

KISSsoft 03/2018 – Instructions 118

Calculating Rolling Bearings with the SKF Bearing Module

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1 Application Description

1.1 Requirement

KISSsoft Release 03/2018 D (SP4) is needed to run this application. The interface described in this document is integrated in later versions. You must have a license for the W05 Rolling bearing calculation module and the modified rating life calculation W05a.

1.2 Registration

To calculate the rating life of rolling bearings with the SKF Bearing Module, run the "Rolling bearing ISO 281, ISO 76" calculation module in KISSsoft.

To give you access to SKF's cloud-based calculation program, you must first complete the form below and agree to the SKF data protection provisions.

Select "Extras/SKF Registration Tool" to open the window in which you complete registration.

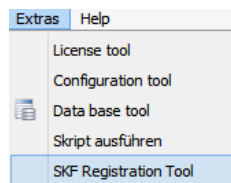


Figure 1. SKF Registration Tool

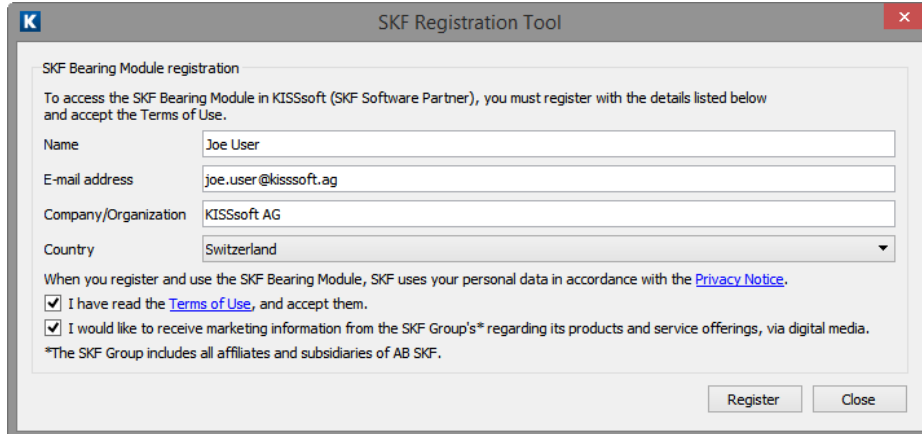
A screenshot of the 'SKF Registration Tool' dialog box. The title bar reads 'SKF Registration Tool'. The main content area is titled 'SKF Bearing Module registration' and contains the following text: 'To access the SKF Bearing Module in KISSsoft (SKF Software Partner), you must register with the details listed below and accept the Terms of Use.' Below this text are four input fields: 'Name' (containing 'Joe User'), 'E-mail address' (containing 'joe.user@kisssoft.ag'), 'Company/Organization' (containing 'KISSsoft AG'), and 'Country' (a dropdown menu showing 'Switzerland'). Below the fields is a paragraph: 'When you register and use the SKF Bearing Module, SKF uses your personal data in accordance with the [Privacy Notice](#).' This is followed by two checked checkboxes: 'I have read the [Terms of Use](#), and accept them.' and 'I would like to receive marketing information from the SKF Group's* regarding its products and service offerings, via digital media.' A footnote reads: '*The SKF Group includes all affiliates and subsidiaries of AB SKF.' At the bottom right of the dialog are two buttons: 'Register' and 'Close'.

Figure 2. Registration Tool input screen

Then click "Register" to send your registration details to SKF.
You only need to register once.

Once registration has been completed, the "Change" and "Unregister" buttons become active in this dialog. To modify data you have input, click the "Change" button. To unregister, click the "Unregister" button.

1.3 Activating the calculation

You can now enter the data for the rolling bearings in the input screen.

Figure 3. "Rolling bearing ISO 281, ISO 76" calculation module basic data input screen

Select "Calculations/Settings" to display the input window for the module-specific settings.

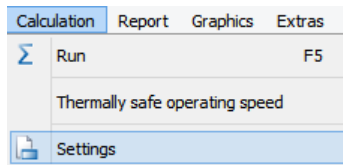


Figure 4. Settings selection

You enable "Calculate bearing performance with SKF bearing module" by selecting the checkbox marked with the red border in this window.

Figure 5. Module-specific settings

You can then perform a calculation.

1.4 Restrictions to the SKF Bearing Module

If you click the Info button next to the "Calculate bearing performance with SKF bearing module" checkbox, the system displays a help window that contains a description of the calculation and the restrictions.

