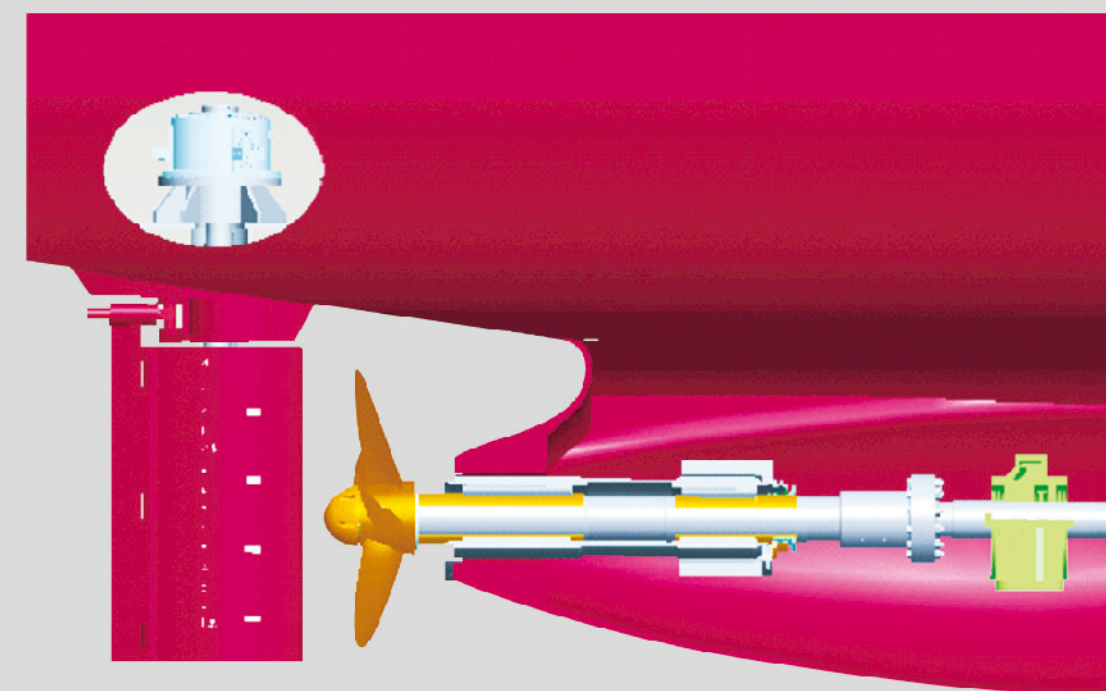




南京高精船用设备有限公司
Nanjing High Accurate Marine Equipment Co.,Ltd



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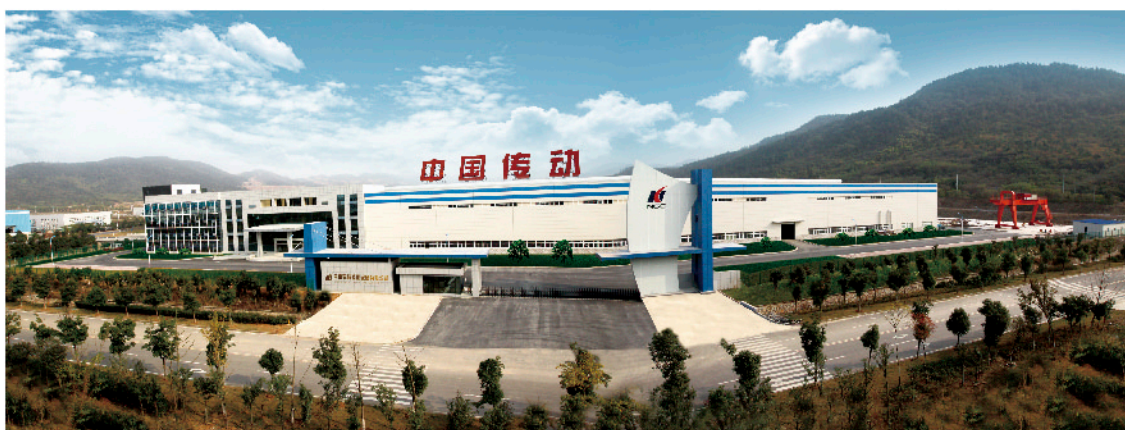
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2012

