

**海南海控特玻科技有限公司**  
HAINAN HOLDINGS SPECIAL GLASS TECHNOLOGY CO.,LTD.



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**合作共赢·成就客户·成就品牌**  
win-win cooperation, satisfy customer, achieve brand





- Established by relying on the core team of Luoyang float technology, HNHT is affiliated with the State owned Assets Supervision and Administration Commission of Hainan Province and is located on Hainan Island, a beautiful tropical island in China.
- We specialize in providing one-stop services for flat glass manufacturers, including factory construction for turnkey projects, production operation services, product research and development, and testing.
- We have built various turnkey projects and projects for glass manufacturers, including engineering planning, engineering design, procurement, construction, engineering management, start-up and put into production.
- We have provided effective glass defect solutions for multiple operating glass manufacturers.
- Engineering and service projects are spread across various glass fields, including float glass, pattern glass, sheet glass, etc.
- We rely on our technical advantages and rich experience in the fields of design, construction, and production operations to continuously provide glass manufacturers with the most advanced technology and products, and collaborating with multiple internationally renowned glass companies (PPG, DTEC, Pilkington, Saint-Gobain)



R&D



Turnkey



Production technology services

We provide full process service for glass manufacturers!

## Introduction of Team Leader



DR. Jiang Hong

- Winner of First Prize of National Science and Technology Progress Award
- Enjoy the "State Council Special Allowance"
- Director of the National Key Laboratory of Special Glass
- First batch selected for the national "New Century Millions of Talents Project"
- Winner of the Guanghua Engineering Science and Tech Award from the Chinese Academy of Engineering

## State Science and Technology Awards

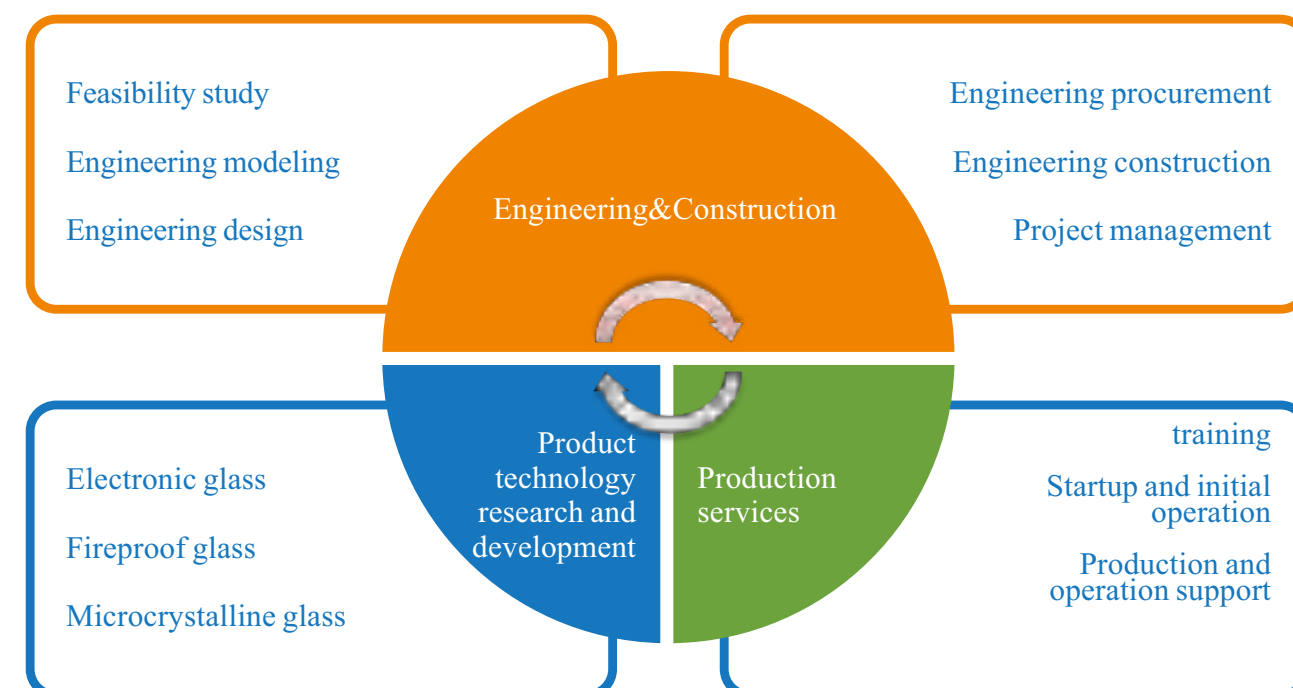
——Our country issues this award to reward our special contributions in ultra-thin float glass technology and equipment.



