Hunan SUND Technological Corporation

Hunan SUND Technological Corporation was founded in 2003, and located in Xiangtan National High-tech Zone in Hunan Province of China. There are more than 500 employees including nearly 100 R&D engineers and technicians. SUND has a land occupation of 122 acres, which includes a 4,000 m2 R&D Center and 30,000 m2 modern workshops. SUND has been focusing on slide bearing R&D and manufacturing, also being engaged in products and service supplying concerning high-speed motor, rolling bearings, sealing, lubrication and sensor products. SUND is a leading bearing supplier of bearing products and integral solutions for transmission system.

The company's fluid film bearings, wind turbine gearbox bearings, water lubricated bearings and permanent magnet synchronous high-speed motors are widely used in energy generation, industrial drive, petrochemical industry and ships, providing basic parts for major equipment and high precision equipment such as heavy gas turbine, large steam turbine, wind power equipment, efficient compressor, high speed motor, pump and gearbox.

SUND is certified by ISO9001, ISO45001and OHSAS18001, and has been awarded the title of "Little Giant" enterprise by the Ministry of Industry and Information Technology. The company has Hunan provincial and ministerial research and development platforms such as "Sliding Bearing and Rotary Machinery Fault Diagnosis Engineering Technology Research Center" and "Hunan Key Laboratory of key components of High-end Intelligent Equipment". Up to now, we have undertaken more than 20 key projects of national and provincial science and technology, have 172 patents (including 36 invention patents), and are responsible for and participated in the formulation of 14 national standards related to sliding bearings.

SUND has been committed to the independent research and development of wind power sliding bearings since 2016, and has built a research and development platform for wind power sliding bearings. The company has mastered the simulation and analysis technology of wind power sliding bearings, and laser cladding copper-tin alloy technology. SUND established a wind turbine gearbox sliding bearing test bench of full size and full working conditions. The wind turbine gearbox sliding bearing design process and the full size test bench have been certified by DNV-GL. The company has the research and development capability of the whole process of wind turbine gearbox sliding bearings. SUND has built an internationally advanced industry 4.0 fully automated wind turbine gearbox sliding bearing production line, with a digital workshop of nearly 3000 ㎡ and constant temperature and humidity. The production line includes 6 laser cladding equipment, 3 CNC lathes, 1 CNC milling machine, 2 automatic cleaning machines, 2 logistics warehouses, 1 automatic marking system, UT testing equipment, 3 PT testing equipment, etc. with the world's leading laser cladding process, stable quality control system and super cost-effective products. SUND annual production capacity is 8000-10000pcs planet pins at present, and it is expected to reach 16000-18000pcs in the first half of 2025 when all of the equipment have

finished process efficiency improvement.

Reference List:

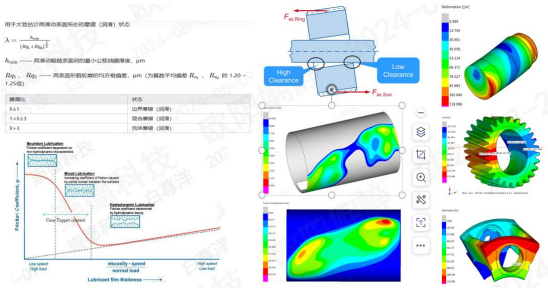
A) SUND has already supplied more than 5,000 pcs planet pins to a well-known wind turbine company, whose self-developed and self-made gearboxes are installed in over a hundred wind turbines and have already running without failure for 2 years.

B) SUND supplied a small batch of planet pins for 16MW gearboxes, which have been fully validated in the offshore wind turbines. The cladding surface area of the 1st stage planet pin exceeds 1 ㎡, which means that one pin needs to be continuously melted for 8-9 hours, it poses a great challenge to the stability of the equipment and the process.

C) SUND supplied 15MW gearbox sliding bearing samples for a well-known gearbox enterprise, which have been fully validated in their gearbox test bench.

序号	项目名称	典型项目应用情况
1	Shaft pin samples of an international enterprise	The samples had already been tested on the gearbox test bench and qualified in Finland
2	R&D 5.XMW wind turbine gearbox sliding bearing for a domestic enterprise	The samples had already been tested in SUND test bench which is being tested in customer's gearbox
3	R&D 3MW wind turbine gearbox sliding bearing for a domestic enterprise	The samples had already been tested on the gearbox test bench and passed all tests.
4	R&D 6.7MW wind turbine gearbox sliding bearing for a domestic enterprise	The samples have already been tested on the gearbox test bench and passed which is waiting for wind turbine test in the sky
5	R&D 6.7MW wind turbine gearbox sliding bearing for a domestic enterprise	The sample had already been tested in SUND test bench which is being tested in customer's gearbox
6	Make to print 8-10MW wind turbine gearbox sliding bearings for a domestic enterprise	Batch delivery
7	Make to print 16MW wind turbine gearbox sliding bearings for a domestic enterprise	small batch delivery
8	Co-developing main shaft sliding bearing with a domestic enterprise	The samples are testing at customer's test platform. SUND also had finished the scaling test at the workshop.

DNV-GL certificate
(design process and test bench)



Multiple software mutual verification

Full-size wind turbine gearbox sliding bearing test bench

Test items	Time
Running-in	40h
Single blade installation	5 times
Rated load	More than 200h
Overload of 110%	60h
Overload of 120%	30h
Overload of 130%	20h
Other working conditions as described in the LDD	More than 100h
Rapid variable speed and load working condition	2h
Start and stop	6000 times
Dry friction and swing working condition	200h

International advanced industrial 4.0 fully automated, laser cladding wind power sliding bearing manufacturing workshop

Wind turbine gearbox sliding bearings

As a leading provider of sliding bearings and transmission system solutions, Hunan SUND Technological Corporation will continue to uphold the spirit of innovation, excellence and professionalism, committed to a more reliable, efficient, environmentally friendly, intelligent industrial civilization, and contribute to the global wind power industry.