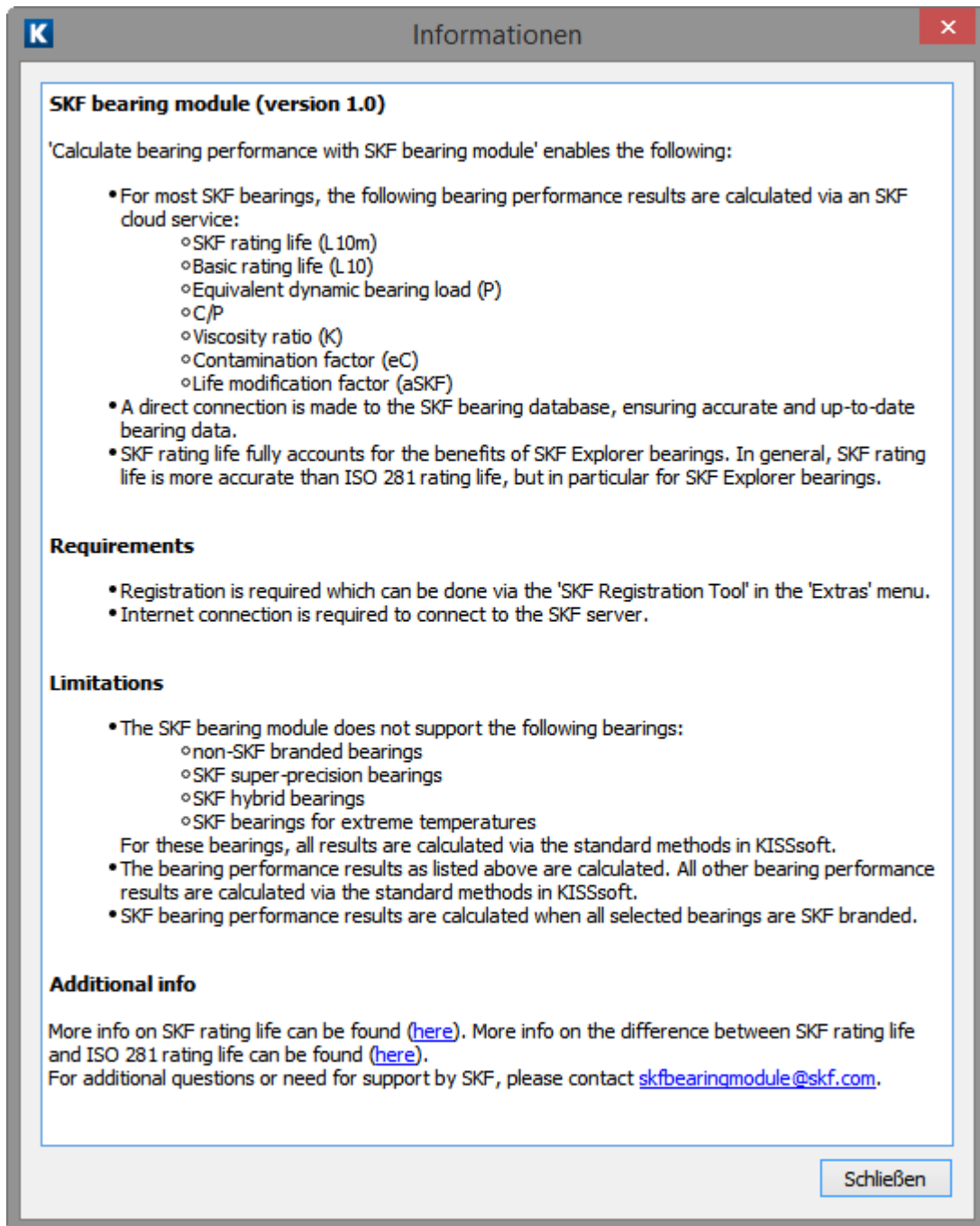


Figure 6. Help window

1.5 Results

The system displays two sets of results in the Results Overview: the rating life as calculated with the SKF Bearing Module and the rating life calculated according to ISO 281. By default, KISSsoft performs the calculation according to ISO 281. During this type of calculation, the software also determines the static safety coefficient, speed limit and torque losses.

Results		Bearing 1	Bearing 2	
Calculation with the SKF Bearing Module				
Basic rating life	[Lnh]	7170.000	5430.000	h
SKF rating life	[Lnmh]	55700.000	33500.000	h
Calculation according to ISO 281				
Basic rating life	[Lnh]	7067.093	5435.251	h
Rating life	[Lnmh]	32745.128	20657.364	h
Static safety factor	[S0]	6.075	3.874	
Speed limit	[nlm]	11000.0000	13000.0000	1/min

Figure 7. Results Overview

The data entered in the module and the results are documented in the report:

KISSsoft Release 03/2018 D		
KISSsoft- Version	KISSsoft AG	CH-8608 BUBIKON
File		
Name	: Deep groove	
Description:	KISSsoft example	
Changed by:	on: 23.11.2018	at: 14:03:51

ROLLING BEARING ANALYSIS

Calculation with SKF Bearing Module:

- Modified bearing rating life according to SKF
- Direct online access to SKF bearing database
- Includes full benefits of SKF Explorer range



General data:

Speed (1/min)	980.000
Axial force (N)	-1740.600
Required bearing rating life (h)	5000.000