## Honorary Certificates and Patents

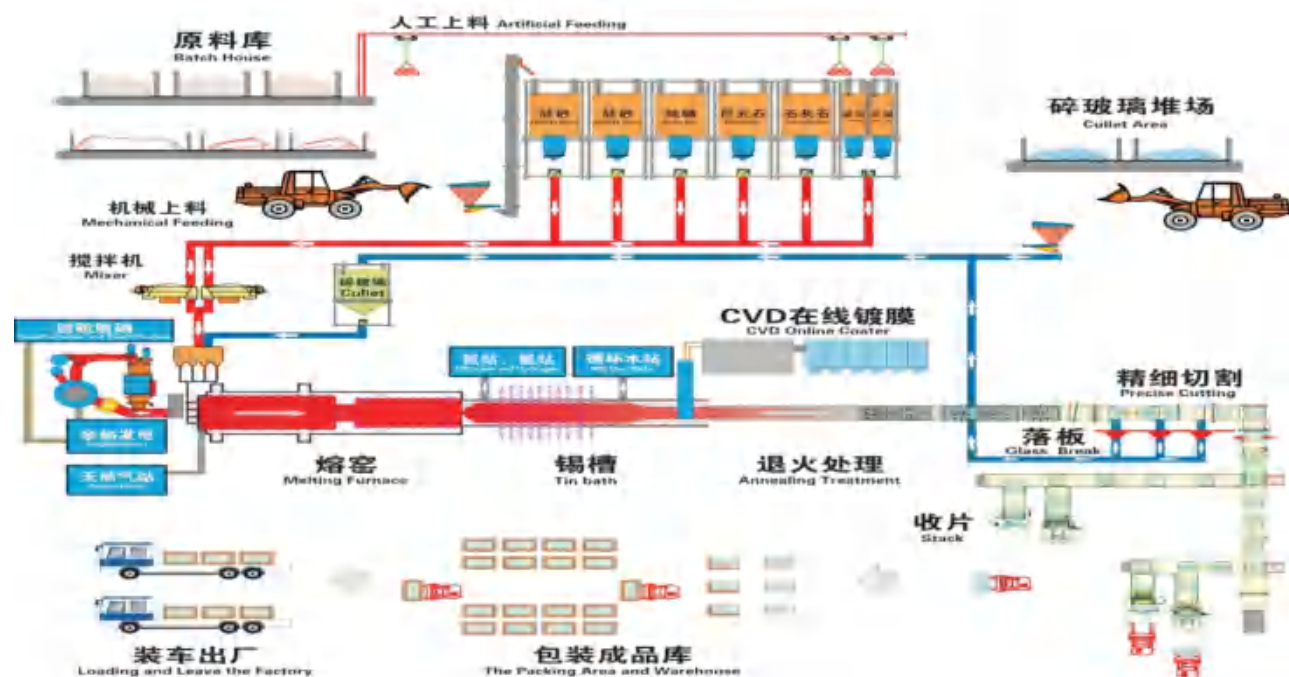


## Main business





- » **Business purpose:** To provide one-stop services for glass manufacturers, covering every stage for project planning, construction, production and operation support

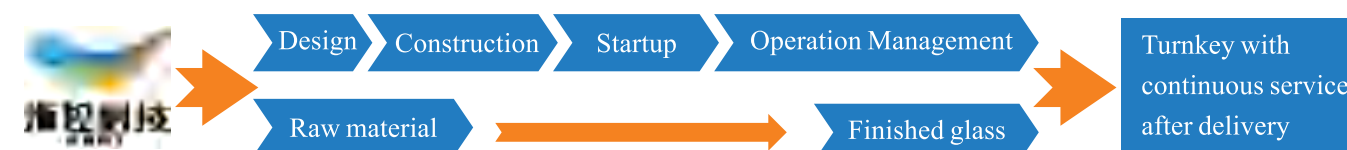


- » **Our partners**



- » **Engineering and services**

- » **Projects undertaken:** New construction, cold and hot repair projects for production lines of 50 t/d to 1200 t/d float glass, sheet glass, pattern glass (solar glass), special glass, etc
- » **Delivery mode:** turnkey project, regional general contracting, engineering design, installation guidance and quality supervision, training and production services