NGC船用轴舵系产品

NGC marine shaft & rudder products

公司简介 Company Profile



南京高精船用设备有限公司是中国高速传动设备集团（简称中国传动）全资子公司，可以成套提供原动机以后的各种传动和推进设备，包括可调桨、定距桨、舵桨、侧推、各种船用主/辅齿轮箱以及各种轴舵系部件和甲板机械等。

船用公司位于风景秀丽、交通便利的南京江宁科学园，现已建成占地256亩的船用产品产业园。现有员工400余人，工程技术人员120人，高级工程师23人、高级技师31人。

船用公司作为江苏省高新技术企业，通过多年技术引进和创新，已拥有具有自主知识产权的船用产品系列，并配有世界一流的生产设备，已形成年产400套推进器和齿轮箱的设计和生产能力。可根据不同船型和要求，进行周到的个性化设计，从而实现产品效率高、能耗低的环保要求。所生产的船用产品已经大量出口海外市场，产品质量达到国际标准，赢得客户和合作伙伴的高度认可。

船用公司建有完善的质量体系，先后通过了ISO9001、ISO14001、ISO18001和国军标体系认证。船用产品严格按照国际标准和船级社的要求进行设计和生产，已通过CCS、BV、GL、ABS、LR、RINA、DNV和RMRS等船级社的认证和检验。

公司通过产品质量和技术服务来创造品牌，把建立国际一流的大型船用设备配套企业作为目标，致力于为客户提供各种船舶传动和推进系统的最佳解决方案。现在公司建立了全球的销售和售后服务网络，正不断拓展国内外的船用配套产品市场，并赢得全球客户的赞誉。

Nanjing High Accurate Marine Equipment Co., Ltd. (NGC Marine for short), a wholly subsidiary of China Transmission, is specialized to manufacture marine propulsion and transmission system package, including controllable pitch propeller, fixed pitch propeller, tunnel thruster, azimuth thruster, main/auxiliary marine gearbox, hydraulic coupling, shafting rudder system components and deck machineries, etc.

The company is located at Science Garden, Jiangning District, Nanjing city, a scenic place with convenient transportation. Till today, a marine equipment garden of 173, 400 m² has been formed. The company occupies over 400 employees, and among them 120 are engineers, 23 are senior engineers, and 31 are senior technicians.

As a hi-tech enterprise in Jiangsu Province, NGC Marine has mastered the core technology of marine propulsion system to form our own product line based on the technology import and innovation. Now, we are able to design and produce 400 sets of CPP and marine gearbox per year and we can make the special design based on the ship hull and customer requirement, so as to improve the efficiency and reduce the energy consumption. Our products, machined to International Standard, have been exported to several foreign countries and have been highly recognized by the clients and partners.

NGC Marine has established a complete quality system, and has been certificated by ISO9001, ISO1400, ISO18001 and Military Standard System.

All of our marine products are designed and manufactured strictly adhered to international standards and requirements of Classification Societies. The company has been approved by CCS, BV, GL, ABS, LR, RINA, DNV and RMRS, etc.

To create our brand through quality and technical service, NGC Marine is aiming to build an international top enterprise in supplying large marine equipment. For years, NGC Marine applies itself to provide the optimal propulsion and transmission solution to clients. Our company has set up its global sales and service net, and has gained the good comments from the clients all over the world.

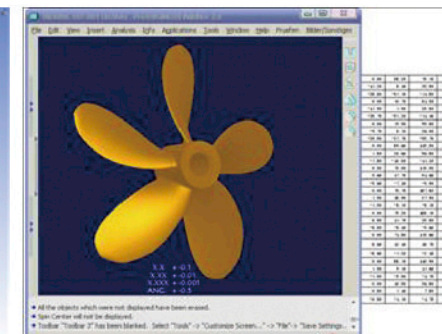
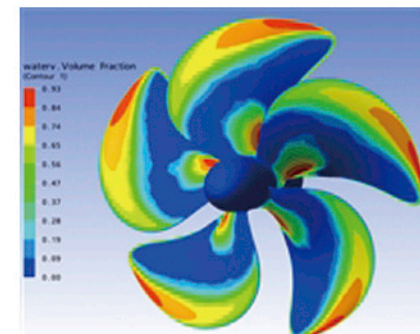
螺旋桨设计 Propeller design

