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镀膜生产线
Coating Line



NorthGlass Company Profile

Luoyang North Glass Technology Co., Ltd., simply called as "North-Glass", was established by Mr. Gao Xueming, Chairman of the board, in Luoyang National High & New Technology Development Zone on 18th, May, 1995. In 2011, North-Glass created a precedent in glass deep processing machine industry, going public at Shenzhen Stock Exchange (stock code: 002613). Today, NorthGlass has developed into a high-tech industry group integrating in R&D, manufacturing, sales and service with continuous innovation capability, composed by 5 bases respectively in Luoyang, Shanghai, Tianjin, Beijing and Guangdong.

Adhering to the enterprise spirit of "Innovating forever, Striving for success", NorthGlass independently developed her main products of glass tempering furnace, coating line and upscale processed glass as the core competitiveness. Furthermore, NorthGlass has also expanded her product series with general fans and HVLS industrial fans, glass processing automation system, glass storage system, glass cutting machine, cutting-breaking-grinding-drilling automation line, screen printing machine, automotive glass pre-processing line, etc., up to now more than 300 product models in total.

NorthGlass is one of the strongest and leading manufacturers and technology R&D enterprises in the field of glass deep-processing machinery industry. The annual sales of major product, flat/bent glass tempering furnace, is ranking stable forefront of the worldwide industry within last 17 years since 2002 when the sale amount of furnaces exceeded 100 sets. Accumulatively more than 4400 NorthGlass glass tempering furnaces are running around the world. The coating line developed and produced by NorthGlass is becoming one of the global leading suppliers in glass coating industry and led to a rapid development of coated glass business in China.

Another mainstay product for North-Glass is upscale deep-processed glass, which has been widely applied in a lot of famous architectural projects all over the world, for example "Sun Valley" & "Shiliupu Pier" of EXPO 2010 Shanghai, "Bird Nest" & "Water Cube" of Olympic Games 2008 Beijing, China National Center for the performance arts, New Beijing South Railway Station, Beijing Capital International Airport (Phase III), Shanghai Tower, Abu Dhabi International Airport, Singapore Changi Airport, Vietnam APEC Exhibition Center, main venue of Xiamen BRICS summit, main venue of SCO summit, Deqing forum place of UN Global Geographic Information Management, LA Oceanwide Plaza, US Oracle Headquarters, Leadenhall Building in London, etc.

Meanwhile, NorthGlass is also one of two qualified architectural glass suppliers for the most famous electronics company in the world, for its dozens of retail stores in the world as well as new Headquarters Building in Silicon Valley of USA.

NorthGlass's products have been sold in whole China, moreover exported to more than 100 countries and regions in the world, such as USA, UK, Germany, France, Switzerland, Russia, Japan, India, Brazil, Argentina, Saudi Arabia, Egypt, Turkey, etc., covering all continents of Asia, Europe, North America, South America, Africa, Oceania, etc., via NorthGlass's complete domestic and international

sales and service network.

NorthGlass has more than 20 sets of advanced production testing lines and labs, obtaining the certifications of ISO9001, 3C, CE, UL, etc., and has applied and owned more than 100 patents. NorthGlass is awarded as "the Top Hundred Enterprises of Henan", "the Meritorious Enterprise of Henan" and "the Meritorious Enterprise of Luoyang". In July 2017, "NorthGlass" was recognized as one of China Famous Trademarks in China. The Chairman of NorthGlass Board, Mr. Gao Xueming, was also awarded as "the Representatives of the 30 years of reform and opening up of the national building materials industry".

NorthGlass History

In 1994, NorthGlass produced the first Made-in-China "Horizontal Roller Hearth Flat/Bent Glass Tempering Furnace".

In 1999, a wholly owned subsidiary "Beijing North Glass Safety Glass Co., Ltd." was established.

In 2005, a holding subsidiary "Shanghai North Glass Technology Industrial Co., Ltd." was established.

In 2008, a wholly-owned subsidiary "Shanghai North Glass Coating Technology Industrial Co., Ltd." was established, by which North Glass took on the mission of filling the blank of domestic commercial coating lines.

