

medias®



Bearing analysis

Calculation / Installation proposal

Date: 2009-02-05 22:12:50

Attention

Please see list of warnings at the end of print out.

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1 Input

Bearing:

Designation	6308-2RSR	
Inner diameter	d	40.000 [mm]
Outer diameter	D	90.000 [mm]
Width	B	23.000 [mm]
Dynamic load rating	C	42500 [N]
Static load rating	C0	25000 [N]
Fatigue limit load	Cu	1640 [N]
Limiting speed	n_lim	5000.0 [1/min]

Limiting speed grease n_lim_g 5000.0 [1/min]

Basic frequencies:

Rollover frequency inner ring BPFi 4.95 [1/s]
 Rollover frequency outer ring BPFO 3.05 [1/s]
 Rollover frequency rolling element BSF 1.98 [1/s]
 Speed of the rolling element set for rotating inner ring FTF_i 0.38 [1/s]
 Speed of the rolling element set for rotating outer ring FTF_o 0.62 [1/s]

Lubrication data:

Permitted lubricants Only grease
 Type of lubrication grease lubrication
 Type of grease INA SM 03
 Kinematic Viscosity at 40°C ny 40 160.0 [mm²/s]
 Kinematic Viscosity at 100°C ny 100 15.5 [mm²/s]
 Contamination standard cleanliness
 External heat flow dQ/dt 0.0 [kW]

Miscellaneous data:

Environment temperature t 5 [°C]
 Influence of ambient average
 Influence vertical shaft none
 Reliability 90 %
 Condition of rotation rotating inner ring

1.1 Input data for all load cases:

Load case data

Des	q		n_i	T
	[%]		[1/min]	[°C]
Below Cut-In	10.000	Rotating	100.00	20
Cut-In	10.000	Rotating	200.00	20
Light Wind Power	30.000	Rotating	300.00	20
Strong Wind power	45.000	Rotating	500.00	20
Furled	5.000	Rotating	600.00	20

Table Explanations:

Des: Designation
 q: Time proportion
 n_i: Speed
 T: Average operating temperature

Load

Des	Fr	Fa	fz
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	[N]	[N]	
Below Cut-In	60.0	0.0	1.0
Cut-In	200.0	10.0	1.0
Light Wind Power	400.0	20.0	1.0
Strong Wind power	1000.0	80.0	1.0
Furled	1500.0	200.0	1.5

Table Explanations:

Des: Designation

Fr: Radial load

Fa: Axial load

fz: Shock factor

2 Results

2.1 Results of load cases:**Rollover frequencies**

Des	BPFO	BPFI	BSF	FTF
	[1/s]	[1/s]	[1/s]	[1/s]
Below Cut-In	5.08	8.26	3.30	0.63
Cut-In	10.15	16.51	6.59	1.27
Light Wind Power	15.23	24.77	9.89	1.90
Strong Wind power	25.38	41.28	16.48	3.17
Furled	30.46	49.54	19.78	3.81

Table Explanations:

Des: Designation

BPFO: Rollover frequency outer ring

BPFI: Rollover frequency inner ring

BSF: Rollover frequency rolling element

FTF: Speed of the rolling element set

Load factors and equivalent loads

Des	P0	P_i
	[N]	[N]
Below Cut-In	60.00	60.00
Cut-In	200.00	200.00
Light Wind Power	400.00	400.00
Strong Wind power	1000.00	1000.00
Furled	2250.00	1500.00

Table Explanations:

Des: Designation

P0: Equivalent static load

P_i: Equivalent dynamic load**Lubrication**

Des	ny	ny1	kappa	a_DIN
	[mm ² /s]	[mm ² /s]		
Below Cut-In	580.4	122.1	4.75	50.00
Cut-In	580.4	68.7	8.45	50.00
Light Wind Power	580.4	49.1	11.83	50.00
Strong Wind power	580.4	32.1	18.08	50.00
Furled	580.4	27.6	21.03	50.00

Table Explanations:

Des: Designation

ny: Kinematic Viscosity

ny1: Nominal viscosity

kappa: Viscosity ratio

a_DIN: Life adjustment factor

Bearing behaviour 6308-2RSR:

Static load safety factor	S0_min	11.111
Cumulated rating life in hours (nominal)	Lh10	> 1000000 [h]
modified rating life in hours	Lh_nm	> 1000000 [h]
Maximum equivalent static load	P0_max	2250.00 [N]
Equivalent speed	n	375.0 [1/min]
Equivalent dynamic load	P	960.38 [N]
lower guiding value for the relubrication interval	tfR_min	39100 [h]
upper guiding value for the relubrication interval	tfR_max	60100 [h]

3 Warnings

Do not overspecify the bearing - A rating life (to ISO 281) greater than 60000 hours usually leads to overspecified bearing arrangements.

Viscosity ratios kappa > 4 will not result in greater lubricant film thickness. Therefore a further increase of kappa will not result in higher life adjustment factors aDIN.

- Below Cut-In
- Cut-In
- Light Wind Power
- Strong Wind power
- Furled

Calculation of relubrication span - the load is too low. The bearing may experience slip.

- Below Cut-In
- Cut-In
- Light Wind Power
- Strong Wind power
- Furled

The grease service life is lower than the rating life. The grease service life limits the service life of the bearing unless it is relubricated.

Relubricate once a year.

$C_0/P > 100$ - a minimum load of $P > C_0/100$ is required for continuous operation.

- Below Cut-In
 - Cut-In
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2009-02-05 22:12:50 (6.0)

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