Operating temperature (°C) 70

Type of oil Oil: Mobilgear 600 XP 220

Lubricant base Mineral-oil base

Kinematic viscosity oil at 40 °C (mm²/s) 220.00

Kinematic nominal viscosity at 100 degrees (mm²/s) 19.00

Specific density oil at 15 °C (kg/dm³) 0.890

Own Input

Lubricant with additive

Rolling bearing No. 1:

Designation	SKF 6208
Type	Deep groove ball bearing (single row)

SKF EXPLORER
SKF high availability item

Bearing clearance:	C0		
Radial and axial load			
Radial force (N)	[Fr]	3127.500	
Axial force (N)	[Fa]	-1740.600	
Inner diameter (mm)	[d]	40.000	
External diameter (mm)	[D]	80.000	
Width (mm)	[B]	18.000	
Basic dynamic load rating (kN)	[C]	32.500	
Basic static load rating (kN)	[C0]	19.000	
Fatigue load limit (kN)	[Cu]	0.800	
Dynamic equivalent load (N)	[P]	4332.846	
Load conditions	[C/P]	7.501	
Operating viscosity (mm ² /s)	[v]	51.794	
Viscosity ratio	[κ]	3.348	
Impurity characteristic quantity	[ec]	0.500	
Life modification factor	[aSKF]	7.770	
Life modification factor for reliability	[a1]	1.000	
Basic rating life (h)	[Lnh]	7170.000	
SKF rating life (h)	[Lnmh]	55700.000	

Results of bearing calculation according to ISO 281:2007

Speed limit (oil) (1/min)	[n.max]	11000	
Static equivalent load (N)	[P0]	3127.500	
Operating viscosity (mm ² /s)	[v]	51.701	
Reference viscosity (mm ² /s)	[v1]	19.117	
Impurity characteristic quantity	[ec]	0.500	
Life modification factor	[aISO]	4.633	
Rolling moment of friction (Nmm)	[Mrr]	135.961	
Sliding moment of friction (Nmm)	[Msl]	88.082	
Moment of friction, seals (Nmm)	[Mseal]	0.000	
Mseal according to SKF Main Catalog 10000/1 EN: 2013			
Moment of friction flow losses (Nmm)	[Mdrag]	0.000	
Total moment of friction (Nmm)	[M]	224.044	
Basic rating life (h)	[Lnh]	7067.093	
Bearing rating life (h)	[Lnmh]	32745.128	
Static safety factor	[S0]	6.075	

Rolling bearing No. 2:

Designation	SKF 6207		
Type	Deep groove ball bearing (single row)		
	SKF EXPLORER		
	SKF high availability item		
Bearing clearance:	C0		
Only radial load			
Radial force (N)	[Fr]	3949.100	
Axial force (N)	[Fa]	0.000	
Inner diameter (mm)	[d]	35.000	

External diameter (mm)	[D]	72.000
Width (mm)	[B]	17.000
Basic dynamic load rating (kN)	[C]	27.000
Basic static load rating (kN)	[C0]	15.300
Fatigue load limit (kN)	[Cu]	0.655
Dynamic equivalent load (N)	[P]	3949.100
Load conditions	[C/P]	6.837
Operating viscosity (mm ² /s)	[v]	51.794
Viscosity ratio	[k]	3.152
Impurity characteristic quantity	[ec]	0.500
Life modification factor	[aSKF]	6.170
Life modification factor for reliability	[a1]	1.000
Basic rating life (h)	[Lnh]	5430.000
SKF rating life (h)	[Lnmh]	33500.000

Results of bearing calculation according to ISO 281:2007

Speed limit (oil) (1/min)	[n.max]	13000
Static equivalent load (N)	[P0]	3949.100
Operating viscosity (mm ² /s)	[v]	51.701
Reference viscosity (mm ² /s)	[v1]	20.245
Impurity characteristic quantity	[ec]	0.500
Life modification factor	[aISO]	3.801
Rolling moment of friction (Nmm)	[Mrr]	52.274
Sliding moment of friction (Nmm)	[Msl]	57.147
Moment of friction, seals (Nmm)	[Mseal]	0.000
Mseal according to SKF Main Catalog 10000/1 EN: 2013		
Moment of friction flow losses (Nmm)	[Mdrag]	0.000
Total moment of friction (Nmm)	[M]	109.421
Basic rating life (h)	[Lnh]	5435.251
Bearing rating life (h)	[Lnmh]	20657.364
Static safety factor	[S0]	3.874

Notice:

The modified rating life calculation according to ISO 281 contains only empirical formulae for calculating the fatigue load limit, and the resulting values for aISO are sometimes very high..
The moment of friction is calculated according to the details in SKF Catalog 2013..
This is always calculated with a coefficient for additives in the lubricant mybl=0.15.

If you have any questions about the SKF bearing performance results, or a general query about SKF products, please contact SKF directly by sending an e-mail to skfbearingmodule@skf.com..

End of Report

lines: 138