In 2009, the most famous electronics company in the world decided to build their Asian flagship retail store in Shanghai, and therefore started the cooperation with NorthGlass of supplying high quality architectural glass for totally 77 stores up to now.

In 2011, NorthGlass went public at Shenzhen Stock Exchange, simply called as "NorthGlass Corp." with stock code 002613.

In 2012, a holding subsidiary "Tianjin North Glass Industrial Technical Co., Ltd." was established with a total investment of 500 million RMB, which rapidly becomes one of the worldwide high quality architectural glass suppliers.

In 2015, NorthGlass merged Shenzhen Juisun and Dongguan Byronic to a new holding joint venture subsidiary "Guangdong North Glass Juisun Glass Technology Industrial Co., Ltd.", which expands NorthGlass product scope into the fields of glass screen printing machine and cutting-breaking-grinding-drilling automation line.

In 2015, NorthGlass celebrated the 20th Anniversary and changed the new LOGO.

In 2016, NorthGlass launched the industrial fund "NorthGlass Fund" together with Lianxun Capital, established a new company "Beijing North Glass SiNest Technology Co., Ltd.", and took the first step into the field of environmentally-friendly building materials for prefabricated house.

In 2017, a holding subsidiary "Guangdong North Glass Electronic Glass Co., Ltd." was established, which expands NorthGlass product scope into the field of electronics glass industry.

In 2018, a holding subsidiary "Beijing North Glass Curtain Wall Technology Co., Ltd." was established, which focus on the R&D, sales and service of high quality architectural glass.

In 1995, "Luoyang North Glass Technology Co., Ltd." was established.

In 2004, NorthGlass developed the new generation glass tempering furnace with "Super Flat & Spotless" technology, which changed the old knowledge that tempered glass must have inherent defects of recognizable iridescence and distortion and brought a new quality concept to worldwide tempered glass industry.

In 2007, a holding subsidiary "Luoyang NorthGlass Taixin Fan Technology Ltd." was established, which expands NorthGlass product scope into fan industry.

In 2008, the first Low-E glass coating line independently developed by Shanghai North Glass Coating Technology Co., Ltd. was put into commercial production, which filled the blank of Chinese Low-E coating lines with commercial production.

In 2010, NorthGlass successfully developed the first super-large bent glass tempering furnace, which can produce the bent tempered glass with size up to 18 meters height and 3.6 meters bent edge. This furnace pushes the world's glass tempering technology to a new high level.

In 2014, as NorthGlass subsidiary, Tianjin NorthGlass Industrial Technical Co., Ltd. signed the contract with the most famous electronics company in the world, to provide the special architecture structural glass to their new headquarters office building.

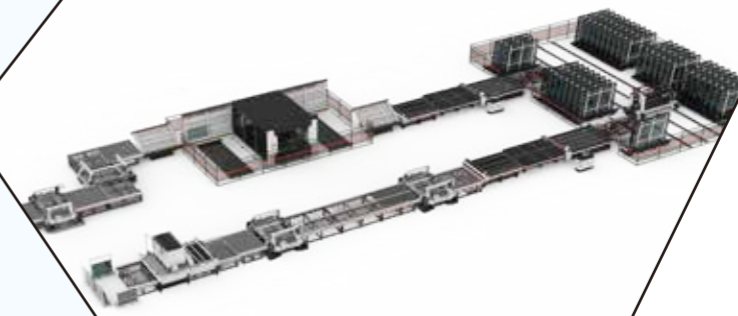
In 2015, a holding subsidiary "Shanghai North Glass Automation Technology Co., Ltd." was established, which opens a new chapter of Industry 4.0 in glass deep processing industry in China.

In 2016, Luoyang NorthGlass Fan Corporation firstly adopted the advanced Tri-Variate Movement Theory into the design of centrifugal fan, successfully completed the task of providing the transformer cooling fan to China's latest Renaissance EMU high speed trains with own national standard.

In 2017, NorthGlass successfully developed the bent glass tempering furnace to produce super-large size cylindrical tempered glass with arc length up to 8m and height up to 4m, as well as the full convection flat tempering furnace to produce flat tempered glass with glass length up to 20m, which provide broader design space to the architects.

