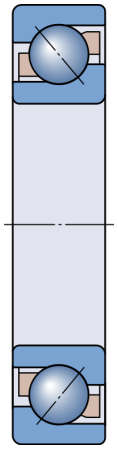
Bearing B - Axle shaft

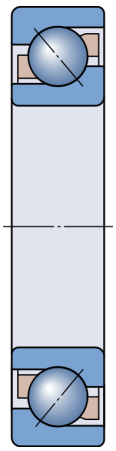
Bearing in position B mounted in the axle shaft



Emanuele Mariniello

July 14, 2020

1. Abstract



Angular contact ball bearing

errors

! The minimum load requirement is not met. Other calculations may not be available. More info

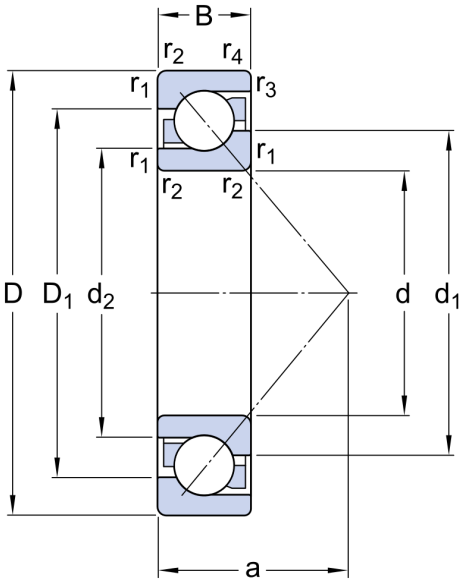
warnings

! Results are based on default operating conditions. Please, review and adjust operating conditions where needed

! High viscosity ratio k, no asperity contact. k>4 will no further increase bearing rating life but result in higher viscous frictional losses. Operating temperature must be given more attention More info

2. Input

2.1. Bearing data



Designation	Bearing type	Principal dimensions			Basic load ratings		Fatigue load limit
					Dynamic	Static	
		d	D	B	C	C_0	P_u
		mm			*kN*		
▶ 7220 BECBM	Angular contact ball bearing	100	180	34	143	134	4.75

Designation	Speed ratings	
	Reference	Limiting
	n_{ref}	n_{lim}
	r/min	
▶ 7220 BECBM	4300	5600

2.2. Loads, Speed and Temperature

	Forces		Speed	Temperature		Case weight
	Radial (F_r)	Axial (F_a)		Inner ring	Outer ring	
	kN		*r/min*	*°C*		
LC1	0.936	0.253	4026.62	70	65	1

- *Maximum temperature is used for calculating the actual viscosity, kappa, a_{SKF} and SKF rating life.*
- *Mean temperature is used for calculating bearing friction and power loss.*

2.3. Lubrication

Designation	Lubricant			Effective EP additives
	Type	Method	Name	
▶ 7220 BECBM	Grease	SKF grease	LGMT 2: all purpose industrial and automotive	False

Designation	Contamination
	Method
▶ 7220 BECBM	Detailed guidelines

3. Results

3.1. Bearing minimum load

Designation	Reaction forces		Minimum load	
	Radial	Axial		met?
	F_r	F_a	$F_{a\,m}$	
	kN			
▶ 7220 BECBM	0.936	0.253	3.87	no

errors

! The minimum load requirement is not met. Other calculations may not be available. More info

3.2. Lubrication conditions

Designation	Operating viscosity			Viscosity ratio
	Actual	Rated	Rated @ 40 °C	
	ν	ν_1	ν_{ref}	K
	mm²/s			
▶ 7220 BECBM	28.0	5.33	13.0	5.24

warnings

! High viscosity ratio k, no asperity contact. k>4 will no further increase bearing rating life but result in higher viscous frictional losses. Operating temperature must be given more attention More info