## Engineering&Construction



Raw material



Melting



Finished product

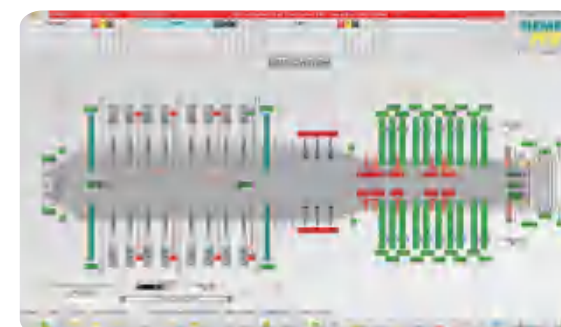
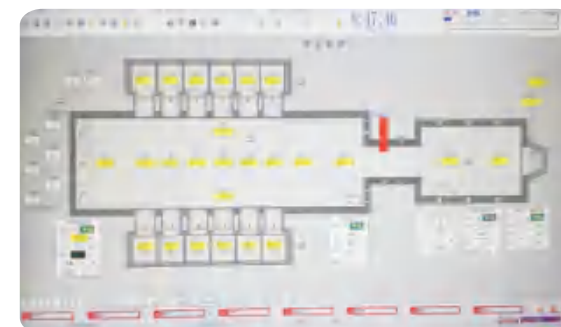


Forming



Annealing

## DCS Hot End Control System



## On site technical training





## » Production technical services

- » HNHT has knowledge and skills of all types of glass furnace and process line operation, from raw material selection to packaging (including float glass, pattern glass, sheet glass, etc.)
- » HNHT has the ability to solve any glass defects and develop separate solutions for each specific problem. This troubleshooting helps glass manufacturers improve production efficiency.
- » Here is a list of services that HNHT is capable of providing:
  - ◆ 1.Training, including classroom training and on-site training.
  - ◆ 2.Glass production lines Start-up and initial operation.
  - ◆ 3.HNHT experts conduct inspections and evaluations of current equipment and operations, and provide optimization suggestions based on the situation, covering the entire production process from raw materials to finished glass.
  - ◆ 4.Optimize current production operations, increase the yield and quality of glass products, and reduce energy consumption.
  - ◆ 5.Sources and solutions of defects in glass products
  - ◆ 6.Provide operational guidelines and specific recommendations for the production of glass of different colors and ultra white glass.
  - ◆ 7.Provide operational guidelines and specific recommendations for the production of ultra-thin electronic glass and ultra-thick glass.
  - ◆ 8.Furnace hot repair: maintenance of sidewalls, checker changes, replacement of lip bricks and flow channels, etc



## » Production technical services

### » Furnace and tin bath

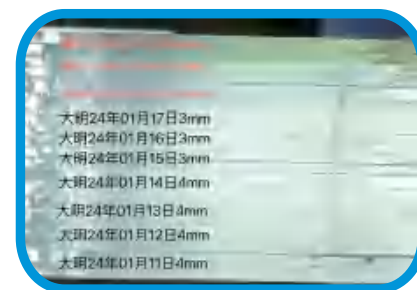
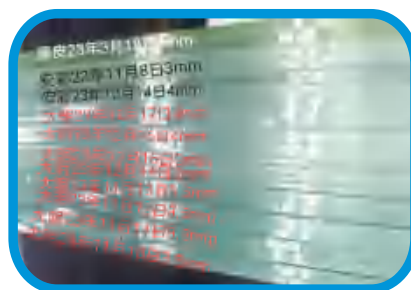
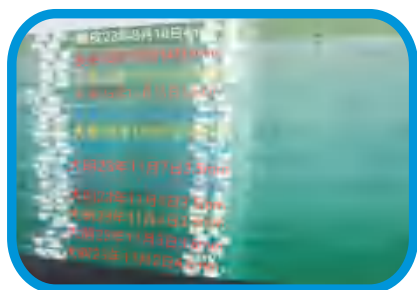




