

GUANGZHOU • CHINA

# YUANHANG

PROPELLERS • 远 航 螺 旋 桨



## 远航螺旋桨制造有限公司

开平厂址：中国广东省开平市翠山湖新区环翠东路10号

电话：+86-750-2272888 +86-750-2277909

传真：+86-750-2277929

邮编：529300

广州办公室：中国广东省广州市番禺区市莲路新桥村段85号二梯3楼

电话：+86-20-34554888 +86-20-34554909

邮编：511450

YUANHANG PROPELLERS MANUFACTURING CO., LTD.

Factory Address: No. 10 Huancui East Road, Kaiping, Guangdong, China

Tel: +86-750-2272888 +86-750-2277909

FAX: +86-750-2277929

Postalcode: 529300

Guangzhou Office Address: 3rd Floor, No. 85 Xinqiao Village, Shilian Road, Panyu, Guangzhou, China

Tel: +86-20-34554888 +86-20-34554909

Postalcode: 511450

Email: [yuanhang@yhpropeller.com](mailto:yuanhang@yhpropeller.com)

[www.yhpropeller.com](http://www.yhpropeller.com)



远航螺旋桨制造有限公司  
YUANHANG PROPELLERS MANUFACTURING CO., LTD

# 远航 YUANHANG

承载着客户的期望与重负一路走来  
每一步都是如此的务实与严谨  
生产出世界一流品质的螺旋桨  
把“远航”这个响亮的名字带向世界  
让希望远航……  
远航万里 扬帆世界

Grow up with client's expectation and consignment  
Steps are so steadily and seriously  
Made out first-class quality propellers in the world  
To bring the pretty brand "Yuanhang" into the world  
Let our hope flies...  
Sailing far away and to sail all over the world

01

## 关于我们 ABOUT US

远航螺旋桨制造工厂建于1993年，经过多年来在制造工艺技术和设备投入的持续不断发展，已成为国内顶尖的螺旋桨制造厂家，可调螺距螺旋桨桨叶和桨毂的生产技术已达世界一流水平，生产能力已达单个螺旋桨成品重60吨。2012年7月，远航成功制造了一个直径8.4米、成品重量40吨、KR CLASS的螺旋桨。

Yuanhang was founded in 1993. Through all these years, by making continuous progress in manufacturing processes and equipment investments, Yuanhang has now become one of the top propeller manufacturers in China. Especially in the area of CPP blades and hubs, Yuanhang has achieved the world class quality. We are capable to manufacture propellers up to 60 tons in weight. In July 2012, Yuanhang succeeded in manufacturing a KR class giant propeller which is 8.4 meters in diameter and 40 tons in weight.

### Excellent Quality Worldwide Recognized 卓越品质 世界认证

多年来，远航人处处从严要求，不断进取，凭借优质的品质和服务，拥有了国际船级社协会10个成员的工厂认可。远航已拥有国际船级社协会成员工厂认可的有ABS、BV、DNV、KR、LR、NK、RINA、CCS、RS、IRS。

For many years, Yuanhang's staff have been making strict demand on ourselves and making ceaseless progress. With our high quality products and excellent service, Yuanhang has obtained factory approval certificates from 10 members of IACS, including ABS, BV, DNV, KR, LR, NK, RINA, CCS, RS and IRS.



## 远航主要轨迹 DEVELOPMENT PROCESS OF YUANHANG

### 1993

1993年6月 工厂正式建立。早期主要生产小型螺旋桨，产品供应本地市场。

In June 1993, Yuanhang was founded. In this early stage, we mainly offered small size propellers to the local market.

### 1999

1999年3月 远航首次有产品出口美国。远航自此起逐渐开拓海外市场。到2007年，远航已向二十多个国家出口产品。

In March 1999, Yuanhang began to export propellers to overseas. By 2007, we have offered propellers to more than twenty countries.

### 2001~2003

2001-2003年 远航先后取得多国船级社的工厂认可，包括中国CCS，法国BV，挪威DNV，美国ABS，英国LR，德国GL，日本NK，意大利RINA，韩国KR和俄罗斯RS。

During 2001-2003, Yuanhang obtained factory approval from Shipping Classification Societies one by another, including CCS, BV, DNV, ABS, LR, GL, NK, RINA, KR and RS.

### 2008~2012

2008年2月 成功交付了一个直径8米、重量30吨、ABS证书的螺旋桨。

2012年7月 远航成功制造了一个直径8.4米、成品重量40吨、KR CLASS的螺旋桨。

In February 2008, Yuanhang succeeded in delivering an ABS class propeller which is 8 meters in diameter and 30 tons in weight. In July 2012, another giant propeller that is 8.4 meters in diameter and 40 tons in weight has also been succeeded manufactured.