In 2018, a holding subsidiary "Zhuhai North Glass Electronic Glass Co., Ltd." was established, which focus on the R&D and production of large-size touch screen panel glass.

◀ Processed Glass

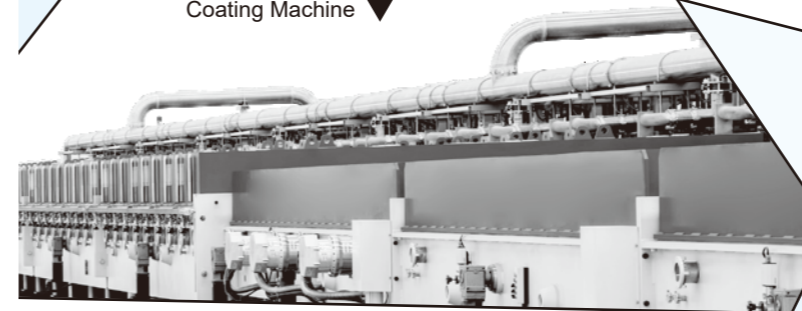


Glass Automation System ▲

Glass Tempering Furnace ▼



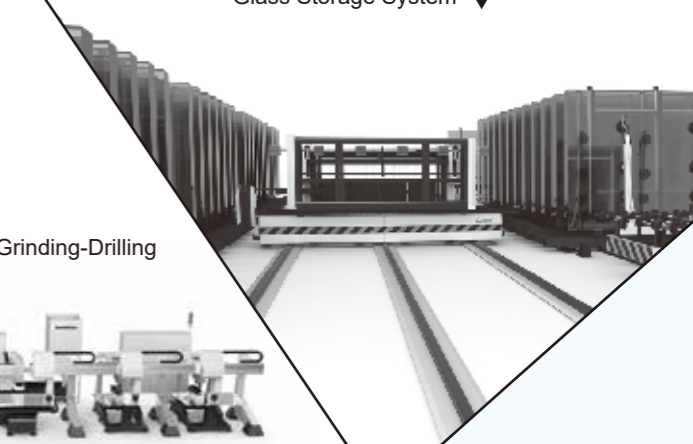
Coating Machine ▼



Glass Cutting Machine ▼



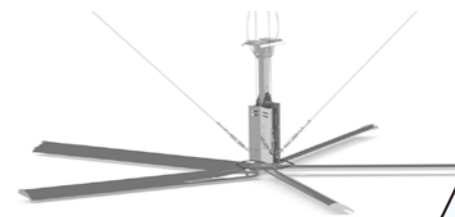
Glass Storage System ▼



▼ Cutting-Breaking-Grinding-Drilling Automation Line



HVLS Fan ▼



General Fan ▼



▲ Glass Screen Printing Line



Five Bases

Luoyang NorthGlass

Full name of "Luoyang North Glass Technology Co., Ltd.", the headquarters and parent company of NorthGlass

Tempering Furnace Business Unit

with main products of flat and bent glass tempering furnaces. Cumulatively over 4400 furnaces have been sold to more than 100 countries and regions all over the world since 1995. In 2010, a flat/bent tempering furnace was developed to produce super-oversized tempered glass with the size of 3.6 x 18 m for the headquarters of the most famous electronics company in the world. All furnaces are classified into three series to meet different customer needs: Top series, Advanced series and Basic series.

Luoyang Glass Business Unit

Main products include Low-E coated glass, "Super Flat & Spotless" tempered glass, curved tempered glass with super-long arc length, SGP laminated glass, screen printed glass, etc. It has the most complete kit factory in Middle West regions with the strongest processing capability of high quality architectural glass. Supplying oversized curtain wall glass for well-known landmark buildings, such as Xi'an Twin Towers, China Railway Center-of Xi'an, etc..

Luoyang North Glass Fan Technology Co., Ltd.

Main products include general fan, high-speed train cooling fan, convection hot fan, motor sweeper fan, HVLS fan, etc.. Tri-Variate Movement centrifugal fan was designed to be in line with Chinese national standard as transformer cooling fan for high-speed train.



