Hydrodynamic Bearings
Bearings for Turbines, Compressors, Pumps, Turbomachinery
Journal | Thrust | Tilting Pad | Babbitt Bearings
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Hydrodynamic Metal Bearings Overview

Hydrodynamic Bearing Manufacturer - Introduction and History

South Korea being the 5th largest nuclear power producer (generated electricity), DMB started out as one of the largest bearing producer for S.Korean nuclear plants, often supplying the entire fluid film bearings required for new plants. We’ve been supplying hydrodynamic metal bearings and machine components to not only nuclear, hydroelectric, and renewable power plants but for global turbine, compressor, pump, engine, generator manufacturers.

With two ISO 9001 and ISO14001 certified manufacturing plants and an R&D center based in Busan, Korea, our factory is one of the few suppliers that was able to meet the needs and expectations of all six core power plants in S.Korea (Kepco). Our core competencies is in designing, manufacturing, repairing and rebabbitting of hydrodynamic bearings.

With 4 manufacturing patents and 2 design patents, our bearing designing and manufacturing skills produce quality parts for applications that require high precision, strength, and finishing quality such as power plants, gas turbines, steam turbines and generators, heavy machineries, hydro turbines, pumps, and marine propellers.

Major Clients

Over the years, we have manufactured for and served global clients providing custom designed bearings to global turbine OEM spec bearings as replacements.

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Hydrodynamic Metal Bearings Overview

Hydrodynamic Bearing Industry Served and Product Capability

- **Power Generation (Turbine, Generators for Nuclear, Thermal, Hydroelectric Plants)**
  - Turbine Bearing Assembly
  - Liner Bearing
  - Liner and Casting Assembly
  - Bearing Ring
  - Journal Bearing (Sleeve)
  - Thrust Bearing Pad
  - Guide Bearing Pad
  - Upper Guide Pad
  - Turbine Guide Bearing Shell
  - Hydraulic Sealing
  - Gas Turbine Bearings
  - Double Tilting Pad Bearing and Assembly
  - Elliptical Bearing Casing
  - Thrust Bearing Casing
  - Thrust Ring
  - Thrust Plate

- **Compressor, Pumps, Industrial Plants**
  - Pump Sleeve Bearing
  - Booster Pump Bearing
  - Thrust Pad Bearing
  - Guide Pad Bearing
  - Fan Sleeve Bearing
  - Compressor Thrust Bearing
  - Bushing Bearing
  - Labyrinth Seal
  - Lube Oil Tank Bearing
  - Pedestal Bearing – Bearing Housing

- **Shipbuilding and Marine**
  - Camshaft Bearing and Ring
  - Crosshead Bearing
  - Shell Bearing
  - Guide Shoes
  - Ship Engine Bearing
  - Stern Tube Bearing
  - Intermediate Shaft Bearing Assembly
  - Thrust Pad Bearing

Power Industry Bearings: Turbine Bearings
Generator Bearings

Our fluid film bearings are supplied to the power generation industry. Our bearings are installed inside power turbines and generators to support rotational movement of shafts. Our scope includes: Babbitt journal bearings, tilting pad bearings and assembly, thrust bearings. All our bearings are designed, manufactured in house.

Our tilting pad bearing allows bearing pads to move about a pivot, following the movement of the shaft to attain its own equilibrium position, and eliminating potential of whirl instability. Our tilting pad bearings are custom manufactured to have different number of pads, preload, pivot offset, type of pivot and orientation of the pads (LBP-load between pivots and LOP-load on pivots). Tilting pad journal bearings are applied to high speed and high performance compressors, as well as steam turbines, gas turbines and pumps, boosting dynamic stability of the rotors. We can supply the full customized pad bearing assembly, as well as the parts inside such as the casing and the pads.

**Journal bearing capability:** diameter up to 1,500 mm ID and length up to 2000 mm
**Thrust bearing capability:** 2565 mm OD

**Base Metal:** ASTM A105 / B50A517B2 / SF440A / SC450 / S20C-N, etc
**White (Babbitt) Metal:** ASTM B23 Gr2 / B21A14 / WJ2/Tegostar/ WL2, etc

[Tilting Pad Bearing Assembly for Steam Turbine](#)
[Generator Bearing](#)
[Elliptical Bearing](#)
[Journal Bearing Assembly for Steam Turbine](#)
[Thrust Plate](#)
[Self-Equalizing Tilting Pad Thrust Bearing](#)
[Non-Equalizing Tilting Pad Thrust Bearing](#)

Sample Configuration of Bearing Assembly on Steam Turbine

ELLiptical Bearing Assembly

Double TItling Pad Bearing Assembly

Thrust Bearing Assembly

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearing/
We provide specialized bearing materials for the hydro power industry. We make Babbitt bearings and a super engineered plastic material PEEK bearing that we’ve developed through a 3 year R&D partnership with the Korea Hydro & Nuclear Power. This material provides increased stability of the hydro turbine and saves material cost.