### 2015

2015年12月成功交付了单片主推可调桨桨叶直径为8.3米、重量为6.3吨及其配套的桨毂，成品重量为7.4吨项目。

In December 2015, Yuanhang succeeded in delivering a large project with CPP blades in diameter 8.3 meter with 6.3 tons and hub in 7.4 tons.

### 2019~2021

2019-2020年，远航于广东开平市建造新工厂，占地面积达45000m<sup>2</sup>，并于2021年9月完成工厂搬迁。2019-2020年，远航于广东开平市建造新工厂，占地面积达45,000 m<sup>2</sup>。整个工厂搬迁工作已于2021年9月完成。

### 1997

1997年9月 首次交付一只直径3米的螺旋桨，远航从此起迈向开拓和发展中大型螺旋桨市场。

In September 1997, Yuanhang succeeded in manufacturing a 3 meter propeller, which marked that Yuanhang began to enter into the medium propeller market.

### 2000

2000年11月 远航取得挪威DNV的IOS-9002质量体系认证。

In November 2000, Yuanhang got the ISO-9002 quality system certification from DNV.

### 2005

2005年8月 开始批量生产可调桨桨叶和桨毂，供应罗尔斯-罗伊斯、川崎、HRP以及肖特尔等客户。

In August 2005, Yuanhang began to batch manufacture CPP blades and hubs, supplying to Rolls-Royce Marine, Kawasaki Heavy Industries Ltd, HRP and Schottel.

### 2013~2014

2013-2014年 远航致力于节能产品的开发，并于2013年推出节能毂帽产品，已成功安装于数十艘船上，节能效果显著。

During 2013-2014, Yuanhang committed to develop energy saving products and in 2013, we launched an energy saving flow cap. By now, this cap has been putting into application in tens of vessels, verifying its great energy saving effect.

### 2016

从2016年起，远航致力开发提升不锈钢定距桨，可调桨桨叶以及桨毂，并成功取得ABS、BV、RS，以及DNV.GL的工厂认可。在铸件方面，致力于铜合金过滤壳体的开发、生产。

In September 1997, Yuanhang succeeded in manufacturing a 3 meter propeller, which marked that Yuanhang began to enter into the medium propeller market.

# 大型螺旋桨 GIANT PROPELLERS



◀ 客户正在检验一个直径8米的螺旋桨。  
Customers are inspecting an 8 meters propeller.



▶ 远航已取得ISO国际质量体系认证  
Yuanhang have obtained ISO certificate

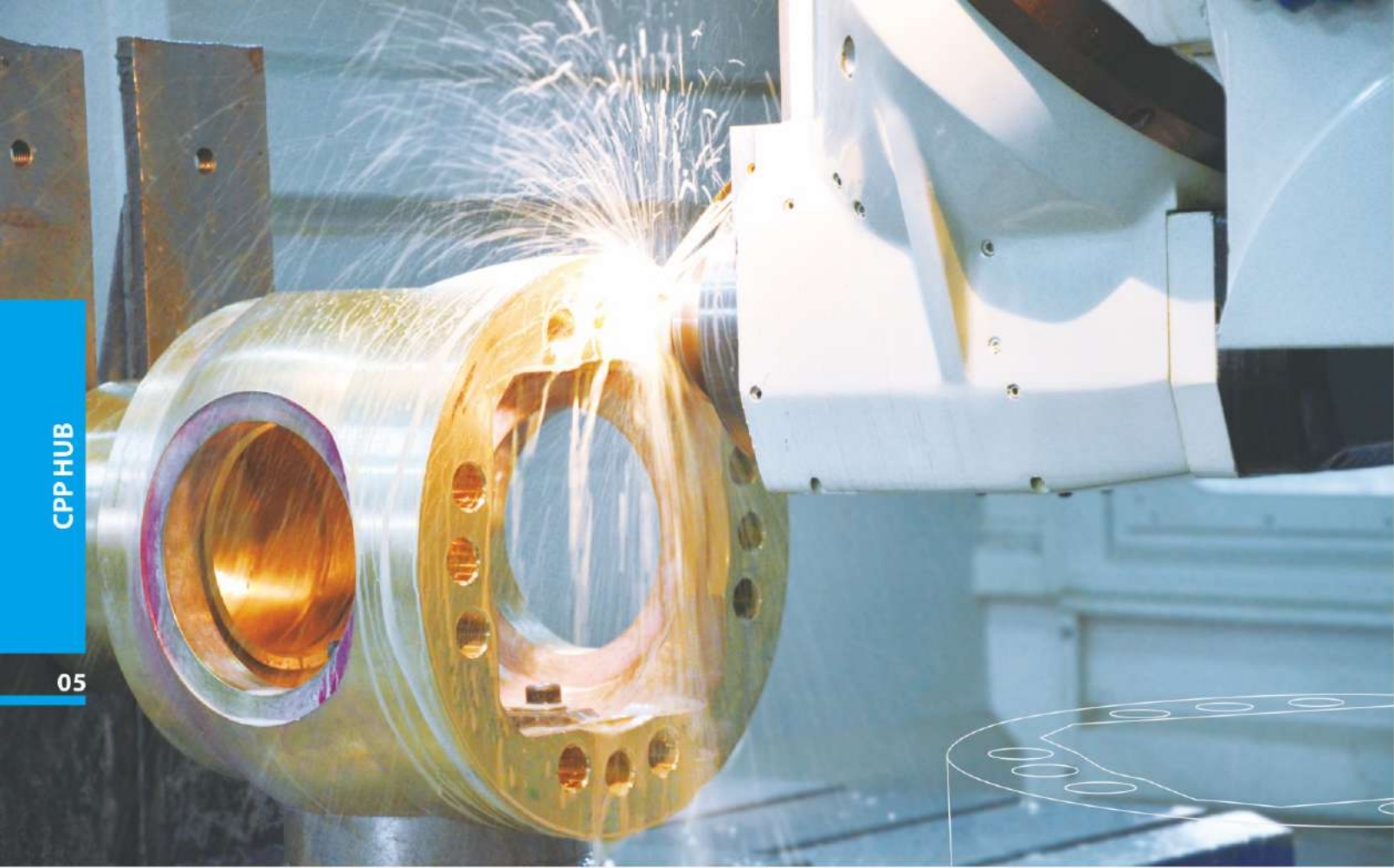
螺旋桨的叶面为复杂的曲面形状，其铸造工艺复杂、加工方法特殊，因而技术要求很高。尤其是大型铜合金螺旋桨的铸造，需要制造企业具备成熟的技术团队设计铸造工艺，预防各种铸造缺陷，并且配备先进的加工设备，来确保产品的加工质量。