Shanghai NorthGlass, full name of "Shanghai North Glass Technology Industrial Co., Ltd." **Shanghai North Glass Coating Technology Industrial Co., Ltd.**, is a specialized vacuum coating equipment manufacturer with rich experience in large surface vacuum coating technology, focus on the R&D, manufacture and service of large surface vacuum coating lines, special coating equipment for automotive glass and display panel, sputtering cathode and its core components (end block, magnet bar). **Shanghai Coated Glass Business Unit**, is a company mainly engaged in the production of oversized coated glass.

Shanghai North Glass Automation Technology Co., Ltd., engaged in R&D and manufacture of glass storage, cutting, grinding, cleaning and complete automation solutions for glass processing factory. **Shanghai Glass Business Unit**, with NorthGlass' s strong support of R&D and equipment manufacturing capabilities, using NorthGlass' s new generation tempering furnaces to produce different types of special glass, such as irregular shape glass, dual curvature glass, convex curved glass, ultra-wide glass, super thick glass, etc. Its main projects includes Shanghai Tower skirt building, Shanghai Disney Tomorrowland, etc.. **Shanghai Equipment Manufacturing Business Unit**, is a comprehensive manufacturing center equipped with various types of manufacturing machines for multiple processes of riveting, welding and machining.



Tianjin NorthGlass, full name " Tianjin North Glass Industrial Technical Co., Ltd." With a total investment RMB 500 million and production plant area 100' 000 sqm, Tianjin NorthGlass is a new glass deep-processing enterprise owning advanced technologies and professional R&D team, who is becoming one of the world' s specialist suppliers of super oversized tempered, laminated, insulated, digital printed glass with top level quality. Their representative projects include the headquarters and dozens of stores of the most famous electronics company in the world, National Bank of Kuwait, etc.. Tianjin NorthGlass' s all production equipments, such as Low-E coating line, flat/bent glass tempering furnaces, CNC work center, laminating line, insulating line, etc., are able to produce super-oversized curtain wall glass and structural glass with the length of 18m.

Beijing NorthGlass, full name " Beijing North Glass Curtain Wall Technology Co., Ltd. " formerly called as " Beijing North Glass Safety Glass Co., Ltd.", is currently a company dedicated in marketing, customer service and technology development and research.