NGC既有一流的现代化生产设备和厂区，也有专业的轴舵系设计、生产和检验团队，可以根据客户提供的船体尺寸、船体线性、船模试验数据和主机参数等信息来进行船舶推进系统方案设计及设备选型。既可以提供单个轴舵系部件，也可以提供轴舵系打包服务，对于船舶设计和建造方来说，既可以得到专业的服务，又可以节省成本和管理时间。

Owning top ranking modern machines and plants, NGC also has a professional designing, manufacturing and inspecting team of shaft & rudder system. Our engineers are able to work out the solution and equipment selection according to the hull dimension, hull form, and ship model test data provided by the clients. We can supply single component of shaft & rudder system, and also the system package as well. For the ship builder and designer, they can get the professional service and reduce the cost and management time at one time.

充分考虑了船舶的实际工况要求，并在机-桨-船优化匹配的前提下，通过结合升力面法和黏流数值分析的组合设计方法设计出最佳的桨叶型值，后续辅以船和桨的模型试验来进行相关参数修正，最终使螺旋桨的推进效率、空泡系数和振动达到最优。

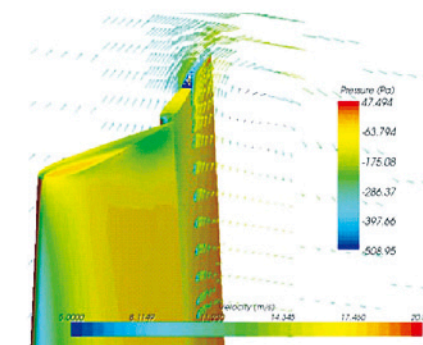
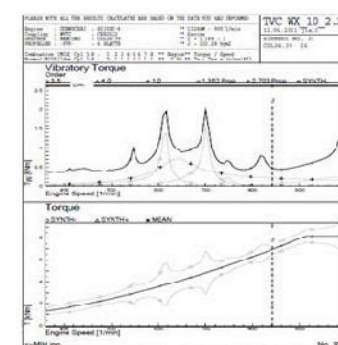
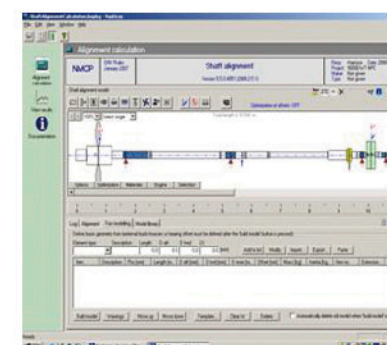
Taking the real operation condition of the ship into the consideration, our engineers come out with the optimal propeller blade design via lifting surface method and viscous flow numerical analysis so as to have the optimized matching of engine-propeller-ship; in addition, to get the perfect propulsion efficiency, cavitations factor and vibration level, we do the model test to correct relative parameters.



轴舵系设计 Shaft & rudder system design

专业软件CAD/CAM/CAE和DNV轴系计算软件的大量应用，不仅提高了工作效率，而且使我们的方案设计更加优化。轴系计算上充分考虑一些不利因素对轴系强度、振动及校中的影响，使计算结果更加贴近实际工况。另外，我们与专业科研院所的深入合作，使得我们的轴舵系设计方案更有针对性，确保船舶具有良好的推进性能及操纵性能。

The application of special CAD/CAM/CAE software and DNV shafting calculation software improves the working efficiency, and optimizes our solution. Taking into consideration of negative factors to the shafting strength, vibration and alignment, the calculation result is more matchable with the real working condition. In addition, based on our cooperation with professional researching institute, our shaft & rudder systems solution is more objective and to ensure the good propulsion performance and maneuverability.