远航于2008年成功交付直径达8米，重达30吨的螺旋桨，成功跻身国内超大型螺旋桨制造商之列，此后于2012年成功制造一只直径达8.4米，重达40吨的大型螺旋桨。

Because of its complex curve shape, propeller manufacture requires complicated casting technology and specialized processing methods, let alone giant propeller manufacture. To ensure the product quality of a giant propeller, manufacturer needs to have an experienced technical team and equipped with advanced equipment.

In 2008, Yuanhang succeeded in delivering an ABS class propeller which is 8 meters in diameter and 30 tons in weight, indicating Yuanhang has become one of the extra-large propeller manufacturers in China. Later in 2012, a more giant one that is 8.4 meters and 40 tons has also been successfully manufactured.





## 可调螺距螺旋桨毂 CONTROLLABLE PITCH PROPELLER HUBS

远航强大的桨毂加工能力建立在先进的设备基础上。远航持续从全球领先机床制造商引进的萨科曼万向加工中心及马扎克卧式加工中心，可满足客户严苛的产品加工要求。无论是铸造质量还是加工能力，远航制造的可调桨毂均可代表国内最高水平。

These few years, Yuanhang successively imported advanced milling centers from Sachman and Mazak for processing final machined hubs. Based on this, Yuanhang now has strong processing capability for hubs, fulfilling the high requirement of all our clients. In the hub manufacture area, with our excellent casting quality and superior machining power, Yuanhang stands out from other manufacturers in China.



## 可调螺距螺旋桨桨叶 CONTROLLABLE PITCH PROPELLER BLADES

远航运用铸造过程模拟软件将经验与实践相结合，制定铸造工艺方案。在加工方面，配套精密、高效的CNC设备，完全取缔人手打磨，确保产品质量，精度达到S级，代表着国内最高水平。

Through casting CAE system, Yuanhang combine experience with practice to design the best CPP blades casting technology. And in machining process, the use of CNC equipment rather than manual grinding can largely promote the accuracy and the efficiency. These help to ensure the quality of our products to reach the "S" class. "Made in Yuanhang" reflects the highest level in China.



## 中小型螺旋桨

### SMALL AND MEDIUM-SIZED PROPELLERS



普通螺旋桨  
Ordinary Propellers



高速客船桨  
High-speed  
Passenger Ship Propellers



半潜桨  
Surface Propellers



水翼桨  
Hovercraft Propellers

## 壳形螺旋桨

### SHELL-SHAPE PROPELLERS



壳型桨为远航与华南理工大学联合开发的螺旋桨，并于1999年取得国家专利（专利号：ZL99240826.1）。经上百艘渔船证实其系柱工况表现出高拖力，适用于对系柱工况要求高的拖网渔船、拖船。

远航对生产的每一个高速桨（转速高于500RPM）均做动平衡测试。

The shell-shape propeller is a propeller jointly developed by Yuanhang and South China University of technology, and obtained the national patent (Patent No.: ZL99240826.1) in 1999. It is proved by hundreds of fishing boats that its bollard working condition shows high pull, which is suitable for trawlers and tugs with high requirements for bollard working condition.