## Production technical services

- Provide technology for converting ordinary float glass to ultra white glass

No	Thickness mm	VLT (380-780nm)	Solar transmittance (300-2500nm)	Mirror reflectivity %	Fe <sub>2</sub> O <sub>3</sub> %	Redox	Tin penetration ug/cm2	Lower surface Fe <sub>2</sub> O <sub>3</sub> ppm
1	4	90.1	86.45	N/A	0.0745	0.26		
2	4	90.87	89.93	94.36	0.008	0.44	36	150
3	4	91.24	90.54	94.76	0.008	0.31	33	428
4	4	91.27	90.93	94.85	0.008	0.3	31	276



## Production technical services

- Provide technology for converting the ordinary float glass to colored glass

Color	Thickness mm	Tvis (%)	Tuv (%)	L*	a*	b*	Fe <sub>2</sub> O <sub>3</sub> (%)	FeO (%)	Redox
F Green	5	77.13	27.76	90.38	-7.32	0.89	0.626	0.158	0.25
Colorless	5	89.66	69.28	95.86	-1.19	0.22	0.067	0.023	0.34
Dark Blue	5	41.44	19.31	70.48	-13.16	-14.2	0.966	0.267	0.28



Colorless



F Green



Dark Blue

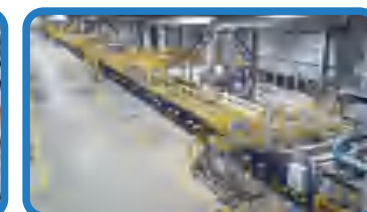
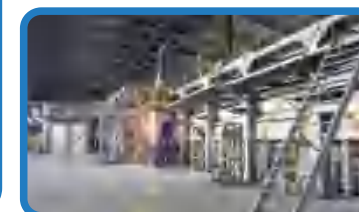
## Typical cases 1

- In 2005, the first 600 t/d high-quality float glass production line was constructed in North Africa, the products are sold to Europe.
- This project has been awarded as the Outstanding Contribution Award for China -Algeria Cooperation. The entire project adopts an EPC cooperation model, and we provide comprehensive and long-term technical support, which has been appreciated and recognized by the owner.



## Typical cases 2

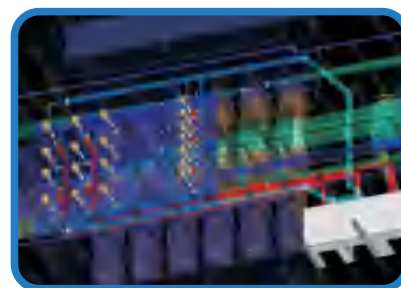
- Algeria MFG800 t/d high-quality float line, put into operation in 2016. The products are sold to Europe.
- Collaborate with the Saint Gobain technical team.





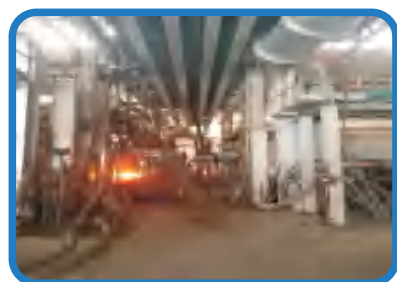
## Typical cases 3

- Design and Engineering General Contract for Cold Repair and Upgrading of MFG600 t/d Float Glass Line, The product quality meets European quality standards and is sold to Europe.
- Collaborate with the Saint Gobain technical team.
- Production time: 2022
- Product thickness: 1.6-19mm.



## Typical cases 4

- Cold Repair Technical Renovation of Taiwan Glass 450T/D Float Glass Production Line (Pilkington Technology)
- Production time: 2023
- Product thickness: 1.3~12mm



## Typical cases 5

- Russia ООО «Экспо Гласс» company Sheet Glass Line - Helping Owners Solve Problems in Glass Production
- Technical Services - Solving Bubble Defects
- Technical Services - Increase Production, Increase Glass Thickness and Varieties
- Successfully met the contractual requirements.



## Typical cases 6

- Hainan (AVIC) Special Glass Materials Co.,Ltd 700t/d Ultra White Glass Production Line
- Production time: 2015
- Product thickness: 1.6~19mm



World Record: 3300×21000mm Glass Original Sheet



## Typical cases 7

### Guiyang Jiaxing New Materials Co., Ltd. 600T/D Float Line

- ◆ The product quality meets the Chinese float glass standard, the yield rate reaches 90%.
- ◆ Production time: 2020
- ◆ Product thickness: 1.8~12mm



## Typical cases 8

### Upgrade and Renovation Project of Yihai Glass Float Glass Line

- ◆ Production time: 2019
- ◆ Product thickness: 1.3~12mm



## Scientific research and glass testing

- ◆ We have a national glass laboratory with the most advanced glass research and testing equipment.





