3) DT, tandem

Because clearance of matched set parts is adjusted before shipment, care should be taken to prevent mixing of parts from other sets. Load-carrying capability of combined Angular Contact Bearings are shown in [Table 3](#).



Table 1. Contact Angle and Characteristics of Single-row Angular Contact Ball Bearings

Contact Angle Symbol	Contact Angle (α)	Example Bearing No.	Load capability comparison ⁽²⁾			Cross Section
			Speed	Radial Load Direction (X)	Axial Load Direction (Y)	
A	30°	7205 ⁽¹⁾	–	–	–	
B	40°	7205B	Less	Less	Greater	
C	15°	7205C	Greater	Greater	Less	

Note 1) Contact angle symbol "A" is omitted.

2) Axial load can be accommodated in one direction only.


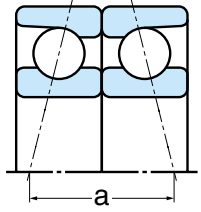

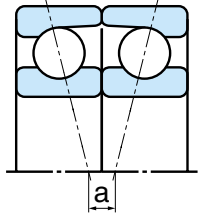
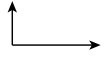
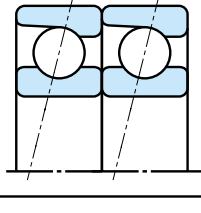
Table 2. Standard Cage Materials

(For JIS/ISO class 0 or 6)

Series	Applicable Bore Diameter Number	
	Pressed Steel	Machined Brass
72, 72B	00 ~ 22	24 ~ 40
73, 73B	00 ~ 19	20 ~ 40

Table 3. Load-carrying Characteristics

of Combination Angular Contact Ball Bearings

Configuration	Load Center Distance	Load Capability	Moment Load Rigidity	Cross Section
Back - to - Back (DB)	Long		High	
Face - to - Face (DF)	Short		Low	
Tandem (DT)	-		-	



Flush ground set combinations (Universal matching)

NACHI Angular Contact Ball Bearings with a suffix U are flush ground to permit the use of random combinations where two or more bearings are mounted.

Speed Limits

With respect to single-row or combination bearings, the dimension tables show limiting speed for bearings made with machined cages or a polyamide cages. For bearings made with pressed-cages, multiply the table limit by 0.8.

For contact angle C design bearings, the table limiting speeds are applied to high precision bearings of class 5 or higher.

These limiting speeds can be applied when a high quality grease or oil is supplied in proper quantity under light load conditions. When Angular Contact Ball Bearings are used in combination of two or more units, or with larger preload to improve rigidity, the limiting speed must be decreased. Please contact NACHI for design assistance.

Double-row Angular Contact Ball Bearings

This type bearings is made in two contact angle levels as shown in Table 4.

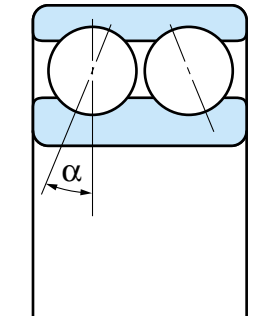
They are selected according to sustained axial and moment load.

Pressed steel cage are used for them.

Some sizes of Double-row Angular Contact Ball Bearing are available with contact seals (2NS) or shields (ZZ).

Table 4. Double-row Angular Contact Ball Bearing Contact Angles and Symbols

Contact Angle Symbol	Contact Angle (α)	Example Bearing No.
None	20°	5205
A	30°	5205A





Attention

- (1) If bearings are operated under severe conditions such as close to limiting speed, high temperature, or vibrating load, please consult NACHI.
- (2) Bearings with polyamide cage should be use at less than 120°C.
- (3) Combination Angular Contact Ball Bearings should not be mixed with those of other bearings.
- (4) When combination bearings with a optional preload is required, please contact NACHI.