Yuanhang shall conduct dynamic balance test for each high-speed propeller produced (rotating speed higher than 500rpm).

## 轴系

### SHAFTINGS PRODUCTS

远航不但为客户提供螺旋桨，还为客户配套艉轴等轴系产品。Yuanhang can supply shafts as well as propellers to our customers.



## 铜合金铸件

### DIFFERENT KINDS OF COOPER ALLOY CASTING PRODUCTS

除铜合金螺旋桨，远航还致力于铜合金过滤壳体、泵体、工艺品等开发及生产。

Yuanhang is dedicated to developing and manufacturing the bronze castings of BWMS filter body, pump body, and different kinds of casting artworks.





## 不锈钢系列 STAINLESS STEEL PRODUCTS



为满足客户的需求，远航不但致力于铜合金类产品的生产，从2016年起，致力开发提升不锈钢产品，推出不锈钢系列产品，包括螺旋桨、水轮机铸件、水泵铸件等，生产单件成品重量最大可达12吨。

此外，2021年新购进不锈钢热处理炉，有效处理尺寸达5m\*5m\*2.5m，可满足大型不锈钢铸件的热处理需求。

The shell-shape propeller is a propeller jointly developed by Yuanhang and South China University of technology, and obtained the national patent (Patent No.: ZL99240826.1) in 1999. It is proved by hundreds of fishing boats that its bollard working condition shows high pull, which is suitable for trawlers and tugs with high requirements for bollard working condition.

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## 节能装置 ENERGY SAVING DEVICE

### 节能毂帽 Energy Saving Flow Cap

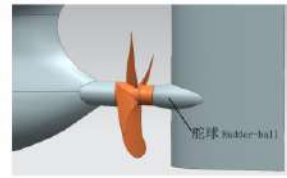
节能毂帽是在普通导流帽的基础上，增加与螺旋桨叶数相等的鳍叶，以消除毂涡，减小主机的扭矩，达到节能的目的。远航为首家在国内大力推广节能毂帽的企业，并申请其专利（专利号：ZL 2012 2 0206313.9）。

Energy saving flow cap is to add fins equal to the number of propeller blades on the basis of ordinary cap, so as to eliminate hub vortex, reduce the torque of main engine and achieve the purpose of energy saving. YUANHANG is the first enterprise to vigorously promote energy saving flow cap in China and applied for its patent (Patent No.: ZL 2012 2 0206313.9).



### 舵球 Rudder-ball

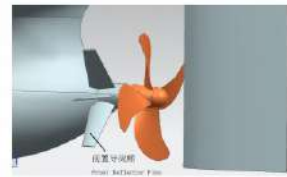
舵球为一焊接在舵上、回转轴与桨轴重合的回转体，填充毂涡低压区，抑制尾流收缩，从而提高螺旋桨效率，一定程度改善船尾振动。节能效果1%-2%。



The rudder-ball is a rotating body welded on the rudder and the rotating shaft coincides with the propeller shaft. It fills the low-pressure area of the hub vortex and inhibits the contraction of the wake, so as to improve the propeller efficiency and improve the stern vibration to a certain extent. Energy saving effect 1% - 2%.

### 前置导流鳍 Front Deflector Fins

前置导流鳍为桨前焊接在船艏上的鳍，其通过产生与螺旋桨转向相反的预旋流，减小桨后水流的旋转能量损失，以此达到节能的目的。船尾肥大船节能效果有望达4%以上。

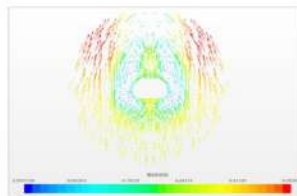
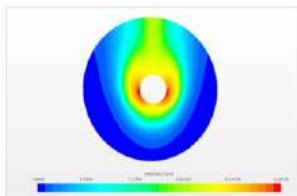


The front deflector fins are fins welded on the stern in front of the propeller, which reduce the rotational energy loss of the water flow behind the propeller by generating a pre swirl opposite to the propeller steering, so as to achieve the purpose of energy saving. The energy-saving effect of fat stern ship is expected to reach more than 4%.

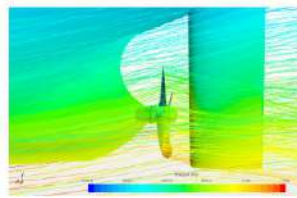
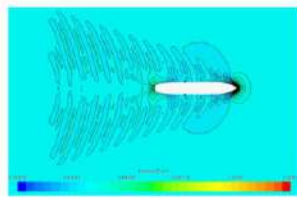
## 流体力学计算技术 COMPUTATIONAL FLUID DYNAMICS

远航多年来一直致力于研究CFD技术，并不断取得新突破。YUANHANG has been committed to the research of CFD technology for many years and has made new breakthroughs.

