

TURBOLINK BEARINGS



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TURBOLINK BEARINGS

FINE BEARINGS FOR THE FINER FUTURE!

Turbolink is a leading manufacturer of fluid film bearings for high speed rotating machinery.

Turbolink products include a complete line of vertical bearing assembly, tilting pad journal bearing, self equalizing tilting pad thrust bearings, flatland and taper-land thrust bearings, horizontal bearing assembly, as well as medium & thin wall journal bearings. Turbolink is also well-equipped to deliver aftermarket service that optimizes the performance of critical application bearings. our dedicated special engineers diagnose, analyze, test, repair and replace worn bearings quickly and efficiently, then return them to you as good as or better than new.



1. Fine Quality

- Proven by reliability testing lab
- Use the famous white metal of Ecka granules

2. Fine Price

- Competitive price

3. Fine Delivery

- Standard lead time is no longer than 15 weeks.

4. Fine Design & Supports

- Flexible design to any special requirement
- Bearing and rotor dynamic analysis
- Failure analysis and improvement
- Fast after service globally

5. Quality Certifications

- ISO 9001 since January 2005
- ISO 14001 since October 2006
- KOSHA 18001 since December 2012

THE HISTORY OF TURBOLINK BEARING



	2001	2002	2003	2005	2006	2008	2009	2010	2011	2012	2013	2015
	Establishment of Turbolink	- SAMSUNG TECHWIN(Korea) for Turbo compressor bearings - DOOSAN H.I.(Korea) for Steam turbine & generator bearings - KOREA POWER PLANT(Korea) for Steam turbine & generator bearings	Establishment of R&D center	- Award of ISO 9001:2000 Certificate - HYUNDAI H. I.(Korea) for COPT bearings - HYUNDAI H. I.(Korea) for Motor VCB(Vertical combined bearing) bearings	- Award of NEP(new excellent Product) Certificate on Tilting pad journal bearing - HYUNDAI H. I.(Korea) for Pump VCB bearings - MHI (Japan) for COPT bearings - Award of ISO 14001:2004 Certificate	- HYOSUNG(Korea) for Horizontal motor bearings - TORISHIMA PUMP (Japan) for BFP bearings - FLOWSERVE(Spain) for VCB bearings - HYUNDAI IDEAL(USA) for VCB bearings - HYOSUNG EBARA(Korea) for Pump VCB bearings	- ABB(Finland) for Motor VCB bearings - KUBOTA (Japan) for Pump VCB bearings	- KOBELOC(Japan) for Turbo compressor bearings - SIEMENS(China) for Steam turbine bearings - WUXI-TECO(China) for Motor bearings - MELCO(Japan) for generator bearings	- Award certificate for outstanding export performance(\$1-Million export tower) - JYOTI(India) for Pump VCB bearings - HITACHI NICO(Japan) for Gear box bearings	- EBARA(Japan) for Pump VCB bearings - DMW(Japan) for Pump bearings - Award of KOSHA 18001 certificate	- Moves to a new building in Gimhae, Korea - Qingdao turbine(China) for Turbine bearings - FDPT(China) for Turbine bearings - KPCL(India) for turbo compressor bearings - KSB(Germany) for VCB bearings - KOGAS(Korea) for VCB bearings	- TM.P(Italy) for Pump bearings - FLOWSERVE(France) for Pump bearings - SEISA(Japan) for Gearbox bearings

TILTING PAD JOURNAL BEARING

Turbolink tilting pad journal bearings are numerous to ensure that the requirements of each rotating machine can be met in well. Our design skills supply a variety of pad pivot types to provide varying degrees of alignment capability, hydrostatic jacking, double tilting and electrical insulation. Turbolink can provide you the bearing characteristics of load capacity, minimum film thickness, maximum bearing metal temperature as well as stiffness and damping coefficients in order to design the bearings which are more compatible with your rotating machinery.

Turbolink received the certificate of new excellent product(NEP) from Ministry of Knowledge Economy, the Republic of Korea with tilting pad journal bearing for turbine and generators(5pad type).