Guangdong NorthGlass

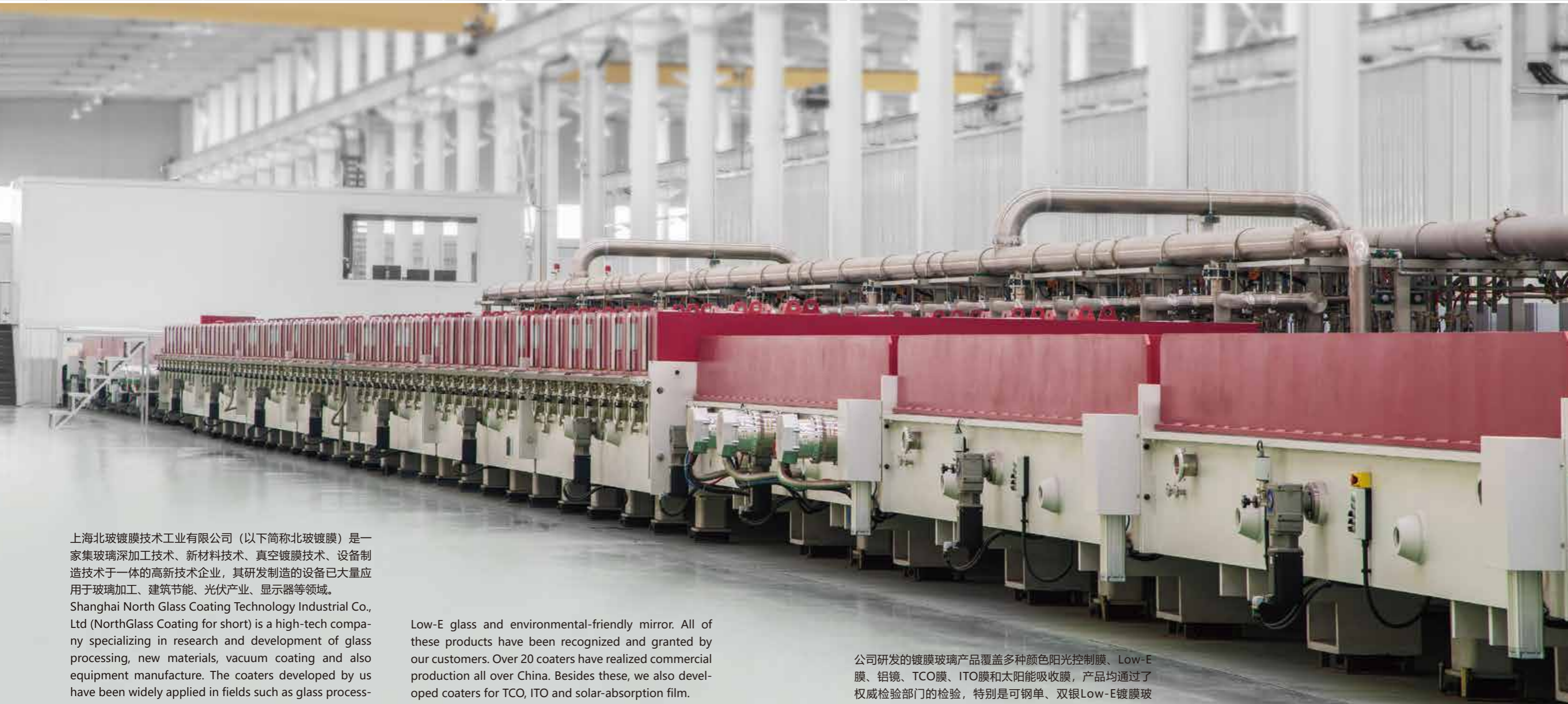
Guangdong NorthGlass and Juisun Technolgy Industry Co., Ltd. with main products of glass screen printing line and automatic production line integrated with functions of cutting, breaking, grinding and drilling. Bringing together the superior resources of NorthGlass and Juisun, Guangdong North Glass is committed to building the first-class Chinese pre-processing equipment for automotive and industrial glass industries.

Guangdong North Glass Electronic Glass Co., Ltd. Main products include panel glass for tablet PC, laptop, automotive display, smart furniture, etc. These products have been applied in electronic products of HP, Lenovo, Huawei, Samsung, etc..

Zhuhai North Glass Electronic Glass Co., Ltd. a subsidiary wholly-owned by Guangdong North Glass Electronic Glass Co., Ltd., with main products of touch screen glass for educational services, interactive whiteboard, multimedia blackboard, LCD advertising player, etc.. Currently these products have been applied in electronic products of Seewo, HiteVision, Hisense, Smart, Promethean, etc..

公司简介

COMPANY PROFILE



上海北玻镀膜技术工业有限公司（以下简称北玻镀膜）是一家集玻璃深加工技术、新材料技术、真空镀膜技术、设备制造技术于一体的高新技术企业，其研发制造的设备已大量应用于玻璃加工、建筑节能、光伏产业、显示器等领域。

Shanghai North Glass Coating Technology Industrial Co., Ltd (NorthGlass Coating for short) is a high-tech company specializing in research and development of glass processing, new materials, vacuum coating and also equipment manufacture. The coaters developed by us have been widely applied in fields such as glass processing, building energy efficiency, PV industry and display .

北玻镀膜凭借雄厚的研发实力和加工制造能力，先后开发出大面积Low-E玻璃生产线、汽车挡风玻璃镀膜生产线和环保制镜线。上述设备得到用户广泛认同，已有超过二十条生产线在各地实现商业化生产。除此之外，公司还开发出了TCO、ITO和太阳能吸收膜等镀膜设备。

With strong R & D and manufacturing capability, North-Glass Coating has successfully developed the coaters for processing large area Low-E glass, auto windshields

Low-E glass and environmental-friendly mirror. All of these products have been recognized and granted by our customers. Over 20 coaters have realized commercial production all over China. Besides these, we also developed coaters for TCO, ITO and solar-absorption film.