### 伴流场计算 Calculation of Wake Field



### 船舶性能计算 Ship Performance Calculation



### 螺旋桨性能计算 Propeller Performance Calculation

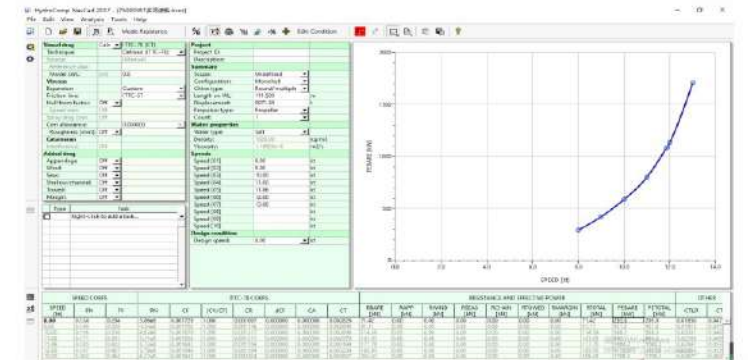


## 螺旋桨设计 PROPELLER DESIGN

### 船舶阻力 Ship Resistance

远航采用母型船数据估算（引进NavCad软件，涵盖绝大多数母型船数据）和CFD分别计算船舶阻力，相互校核。

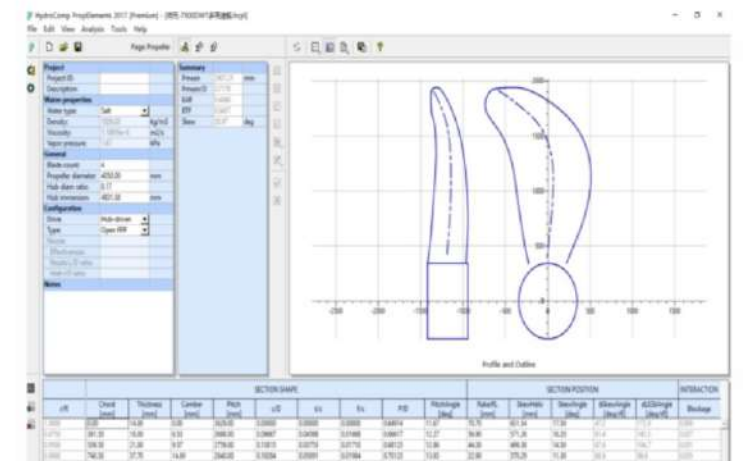
YUANHANG use the data estimation of mother ship (NavCad software is introduced to cover the vast majority of mother ship data) and CFD to calculate the ship resistance respectively and check each other.



### 螺旋桨设计优化 Propeller design optimization

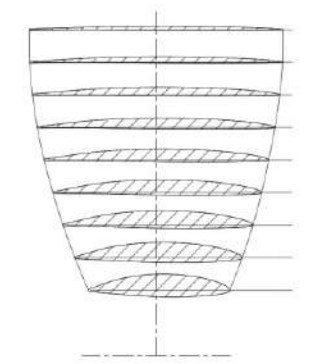
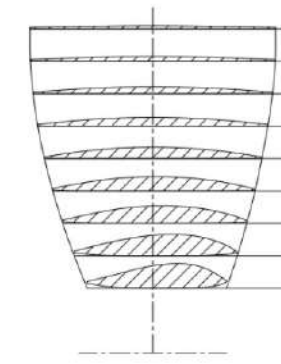
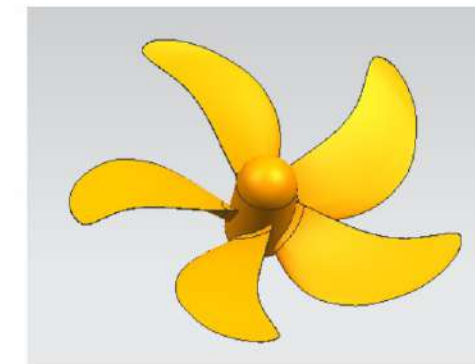
在图谱设计经验的基础上，远航引进螺旋桨设计软件PropElements，能设计各种侧斜、螺距、拱度分布的螺旋桨，预报空泡水平，校核强度。软件计算结果由CFD校核。

Based on the experience of atlas design, YUANHANG purchased propeller design software PropElements, which can design all kinds of propellers with skew, pitch and camber distribution, predict cavitation level and check strength. The software calculation results are checked by CFD.



在设计过程中，形成一系列与不同船体、主机相匹配的高效桨、导管桨。

In the design process, a series of high-efficiency propellers and ducted propellers matching with different ships and main engines are formed.