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Bearings for Oil & Gas – Pumps and Compressors

- Booster Pump Bearing (Offset Half Bearing)
- Pump Sleeve Bearing (Pressure Dam Bearing)
- Labyrinth Seal
- Bushing Bearing
- Lube Oil Tank Bearing (Lobe Bearing)
- Compressor Bearing
- Guide Pad Bearing
- LPB Tilting 5 Pad Bearing
- Fan Sleeve Bearing
- Pedestal Bearing

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
The process of manufacturing a bearing that fits GE specification starts with material selection and inspection. After tinning, we processed centrifugal casting with our centrifugal casting machine. Then we process ultra scan WM inspection before we move on to rough machining and final machining. For a bearing shell liner, we move straight into dimensional inspection and a non destructive testing before shipping out, but for a generator bearing assembly, we assemble the parts after rough machining, and go through final machining after.
The process of manufacturing a gas turbine bearings depends on the type of bearing required. For instance, our 4 pads that go inside a tilting pad bearing was manufactured by gravity casting, then a ultra scan WM inspection. After that, we processed through final machining, and dimensional check. Then we need to check for assembly clearance, and machined clearance. We finish off with PT check.

But when we make lower 2 pads for the tilting pad bearing, we start with tinning, then gravity casting. We inspect the specimen via Chalmers Test, then contact check. We then move on to machining- final machining and relief machining. Lastly we proceed to PT check and dimensional check before we ship out.

Tilting Pad Bearing (4 Pads)

Tilting Pad Bearing (Lower 2 Pads)

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Hydrodynamic Metal Bearing Quality Control

We have strict quality control processes from the designing stage, to analysis and manufacturing, with test reports at the end to produce bearings and pedestals that meet the quality.

Bearing Designing Capability

- CYLINDRICAL JOURNAL BEARING
- OFFSET HALF BEARING
- PRESSURE DAM BEARING
- ELIPTICAL JOURNAL BEARING
- TILTING PAD BEARING

Bearing Analysis

Bearing Pedestal Analysis

Pedestal bearing supporting the rotor in an independent pedestal housing separated from the main casing. Designed through FE structural analysis.

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Bearing Repair – Rebabbitting

Bearing Repairs: RCP Retrofit and Rebabbitting

As a rare quality class I certificate holder for nuclear power plant services and vast experiences providing services on-site for reactor coolant pump repair and turbomachinery repairs, our facility provides rapid bearing restoration to minimize operation costs for power plants. Our bearing repair process involves the removal of damaged babbiting metal, and Rebabbitting a new babbitting metals (or white metals) in as little as 4 days. Journal Bearing repairs involve bearing failure analysis, and bearing retrofit design.

Send in your original housing or casings for rebabbitting, and save 50% cost compared to producing a new bearing assembly.

Journal Bearing Repair case

RCP Bearing Retrofitting case

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Customized Engineering Design and Production

Power Plant Super Engineering Plastic Bearing for Aberration Generators

For the possibility of using K-PEEK instead of white metal for thrust bearing, and to lower friction and increase efficiency on the guide bearings, and to extend the life of turbine bearings

New White Metal Centrifugal Casting Method- In Partnership with TEGOSTAR

Pulverizing Mill Reduction Gear Thrust Bearing -In Partnership with KOSPO

>250 MW Gas Turbine Manufacturing Project- Bearing Supplied

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
Horizontal Test Rig – Journal and Thrust Bearing Test

Journal Bearing and Thrust Bearing with a shaft diameter of Ø 100mm ~ 200mm | Speed: 3,600rpm
Radial Load: 5 Ton | Thrust Load: 2 Ton

Vertical Test Rig – Turbine Shaft

Turbine Shaft of diameter Ø 95mm and speed of 800 rpm: 800rpm
Thrust Load: 2 Ton

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearing
Metal Bearing Manufacturing Process

**Material Supply** - Forging, Casting or Copper, etc

**Rough Machining** for size secure and Removing mill scale

**Back Metal NDT-UT/MT** Material quality check and confirm inspection by specialist

**Heat Treatment** Hydrogen removal and Stress relief

**Machining Before Babbitting** and determination of Babbit thickness

**Tinning** – 99.9% of Tin (Sn) Temp. and holding hour monitored and maintained.

**Centrifugal Casting** – rpm and jig temperature monitored

**Rough Machining After Babbitting** Inner side of Babbit metal surface machining

**White Metal /Babbitt Metal NDT / UT** - Follows the acceptance criteria of customer

**Accessory Machining** - Includes half joint machining, hold and tap machining and oil dam machining process

**Final Machining**

**White/Babbitt Metal NDT-PT** PT Testing of the Babbit material surface inside

**Inspection** - Dimensional inspection, visual inspection

**Polishing and Assembly** - Removal of dirt, and polishing burr

**Packaging and Shipping**

[http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/]
Certifications

TOSHIBA Quality Certification
This policy certifies the Quality Management System of TOSHIBA CORPORATION.

DAEDONG METAL INDUSTRY CO., LTD.
Has been complied with the TOSHIBA CORPORATION K2-60 PRODUCT OPERATIONS specified requirements for the following products:

Product(s): BEARING

Recognition: 13 April, 2010
Expiry: 12 April, 2013

IBM Quality Assurance Assessment
Senior Assurance Manager
ISO 9001:2000 Quality System

IBM
2011.01.21

HITACHI Hitachi Ltd
Products & Industrial Systems
CERTIFICATE OF APPROVAL

DAEHONG METAL INDUSTRY LTD.

Bharat Heavy Electricals Ltd
Certification of Qualification

http://www.uskoreahotlink.com/products/epc/hydrodynamic-bearings/
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