Characteristics

Double tilting pad journal bearings

- Less sensitive to shaft alignment
- Pivot type : Point pivot, Ball socket pivot
- Direction of load : LOP(Load On Pads), LBP(Load Between Pads)

Anti spragging bearings

- Preloaded bearings
- Optimum pivot bearings

Hydrodynamically stable at high speed

Applications

Turbine, Generator, Compressor, Gear Box, Pump, Motor



TILTING PAD THRUST BEARING

Turbolink has designed and manufactured customized tilting pad thrust bearings for many rotating machinery based on broad experience. Self-equalizing thrust bearings have

excellent force-balancing function which allows each shoe to carry an equal amount of the total thrust load.



Characteristics

- Self-equalizing
- Less sensitive to misaligned thrust load
- Optimum pad number design
- Optimum pivot
- Direct lubrication

Applications

- Turbine, Generator, Compressor, Pump, Motor



JOURNAL & THRUST COMBINED BEARING



Turbolink Journal & Thrust combined bearings are developed for turbo-machines at high speed. High speed turbo-machines with flexible shafts demand journal bearings in terms of their

required dynamic properties ; 4 or 5 pad tilting pad journal bearings are commonly used. With tilting pads, directed lubrication is always used to reduce pad metal temperature.



Characteristics

Compact design

- The minimum practical axial length

Optimum pivot bearings

Bearings are combined as follows

- Tilting pad journal bearing & Tilting pad thrust bearing
- Multi axial groove journal bearing & Tilting pad thrust bearing
- Tilting pad journal bearing & Flat land thrust bearing
- Tilting pad journal bearing & Taper land thrust bearing

Applications

Turbo-compressor

Turbo-chiller

FIXED PROFILE BEARING



Fixed profile bearing is a kind of bearing that has been used for the longest period and its efficiency has been approved by using for long period. Fixed bearing is generally applied to the rotary machine that is loaded by heavy weight with low speed and high speed and it is widely used due to its simple design. Fixed profile bearing is applied to journal bearing

and thrust bearing as well. Combined type of bearing that has thrust surface on both ends of journal bearing is also produced. Even though multi-lobe type of journal bearing among fixed profile bearings can be used sometimes as high speed purpose, however tilting pad journal bearing is mainly used in case of very high speed in consideration of safety.

Characteristics

Simplicity

Compact

Journal bearing : Cylindrical type, Elliptical type, Multi-lobe type

Thrust bearing : Land type, Taper land type

Applications

Turbine, Generator, Compressor, Motor, Pump



MEDIUM & THIN WALL JOURNAL BEARING



Turbolink medium & thin wall journal bearings are specifically designed for high speed and light load rotating machinery which needs high stable characteristics. Turbolink can provide

high stable bearings developed based on experience, bearing analysis and rotor dynamic analysis.

Characteristics

Cost down through compact design and adaptability

Less radial space

Made as interchangeable halves

Spares easy to handle and transport

Lower stock holding costs for spares

Applications

COPT (Cargo Oil Pump Turbine)



VERTICAL GUIDE & THRUST BEARING

Turbolink vertical bearings are a standard range of vertical bearings, which are robust, lightweight (dependant on size) and self lubricating. These bearings can be fitted with a variety of resistance temperature devices to measure the temperature of the lubricating oil or pads. Turbolink

vertical combined bearings are usually self contained with water coolers which can be modified for different methods (i.e. air cooled and circulated oil variations) only by minor modification of casing.



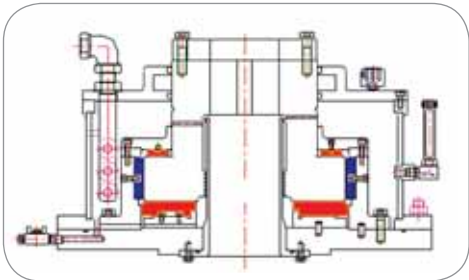
Characteristics

Guide & thrust combined bearings

- Tilting pad guide bearing + Tilting pad thrust bearing
- Cooling type : Air cooling, Fan cooling, Water cooling
- Hydrostatic lubrication

Applications

Vertical pump, Vertical motor, Generator



- Vertical guide & thrust bearing

R&D CENTER

Turbolink Research & Development center has been studying and developing high quality bearings by theoretical analysis as well as experimental analysis.