## 技术精良 科研领先

### CONSUMMATE TECHNOLOGY FORERUNNER OF R&D

#### 研发

一艘效率高的船，必然有一个设计性能卓越而匹配的螺旋桨。远航为不同的船只设计相匹配的螺旋桨，力求使船的性能（航速）更显优胜。远航的设计已得到广大用户，特别是马来西亚和中国江浙地区用户的认可，远航设计也因此享有盛名。远航还与高等院校合作开发与研制高速高效率螺旋桨，其中的“壳形螺旋桨”于1999年11月取得国家专利（专利号：NO.ZL99 240826.1）。在节能减排方面，2013年远航成功获得国家实用新型专利（专利号NO.ZL2012 2 0206313.9）——带有鳍叶的节能型螺旋桨毂帽。

#### R&D

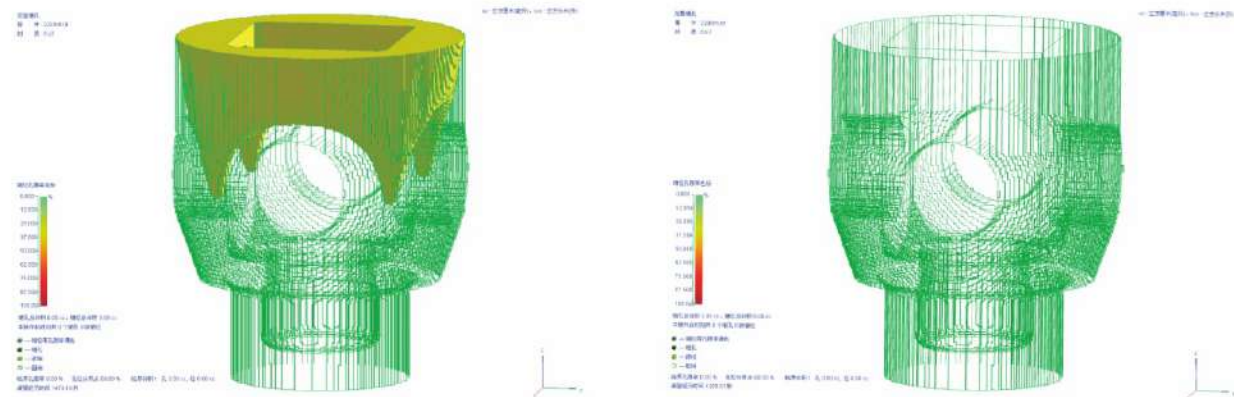
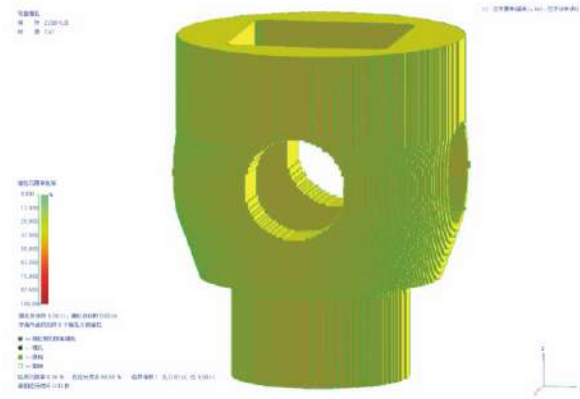
An excellent and high efficient ship do must have a matching and well performing propeller. Thus, Yuanhang commit ourselves to design individualized and matching propellers for different ships, tries to help ships have a better performance. Through our hard work, our design has been acknowledged by the consumers, especially our clients in Malaysia, Zhejiang and Jiangsu Province in China. Besides, Yuanhang is eager to cooperate with universities in developing better propellers. The shell-shape propeller has got the Country Patent in 1999 (Certificate No. ZL 99 240826.1).

#### 铸造过程模拟

铸造CAE是为评价和优化铸造产品与铸造工艺而开发的专业CAE系统，借助于铸造CAE系统，铸造工程师在完成铸造工艺编制之前，就能够对铸件在形成过程中的流场、温度场和应力场进行仿真分析并预测铸件的质量，以便能进一步修正铸造设备参数和优化工艺方案。

#### CASTING PROCESS SIMULATION

Casting CAE is a system specially designed for evaluating and optimizing casting technology in order to have higher casting quality products. With this system, foundry engineers can do simulation analysis for the flow field, temperature field and stress field during the casting solidification process and have a forecast of the casting quality, so as to revise the parameters of the casting equipment and optimize the casting technology.



## 加工设备

### MACHINING EQUIPMENT

远航持续从ABB、SACHMAN、MAZARK等全球领先机床制造商引进各种加工设备，用以加工不同规格的螺旋桨产品，保证产品质量能满足客户的严格要求。

Yuanhang successively imports all kinds of advanced equipment from ABB, Sachman, Mazak and other world leading machine manufacturers to process different products, in order to meet strict demands of our clients.