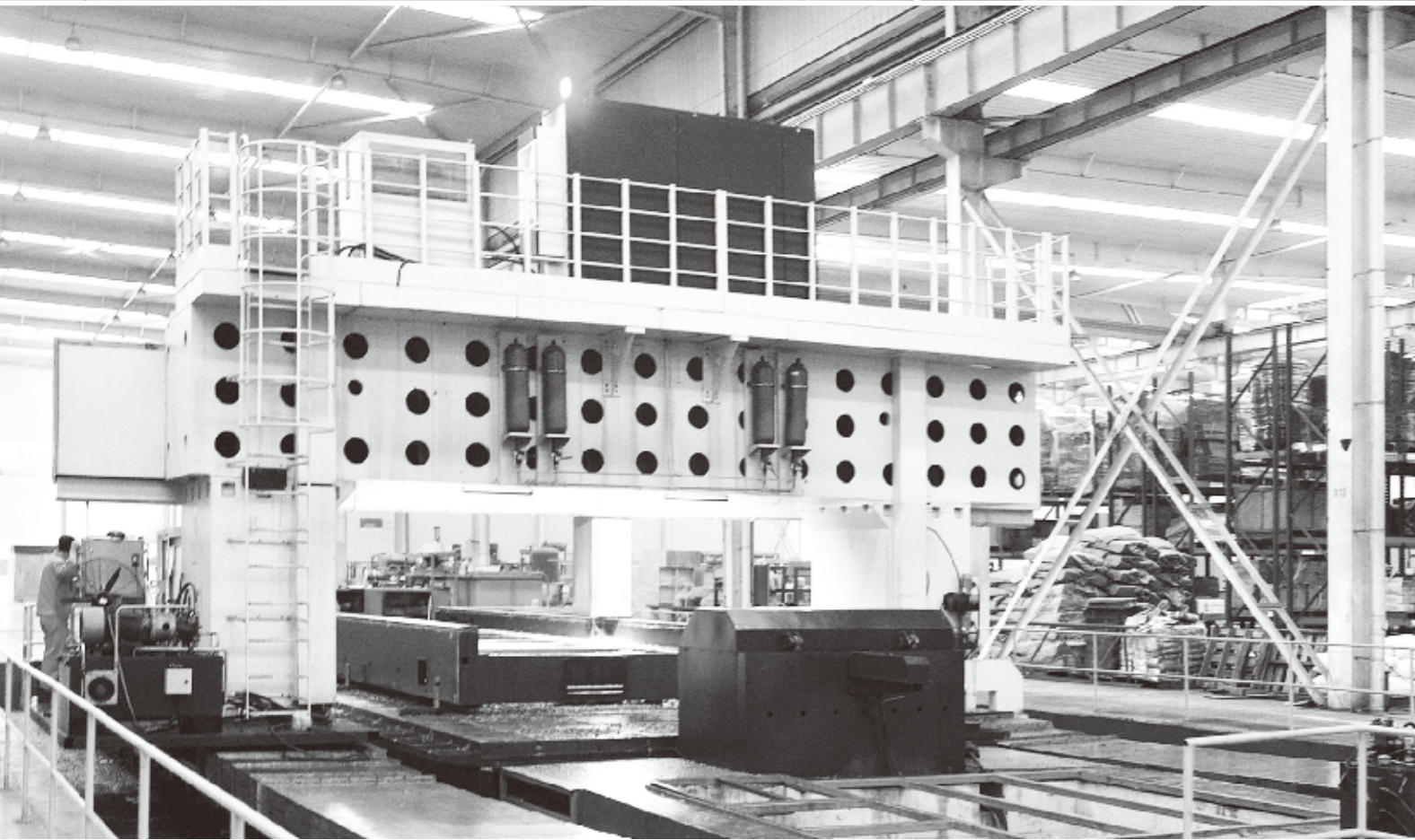
北玻镀膜投资超过3亿元人民币在上海和洛阳建立研发和制造基地，是专业的真空镀膜设备供应商。目前公司有200多名专业人员从事镀膜技术研发和设备生产。

NorthGlass Coating has invested more than RMB 300 million Yuan in establishing R&D and manufacturing bases in Shanghai and Luoyang, and it is the professional vacuum coater supplier. At present, we have more than 200 employees engaging in coating technology and coater manufacturing.

