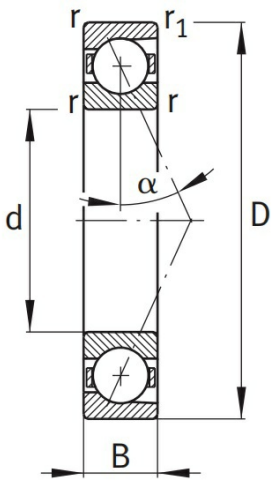
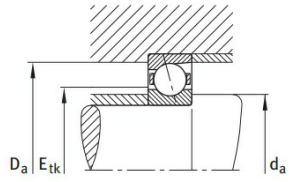
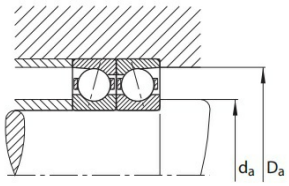
HCB7002-E-2RSD-T-P4S-QUL

Super Precision Hybrid Angular Contact Ball Bearing





Mounting dimensions



Mounting dimensions

Technical sheet of HCB7002-E-2RSD-T-P4S-QUL

Type :		Precision spindle bearings
Model :		HCB7002-E-2RSD-T-P4S-QUL
Old Code :		HCB7002E2RSDTP4SQUL
Main demensions :	15 mm × 32 mm × 9 mm	Bore Dia × Outside Dia × Width Dia
M kg:	0.027	Mass
d mm:	15	inner ring diameter
D mm:	32	Outer ring diameter
B(T) mm:	9	Overall Width
Cr kN:	5.83	Radial dynamic load rating
C0r kN:	2.028	Radial static load rating
Grease r/min:	62821	Reference speed
Oil r/min:	99872	Limiting speed

Detailed parameters and installation dimensions:

Part Number	HCB7002-E-2RSD-T-P4S-QUL
Design Type	HCB = Hybrid Standard bearing, Lager balls, Ceramic balls
Series	HCB70..-E-2RSD-T-P4S-QUL

Contact angle - α	(E) 25 °
Dimension series	70 (Medium series)
Reference From	FAG HCB7002-E-2RSD-T-P4S-QUL
Dimension Inside - d φ (mm)	15
Dimension Outside - D Φ (mm)	32
Dimension Width - B (mm)	9
Bearing set	QUL
Accuracy class	P4S
Dimension - r(min.)	0.3 mm | 0.012 inch
Dimension - r_1(min.)	0.3 mm | 0.012 inch
Seal	2RSD = Sealed on both sides
Reference speed (grease) - n_B	62821 min^{-1}
Limiting speed (oil) - n_G	99872 min^{-1}
Arrangement	QU = Set of 4 universal bearings
Preload	L = Preload Light
Mounting dimensions - d_a(h12)	19 mm | 0.748 inch
Mounting dimensions - D_a(H12)	29 mm | 1.142 inch
Bearing Type	Super Precision Hybrid Angular Contact Ball Bearing
Row No.	Four
Bore Type	Z = Cylindrical bore
Mounting dimensions - E_{tk}(nom.)	22.3 mm | 0.878 inch
Dimension Inside - d φ (inch)	0.591
Dimension Outside - D Φ (inch)	1.260
Dimension Width - B (inch)	0.354
Manufacturer Part Code	HCB7002E2RSDTP4SQUL , HCB7002E-2RSD-T-P4S-QUL
Temperature - T(min)	-30°C
Temperature - T(max)	+100°C
Units	Metric
Radial Dynamic Capacity - C_r	5830 N | 1310 lbf
Bearing Mass - m	0.027 kg | 0.060 lb
Cage	T = Laminated fabric, guidance on outer ring
Radial static Capacity - C_{0r}	2028 N | 455 lbf
Preload force - F_v L	20 N | 4 lbf
Preload force - F_v M	88 N | 19 lbf
Preload force - F_v H	197 N | 44 lbf
Ball Material	Ceramic
Axial rigidity - c_a L	30.1 N/µm
Axial rigidity - c_a M	55.6 N/µm
Axial rigidity - c_a H	76.2 N/µm
Ring Material	GCr15SiMn
Lift-off force - K_{aE} L	55 N | 12 lbf
Lift-off force - K_{aE} M	257 N | 57 lbf
Lift-off force - K_{aE} H	621 N | 139 lbf

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HCB7002-E-2RSD-T-P4S-QUL features:

1. Fundamental advantages of ceramic balls materials:
Extremely low density: Weighs only 40% of steel balls. Reduces friction, heat generation, and wear.
Low coefficient of thermal expansion: Only 25%-30% of steel. Excellent thermal stability and good spindle accuracy retention.
High hardness and wear resistance: Hardness exceeds that of bearing steel, improving fatigue life.
Excellent chemical inertness: Corrosion resistant, can operate in certain special media.
Non-magnetic and insulating: Does not generate magnetic interference and is unaffected by electromagnetic fields.

2. Design advantages of ultra-precision angular contact structures:
High stiffness: Backlash can be eliminated through preload, providing extremely high axial and radial stiffness.
High precision: "Ultra-precision" manufacturing (P4, P2, or higher, or ABEC 7, 9 standards) ensures minimal trajectory error.
High load-bearing capacity: Specific contact angle design can simultaneously withstand combined radial and axial loads.

3. Comprehensive Superior Performance:
Balance between Speed and Temperature Rise: Operates more calmly at higher speeds, avoiding the "thermal failure" bottleneck of steel bearings.
Extra-Long Service Life: Under the same operating conditions, its service life is typically 3-5 times longer than that of high-grade steel bearings.
High Performance Consistency: Under varying operating conditions and wide temperature ranges, performance fluctuations are far less than those of steel bearings.

HCB7002-E-2RSD-T-P4S-QUL application:

1. Ultra-precision CNC machine tools and machining centers: High-speed electric spindles (high-speed milling and precision engraving of molds and aerospace parts (aluminum alloys/composite materials); precision grinding spindles (for high-precision grinding of bearings, gears, and tool edges).

2. Semiconductor manufacturing equipment: Lithography machines (wafer platforms, objective systems, and other ultra-precision motion platforms); packaging and testing equipment (high-precision placement heads, probe station spindles).

3. High-end robot reducers: Key bearings in RV reducers and harmonic reducers.

4. Aerospace and special fields: Aero-engine accessory systems, UAV electric drive systems, missile guidance gyroscopes; vacuum turbomolecular pump spindles.

5. Other high-tech instruments: High-speed centrifuges (medical blood separators, laboratory centrifuges); precision measuring instruments (roundness testers, high-precision rotary tables).

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