萨克曼万向加工中心  
Sachman Five-axis Milling Center

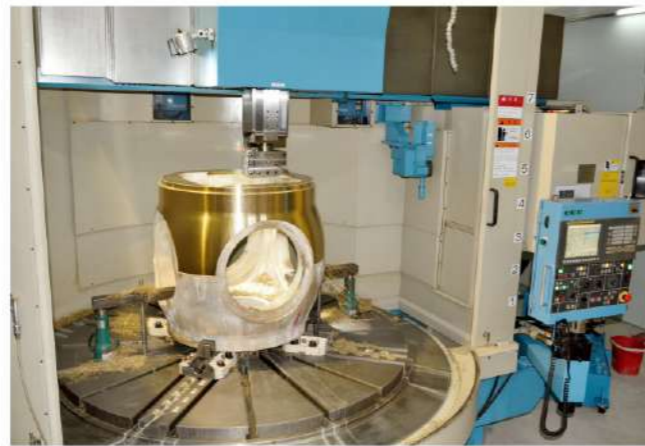




马扎克卧式加工中心  
Mazak Milling Center



数控卧式镗铣加工中心  
Horizontal Milling and Boring Machining Center



数控立式车铣复合加工中心  
O-M Turning and Milling Center





数控动梁式龙门铣  
Milling Planer



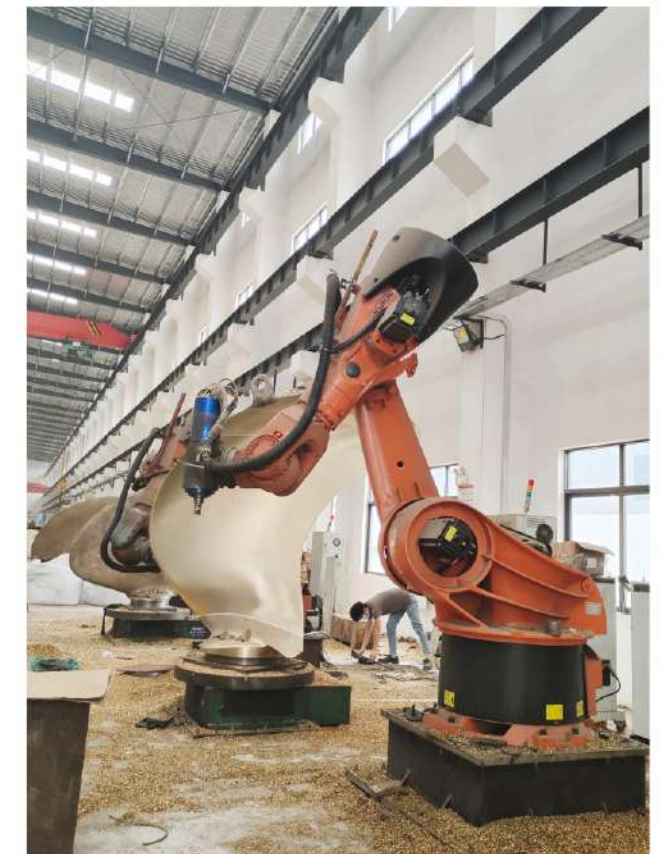
CNC龙门加工中心  
Vertical Gantry Machining Center



库卡机械手  
KUKA Robot

引进的库卡机器人通过计算机程序控制的机械手来代替人工研磨/抛光螺旋桨叶片，极大地提高了螺旋桨叶片的加工精度，降低劳动强度。远航对该机械手研磨/抛光技术的运用是船用螺旋桨制造行业在中国的先驱。

Replacing the traditional manual grinding by using computer controlled Kuka robot can largely improve the precision of the grinding work. This robotic grinding technology is a pioneer in marine propeller manufacturing industry in China.



# 检测设备 INSPECTION EQUIPMENT

远航除配备常规检测设备外，还配备了精密的、特殊的先进设备，如3D测量仪、大型动平衡机（可为直径5米、重量10吨以内的螺旋桨提供动平衡测试）CMM，可满足高端客户的需求。

Besides conventional inspection equipment, Yuanhang also have some high class equipment, such as portable 3D measurement tool, large dynamic balancing machine (can do dynamic test for propellers up to 5 meters in diameter and 10 tons in weight) CMM. These equipment can fulfill our clients' high requirements.

3D测量系统  
Portable 3D  
measurement system



浮动式静平衡机  
Floaing Static Balancing  
Machine

大型动平衡机  
Large Dynamic  
Balancing Machine





三坐标测量机  
CMM

行程范围: X=2000mm Y=3000mm Z=1500mm, 可以满足高端客户对大型产品的检测需求。  
With inspection range X=2000mm Y=3000mm Z=1500mm, it can fulfill our clients' high inspection demands of large size products.