轴系部件 Shafting components

公司有125吨起重行车、中频融化电炉（一次性投料可达150吨）、11米三坐标数显螺旋仪、大型静平衡仪、大型数控卧车、大型数控立车、大型轧辊磨床、大型数控铣床、大型镗孔机和日本东芝加工中心等主要生产设备200多台，能年生产单件净重100吨、直径11米之内的船用螺旋桨6000余吨和直径1.6米、长16米之内轴系100多套。

Main equipments: over 200 sets of advanced equipment, such as 125T crane, mid-frequency melting furnace (lowering of charge reaches to 150T per time), 11M 3-coordinate digital pitch meter, large static balance meter, large CNC horizontal lathe, large CNC vertical lathe, large rolling grinder, large CNC boring & milling machine, large boring machine and Toshiba machining center. The annual production capacity is 6,000 tons of marine propellers and over 100 sets of shaft lines. The company is able to produce a single-piece of fixed propeller with a net weight up to 100 tons and a diameter up to 11 meter, and shaft at the length of 16m at the diameter of 1.6m.



螺旋桨
 ◎高速桨、导管桨、大盘面比桨、超大型桨
 ◎液压联接、键联接
 ◎材料: Cu1、Cu2、Cu3、Cu4

Propeller
 ◎high speed propeller, nozzle propeller, big area ratio, large-sized propeller
 ◎hydraulic connection
 key connection
 ◎material: Cu1, Cu2, Cu3, Cu4



液压螺母
 ◎方便安装及锁紧螺旋桨

Hydraulic nut
 ◎easy to mount and lock the propeller

艏管
 ◎整体焊接式、分体式
 ◎由铸钢、锻钢、低碳钢制成

Stern tube
 ◎one-piece welding type, split type
 ◎made of casting steel, forging steel, low carbon steel



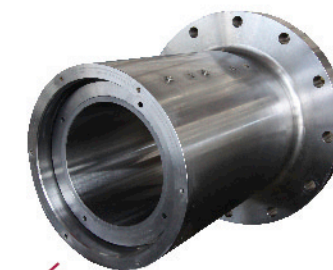
轴承
 ◎油润滑（白合金）
 ◎水润滑（橡胶或高分子）

Bearing
 ◎oil lub (white metal)
 ◎water lub (rubber or high polymer)



液压联轴节
 ◎法兰式、套筒式
 ◎带中间套型、无中间套型

Hydraulic coupling
 ◎flange type, sleeve type
 ◎with middle sleeve type, without middle sleeve type



中间轴承
 ◎滑动式、滚动式
 ◎单油楔型、多油楔型
 ◎多油楔型包括：
 带上轴瓦型
 无上轴瓦型

Middle bearing
 ◎rolling bearing, sliding bearing
 ◎single oil wedge, multi-oil wedges
 ◎multi-oil wedge includes:
 with upper bush type
 without upper bush type



艏密封
 ◎水润滑式、油润滑式
 ◎内置2、3、4道成型密封圈
 ◎后密封可选附件：
 防沙圈
 挡物环
 防渔网装置

Stern tube seal
 ◎water lub and oil lub
 ◎built-in 2,3,4 sealing rings
 ◎aft seal accessories (optional)
 sand prevention ring
 warding ring
 fishnet preventive device