## Scientific research and glass testing

Strain point annealing point tester



Field emission SEM



X Fluorescence spectrometer



Plasma emission spectrometer



X-ray diffractometer



laser particle size analyzer



Infrared spectrometer



## Scientific research and glass testing

Softening point tester



Thermal expansion coefficient tester



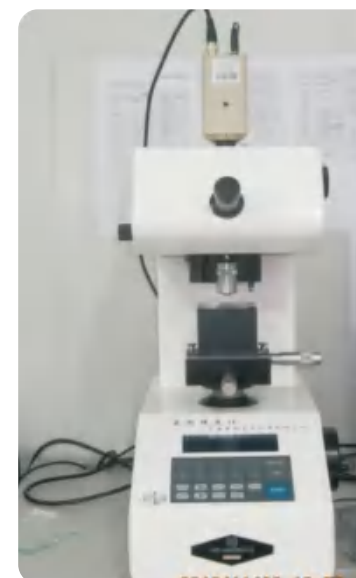
Universal testing machine



physical simulation device  
for melting of furnace



microhardness tester



High temperature  
rotational viscometer





## 1. Furnace equipment

### a) L-shaped suspending backwall equipment for doghouse

Suspending backwall equipment includes: L-shaped suspending backwall, curtain, and sealing device.

- The doghouse suspending backwall equipment has excellent structural stability, can perfectly seal the doghouse, improve the melting rate of the furnace, reduce flying materials, and decrease heat loss. It is a commonly used equipment for high-quality glass furnace.



### b) Furnace neck suspending backwall

It can effectively divide the melting section and the working end, stabilize the pressure in the working end, and ensure the quality of the glass.

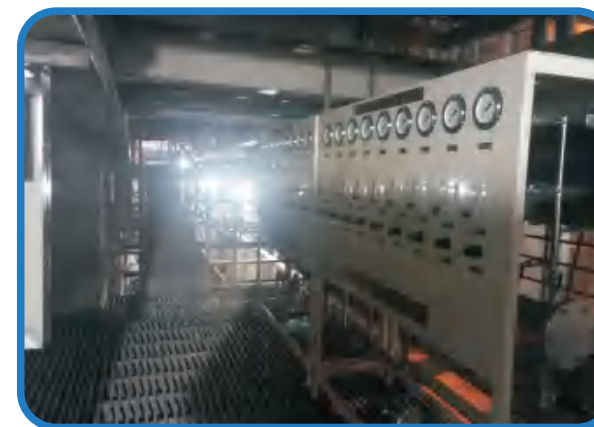
There are several forms of furnace neck suspending backwall:

- Neck T-shaped suspending backwall
- Neck J-shaped suspending backwall
- Neck suspending flat arch

### c) Water cooled bubbler

- Working principle: Installed at the bottom of the melting section, insert the bubbling tube into the glass liquid.
- Main function: to improve the heat transfer efficiency of glass liquid; Improve yield and quality; Extend the furnace age; Reduce color-transfer loss.

Provide two forms of installation in the furnace: cold installation and hot installation.



## 2. Tin bath equipment

### a) Tin bath space cooler

- Working principle: Installed on the upper part of the glass liquid in the tin bath to control the temperature of the glass liquid. According to its specific installation position, it is divided into head cooler and exit cooler.

Equipment features: Suspended structure, back and forth of water cooler are driven by motors or manual work, equipped with switches for temperature and flow and with alarm devices, used for water interruption and high water temperature monitoring. All signals can be remotely transmitted to DCS.







### ➤ b) Tin liquid cooler

- ◆ Directly installed on the side wall of the tin bath. The head of the cooling tube is directly inserted in tin liquid. The tin cooler extracts heat from tin liquid, so that tin liquid can in turn absorb heat from glass.



### ➤ c) Flags

- ◆ Installed under the tin liquid on both sides of the tin bath, usually in pairs, it can effectively control the convection of the tin liquid, thereby improve the quality and yield of the glass surface. The HNHT flag can be adjusted to various specific depths in tin liquid and installation positions.
- ◆ No need for water cooling, fast installation, and convenient adjustment.

There are usually two types of flag according to different conditions:

Submerged flags

Full-depth flag