光谱仪  
Spectrograph



拉伸机  
Tensile Machine

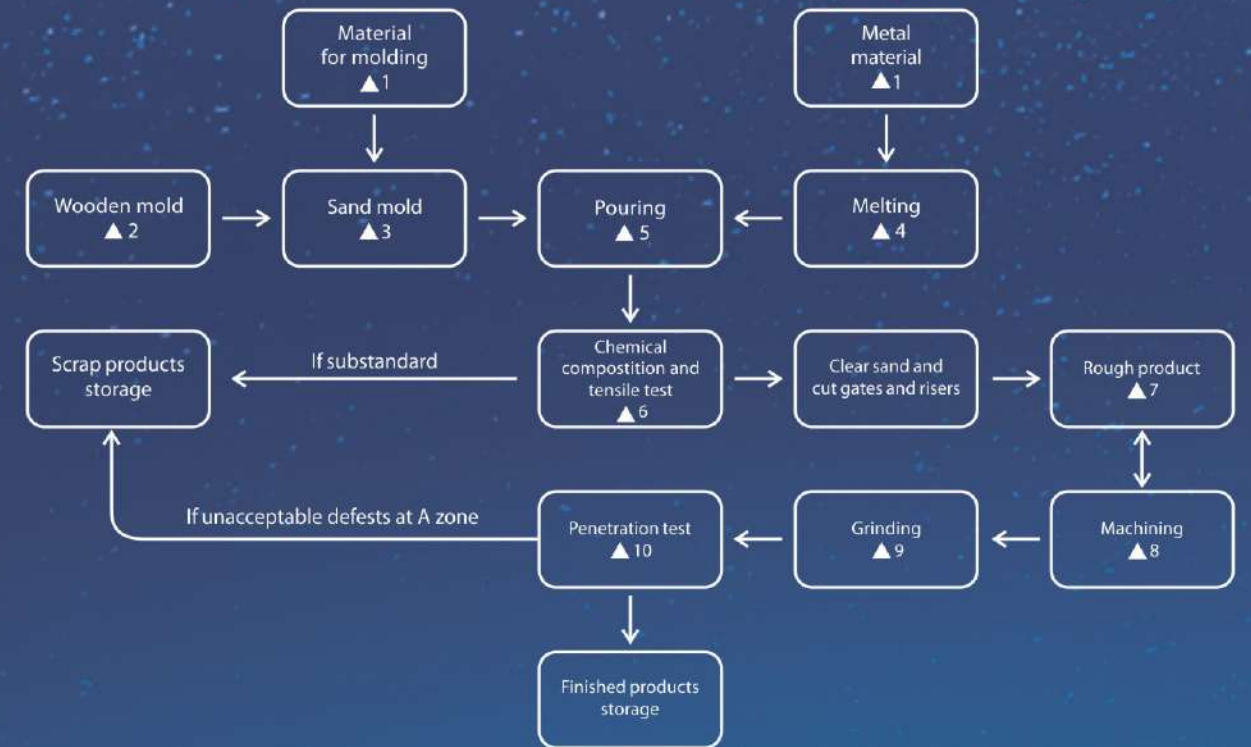


金相分析仪  
Metallographic Examination  
Instrument

## 严格检验 质量保证 STRICT INSPECTION QUALITY GUARANTEE

远航人精益求精, 拥有专业的设计团队和雄厚的生产实力, 为世界的船只生产出性能卓越而匹配的螺旋桨。

Yuanhang's staff never stops pursuing better products. With our professional design team and our powerful manufacturing ability, we can and never stop offering matching and good performance propellers for ships all over the world.



- 远航通过了法国BV的质量体系ISO9001认证。  
Our quality management is according to ISO 9001 and certified by the Bureau Veritas

- 质控点  
产品每一个生产工序都有严密的质量控制, 产品将按客户要求领取船级社产品证书。  
Each production procedure will be controlled by a quality control group within our company. The products can have classification society certificates on customer's request.



## 市场 SELLING

远航设计并制造集装箱船、货船、油船、拖船、拖网渔船等等船只的各类型螺旋桨，产品享誉中外，在欧洲（芬兰、挪威、英国、德国、意大利、西班牙、荷兰）、日本、美国、加拿大、中东（阿联酋、科威特、伊拉克）、东南亚、澳大利亚、南美等多个国家和地区，深受客户推崇。

Yuanhang designs and manufactures all kinds of propellers for each kind of ships, including container ships, cargo ships, oil tankers, tug boats, trawlers. Our products are well-known home and abroad, greatly welcomed in Europe (Finland, Norway, UK, Germany, Italy, Spain, Holland), Japan, USA, Canada, Middle East (U.A.E, Kuwait, Iraq), Southeast Asia, Australia, South America and so on.

## 生产能力 PRODUCTION CAPACITY

远航的主要产品是定距桨和可调螺距螺旋桨叶及桨毂。远航生产能力已达单个螺旋桨成品重60吨，单个可调桨毂重20吨的水平。

Yuanhang mainly offers fixed pitch propellers, controllable pitch propeller blades and hubs. We are capable to manufacture fix pitch propellers up to 60 tons in weight and CPP hubs up to 20 tons.