艏轴
 ◎键联接式
 液压联接式
 法兰联接式
 ◎碳钢、合金钢、不锈钢

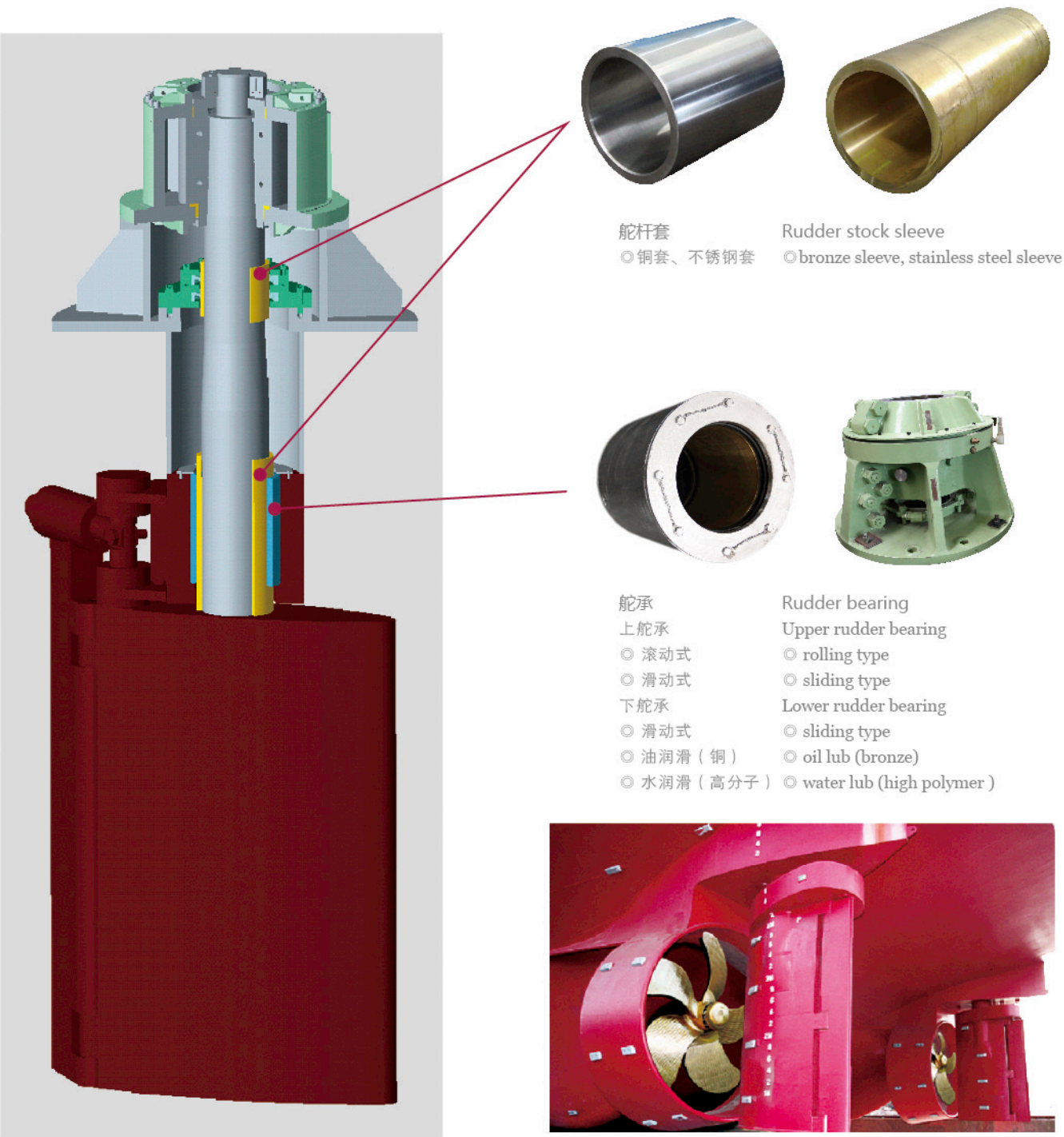
Tail shaft
 ◎key connection
 hydraulic connection
 flange connection
 ◎carbon steel, alloy steel, stainless steel



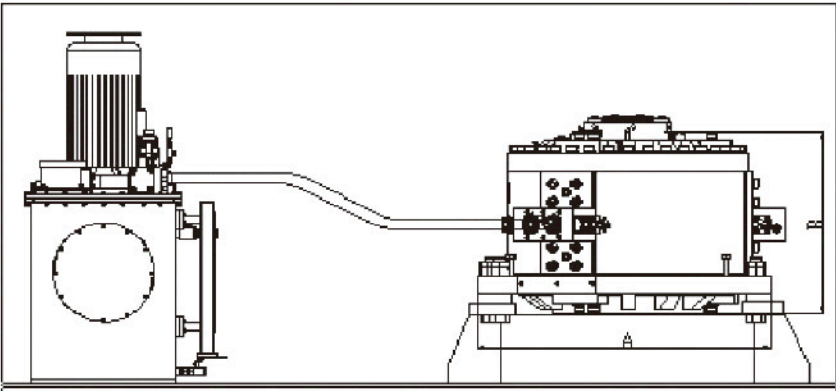
舵系部件
Rudder system components

NGC提供的铲型舵、襟翼舵、扭曲反应舵、导管舵能满足多种船舶对航速及操纵性的需要,可生产最大舵叶的重量为80T。NGC生产的电控转叶式液压舵机最大工作扭矩可达1600KN.m。