Whether the goal is greater capacity, higher operating speed, or any special requirement, each improvement Turbolink makes means more performance for you.

TEST FACILITIES

Turbolink has an on-site laboratory for operational testing. This allows us to modify our designs and verify the performance of our enhancements under various kinds of application conditions. Turbolink has several

journal bearing test rigs and one thrust bearing test rig. Circumferential distributions of film pressure and film thickness as well as bearing metal temperatures are measured according to the change of speed and load.

Bearing and Rotordynamic Analysis

When a bearing fails, accurate diagnosis is the key to repair it. Turbolink bearing experts carry out full rotating machine studies (bearing characteristic

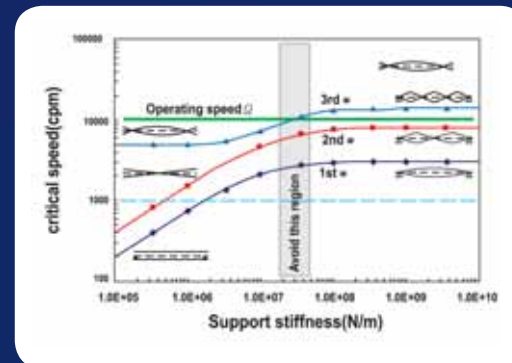
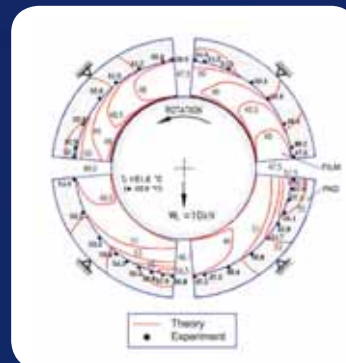
analysis and rotor dynamic analysis) of your installation to identify the cause of the malfunction and to make a proper countermeasure.

Bearing analysis

- 3-dimension thermo-hydrodynamic analysis
- Load capacity
- Power loss
- Stiffness & damping coefficients
- Stability

Rotordynamic analysis

- Bearing dynamic characteristic analysis
- Natural frequency analysis
- Unbalance response
- Stability analysis
- Transient response
- Torsional vibration analysis



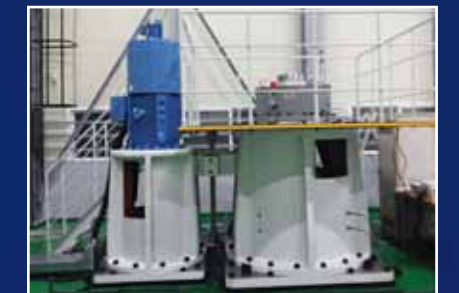
Journal bearing test rig

- Driver power : 37 kW
- Max. rotating speed : 4,500 rpm
- Max. static load : 50 kN
- Shaft diameter : 200 mm



Journal bearing test rig

- Driver power : 45 kW
- Max. rotating speed : 60,000 rpm
- Max. static load : 5 kN
- Shaft diameter : 30~40 mm

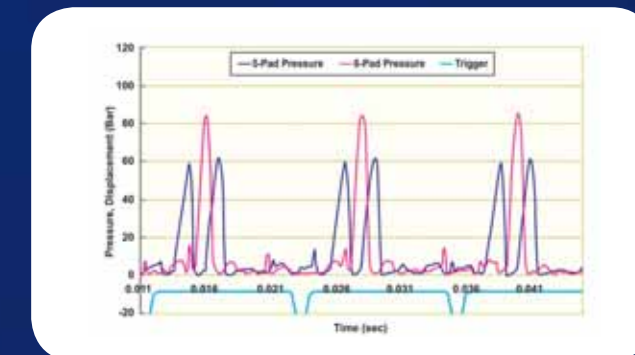


Vertical thrust bearing test rig

- Driver power: 132 kW
- Max. rotating speed: 900 rpm
- Max. static load: 1000 kN
- Max. shaft diameter: 600 mm

Measurement data

- Film pressure distribution
- Film thickness distribution
- Metal temperature
- Power loss
- Eccentricity ratio



- Circumferential pressure distribution

