

RB | RU | RE

CONTACT THB
FOR MORE MODELS BEARING



THB CAN HELP CUSTOMERS ACHIEVE



STEADY
OPERATION



PRECISION
POSITIONING



EASY
ASSEMBLY



REDUCED MAINTENANCE
OR MAINTENANCE-FREE



LONGER
SERVICE LIFE

PRECISION CROSSED ROLLER BEARINGS

THB is determined to provide customers with tailored products configured for the working conditions of your equipment by means of technical services such as design selection, state analysis and more.

TECHNICAL SERVICES SOLUTION 1

CUSTOMER EQUIPMENT KEYWORDS

- HIGH-PRECISION POSITION CONTROL
- MAINTENANCE-FREE
- LONG RUN TIMES

THB' SOLUTION

FINAL MODEL SELECTION

THB ultimately makes its selection of each reinforced precision crossed roller bearing after taking into account the characteristics of our customers' equipment.



Fig. 1: Bearing assembly schematic

PRODUCT DESIGN OPTIMIZATION

- Optimize the internal structure design by changing the structure of the isolation block to increase oil storage capacity. Change the structure of the bearing seal contact to reduce grease loss arising from frictional heating.
- Optimize internal tolerances to reduce unwanted temperature spikes
- Improve the bearing's overall precision to ensure adequate overall positioning and rotational precision.



Fig. 2: Post-optimization bearing structure schematic

SOLUTION VERIFICATION

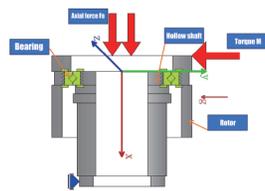


Fig. 3: Bearing assembly and stress schematic

Verification with special software: Results-oriented analysis on bearing service life and static safety is carried out by means of bearing-specific service life analysis software, proving that both service life and static safety factor fully comply with customer requirements.

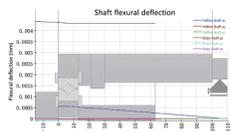


Fig. 4: Shaft flexural deflection curve

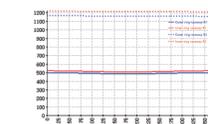


Fig. 6: Roller contact stress

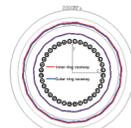


Fig. 5: Contact stress on inner and outer ring raceway

Service life complies with ISO 281

Dynamic axial load factor	K	1
Dynamic equivalent load	P	6500 N
Basic service life	L10	279,127
Basic service life	L50	200,014 h
Static equivalent load	P0	4960 N
Static safety factor (ISO 76)	SF	17,649

Fig. 7: Service life calculation results

EXPECTED BENEFITS FROM THIS SOLUTION

The product, after being delivered and put into use, is subject to regular one-month, three-month, six-month and one-year testing, verifying that it operates steadily at a high level of accuracy, yielding a service life that far exceeds customer expectations.

TECHNICAL SERVICES SOLUTION 2

CUSTOMER EQUIPMENT KEYWORDS

- ACCURATE ROTATIONAL POSITIONING
- IMPLE ASSEMBLY
- LITTLE TO NO COMMISSIONING/OVER 20,000 OSCILLATIONS

THB' SOLUTION

FINAL MODEL SELECTION

THB selects each precision crossed roller bearing based on the operating conditions and requirements of customer equipment.

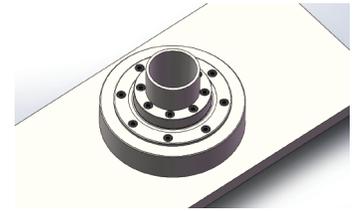


Fig. 1: Post-optimization assembly schematic

PRODUCT DESIGN OPTIMIZATION

- To meet customer requirements for easy assembly, inner and outer rings with mounting holes are selected so as to ensure a direct, form-fitting connection between the pedestal and flange.
- A preload negative clearance design is utilized, which is able to provide stable pre-load torque during rotation to ensure proper operation.

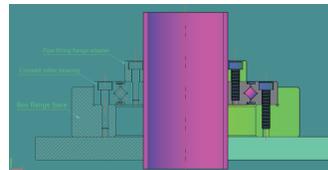


Fig. 2: Post-optimization assembly schematic

SOLUTION VERIFICATION

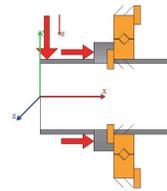


Fig. 3: Bearing assembly and stress schematic

Verification with special software: Results-oriented analysis on bearing service life and static safety is carried out by means of bearing-specific service life analysis software, proving that both service life and static safety factor fully comply with customer requirements.

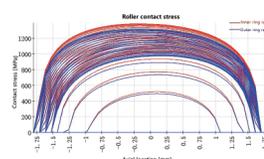


Fig. 4: Roller contact stress

Bearing results

Bearing	P [kN]	P [kN]	L10h [h]	L50h [h]	Pref [kN]	L10h [h]	L50h [h]	hmax [MPa]	SR	
Equivalent	CL5	5,507	1305955	1371277	4,574	2765726	281897	0.12	1384.43	6.35

- P : Dynamic equivalent load (ISO 281)
- L10h : Basic service life (ISO 281)
- L50h : Adjusted service life (ISO 281)
- Pref : Reference load (ISO/TS 16281)
- L10h : Basic reference rating service life (ISO/TS 16281)
- L50h : Adjusted reference rating service life (ISO/TS 16281)
- κ : Viscosity ratio
- hmax : Max. pressure
- SR : Static safety factor

Fig. 5: Bearing service life and static safety factor calculation results

EXPECTED BENEFITS FROM THIS SOLUTION

Based on customer feedback, use of our optimized product design may contribute to as much as a 50% reduction in assembly time, steady rotational precision at 4.8~5.2N.M and pipe fitting end tolerances within 0.3 mm, thus fully complying with customer requirements. Despite exceeding 50,000 oscillations, product precision continues to remain within the designed limits.