NGC's spade-type rudder, flap-type rudder, twisting reaction rudder and nozzle rudder can meet the requirement of speed and maneuverability of the vessels. The maximum weight of the rudder blade can reach to 80T. The maximum working torque of electric rotary vane type hydraulic steering gear of NGC reaches to 1600KN.m.



NRV系列转叶式
液压舵机
NRV series rotary vane
steering gear



型号 Model	工作扭矩 Working torque (KN.m)	最大舵杆直径 Max stock dia. (mm)	最大转舵角 Max rudder angle (deg)	尺寸 Dimension (mm)		重量 Weight (kg)
				A	B	
NRV12	120	220	2×65	940	680	1650
NRV16	160	240	2×65	1050	725	2000
NRV20	200	280	2×65	1050	750	2800
NRV25	250	300	2×65	1250	925	3000
NRV32	320	320	2×45	1250	925	3200
NRV40	400	350	2×45	1250	1045	3600
NRV50	500	370	2×45	1500	835	4000
NRV63	630	390	2×45	1500	935	5000
NRV80	800	420	2×45	1500	1015	6000
NRV100	1000	450	2×45	1700	1045	8000
NRV125	1250	470	2×45	1900	1195	9200
NRV160	1600	500	2×45	1900	1620	11000

以上图表的性能参数、规格尺寸和重量可根据用户需求作变动。
The data、dimension and weight could change according to client' s requirement.

- 主要特点：
- 结构紧凑，占地面积小，重量轻；
 - 舵角范围宽，最大转舵角度可达2×65°；
 - 内置自润滑舵承，可用作舵杆上舵承；
 - 机械效率高，容积效率高；
 - 与舵杆采用无键液压连接，安装方便；
 - 操作维护简单。
- Main characteristics:
- Compact, light, small;
 - Wide rudder angle range, max.steering angle is up to 2X65°;
 - Built-in self oiling rudder bearing, can be used as upper bearing of rudder stock;
 - High mechanical efficiency, high volume efficiency;
 - Keyless hydraulic connection with the rudder stock, easy to installation;
 - Friendly to operate and maintain.



生产检验 Process inspection

公司始终贯彻执行“质量第一、顾客至上、优质服务、诚信为本”的质量方针。
产品的设计、工艺的制定、材料的采购、成品的装配等所有过程均执行ISO9001质量体系标准、并满足相关船舶规范要求。
公司不断提高专业检验人员的技能、加大先进检验及试验设备的投入，确保产品符合标准要求。

Quality policy: quality first, users' utmost, leading the market and pursuing the perfect.
All of our processes, including designing, process, material and assembly are carried out under ISO9001 quality system, and can meet the requirements of Marine rules.
To ensure the quality of products, the company always regards the inspector's skills and increases the investment to the advanced inspecting and testing equipment.



