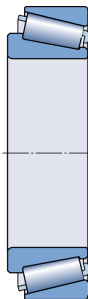


# 1. Abstract

## Calculation overview



Tapered roller bearing

 SKF Explorer

Designation	Bearing rating life	
	Basic	SKF life
	$L_{10h}$ (h)	$L_{10mh}$ (h)
<u>30230</u>	$> 2 \times 10^5$	$> 2 \times 10^5$

### Consideration

The radial load is introducing an axial load that needs to be supported by a second bearing.

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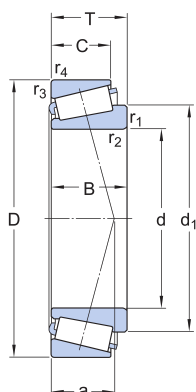
Low viscosity ratio  $k$ , reduced asperity contact. It is recommended to select a higher viscosity lubricant or improve cooling. It is not appropriate to look at basic rating life only. Instead use SKF rating life method. Recommended to use anti-wear (AW) or extreme pressure (EP) additives to reduce wear [More info](#)

### Consideration

For rating life results above 100000 hours, other failure modes than those included in the current rating life models will dominate and limit the life of the bearing.

## 2. Input

### 2.1. Bearing data



Designation	Bearing type	Principal dimensions			Basic load ratings		Fatigue load limit	Speed ratings	
					Dynamic	Static		Reference	Limiting
		d (mm)	D (mm)	B (mm)	C (kN)	C <sub>0</sub> (kN)	P <sub>u</sub> (kN)	n <sub>ref</sub> (r/min)	n <sub>lim</sub> (r/min)
<u>30230</u>	Tapered roller bearing	150.0	270.0	49.0	455.0	560.0	57.0	1800.0	2400.0

### 2.2. Loads, Speed and Temperature

	Forces		Speed	Temperature		Case weight
	Radial ( F <sub>r</sub> ) (kN)	Axial ( F <sub>a</sub> ) (kN)	(r/min)	Inner ring (°C)	Outer ring (°C)	
LC1	22.98	0.0	23.0	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	Contamination	
	Type	Method	Name		Method	Cleanliness / Factor
<u>30230</u>	Oil without filter	ISO VG (3448)	ISO VG 460	False	Detailed guidelines	ISO 4406 -/13/10

## 3. Results

### 3.1. Bearing loads

	Load ratio	Equivalent dynamic load
Designation	C/P	P (kN)
<u>30230</u>	19.8	22.98

### 3.2. Bearing minimum load

	Reaction forces		Minimum load		Requirements
Designation	Radial	Axial	to avoid separation of bearing rings		
	$F_r$ (kN)	$F_a$ (kN)	$F_{rm}$ (kN)	$F_a$ (kN)	met?
<u>30230</u>	22.98	0.0	7.74	6.57	yes

#### Consideration

The radial load is introducing an axial load that needs to be supported by a second bearing.

### 3.3. Lubrication conditions

	Operating viscosity			Viscosity ratio
Designation	Actual	Rated	Rated @ 40 °C	
	$\nu$ (mm <sup>2</sup> /s)	$\nu_1$ (mm <sup>2</sup> /s)	$\nu_{ref}$ (mm <sup>2</sup> /s)	$\kappa$
<u>30230</u>	94.7	211	> 1000	0.44

### 3.4. Bearing rating life

	Bearing rating life		SKF life modification factor	Contamination factor
Designation	Basic	SKF		
	$L_{10h}$ (h)	$L_{10mh}$ (h)	$a_{skf}$	$\eta_c$
<u>30230</u>	> 2x10 <sup>5</sup>	> 2x10 <sup>5</sup>	1.21	0.84

#### Consideration

Low viscosity ratio  $\kappa$ , reduced asperity contact. It is recommended to select a higher viscosity lubricant or improve cooling. It is not appropriate to look at basic rating life only. Instead use SKF rating life method. Recommended to use anti-wear (AW) or extreme pressure (EP) additives to reduce wear [More info](#)

#### Consideration

For rating life results above 100000 hours, other failure modes than those included in the current rating life models will dominate and limit the life of the bearing.