钢板切割
Steel plate cutting



钢板卷制
Steel plate rolling



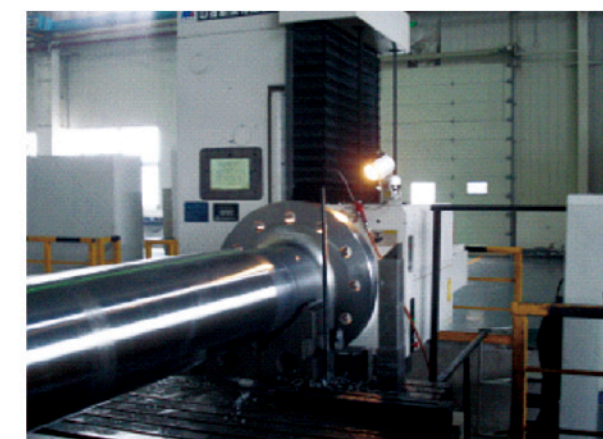
舵叶镗孔
Boring of rudder blade



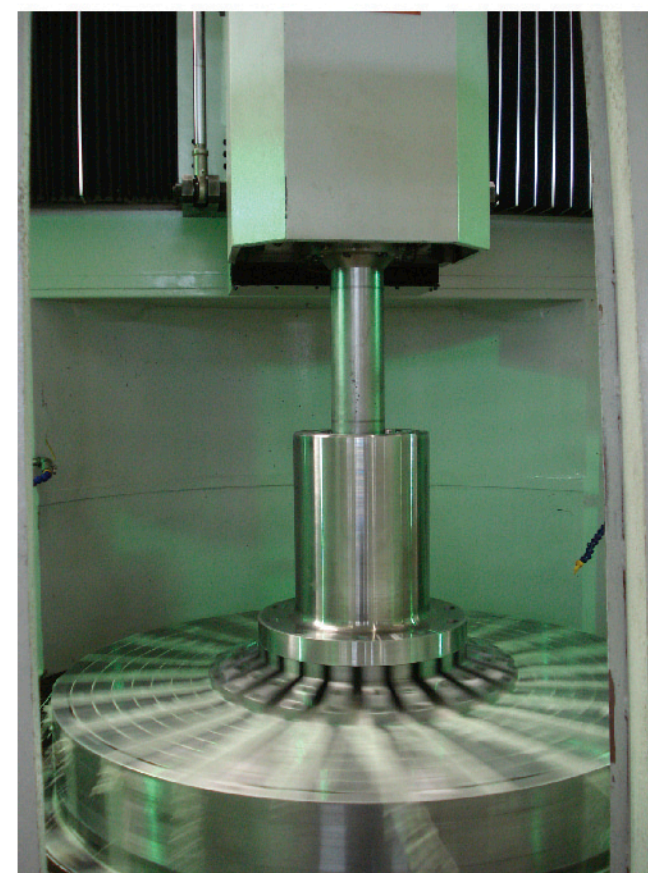
舵叶拂配
Rudder blade fitting



精加工长轴
Finish machining of long shaft



加工法兰孔
Flange hole machining



加工联轴节
Coupling machining



法兰孔配铰
Reaming of flange hole



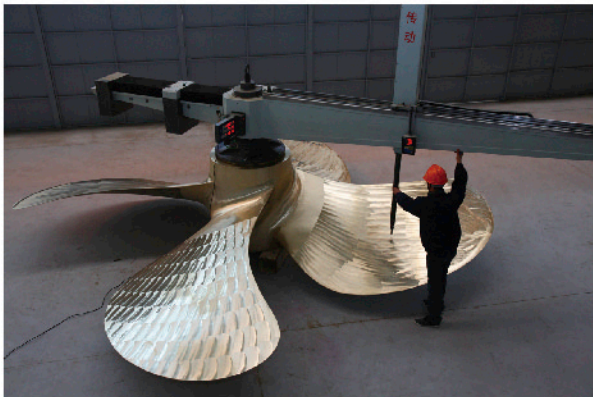
加工轴套
Shaft bush machining



轴套着色探伤
PT test to shaft bush



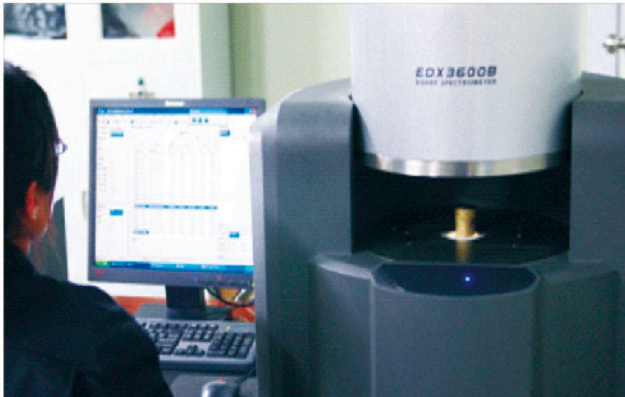
螺旋桨浇注
Propeller casting



螺距检测
Pitch test



桨轴拂配
Propeller shaft fitting



拉伸试验
Tension test

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