公司研发的镀膜玻璃产品覆盖多种颜色阳光控制膜、Low-E膜、铝镜、TCO膜、ITO膜和太阳能吸收膜，产品均通过了权威检验部门的检验，特别是可钢化、双银Low-E镀膜玻璃，一经推出便引起业内的轰动。公司根据不同工艺的实现需要，提供C系列和S系列镀膜设备；公司还可以为客户进行镀膜设备和膜系的个性化开发，设备升级改造，溅射器件（阴极、端头、磁棒等）的替换、保养和维护等。

Coated glasses developed by NorthGlass Coating cover colored solar-control, Low-E, Al mirror, TCO, ITO, and solar-absorption film. All these have passed the tests of authority inspection departments . Especially upon the introduction of the temperable single and double Ag

Low-E glass, it created a great sensation in the industry. Based on different processing needs, we can offer C series and S series coaters; further on, we are able to carry out customerized design of coater and layer stack, machine upgrading, replacement and maintenance of sputtering devices (cathode, end block, magnet bar and etc.) in accordance with clients' requests.



- 拥有大型高精度加工设备，为整线制造与集成提供雄厚的加工实力，确保设备制造和最终设备集成的总体质量。
By equipping large high-precision machines and CNCs, there is a strong machining capability to ensure the manufacture and integration quality of components.
- 使用Ansys和Solidworks对结构在各种外载荷条件下的受力、变形稳定性及各种动力特性做出全面分析，从力学计算，组合分析等方面提出全面解决方案。
Ansys and Solidworks are used to analyze the stress, deformation and various dynamic characteristics of the structure under external load conditions. Comprehensive solutions are obtained through mechanical calculations, combination analysis and etc.
- 自主研发的三维空间磁场测量分析系统，用于磁钢阵列空间气隙场分布的测定及磁钢的安装、调整，为阴极研发提供有效的技术手段。
The device of 3D magnet test gives an effective method for measurement and adjustment of magnetic intensity distribution of target surface.

- 采用真空磁控溅射技术，沉积效率高，基片温度低，膜层质量高，可重复性好。
Vacuum magnetron sputtering technology is applied, leading to fast deposition rate, low substrate temperature, as well as high coating quality and good repeatability.
- 新型磁棒采用新型的铝型材支撑结构、可调节式磁钢阵列、更均匀的靶材冷却，膜层均匀性极佳。
New magnet bar leads to excellent film uniformity through new support structure from extruded aluminum, adjustable magnet array and more homogeneous target cooling over length.
- 提供辅助工艺气体系统（如3、5、7或9段），提高真空环境工艺气体分布均匀性，提高膜层均匀性。
Trim process gas system (e.g. 3, 5, 7 or 9-partioned) is equipped, which improves distribution uniformity of process gas and coating uniformity as well.
- 气体隔离装置的创新设计，有效避免了不同井位之间的气体漂移，气体隔离效果好。
New design of the gas separation device avoids gas drifting between cathode compartments and achieves better gas separation effect.
- 采用先进的干泵和磁浮分子泵配置，杜绝工艺室返油污染，运行更加可靠、高效。
By using maglev turbo-molecular pumps and screw line pumps, no oil will flow back into the process zone and the process will be more reliable and efficient.



- 采用同步电机或伺服电机控制，实现传输的高精度控制。
By adopting synchronous or servo motors, high precision conveying control can be achieved.
- 具有多种控制和操作方式，操作者可以根据需要灵活的操作生产线，完成对产品的生产调整和产品的自动生产。
There are multiple control and operation modes for users to choose in coating process. The coater can be easily operated on the basis of process requirements. Once the production data are defined, the coater will be in operation automatically.
- 提供实时动态监测，对设备的故障进行报警提示，保障设备和产品生产的安全可靠。
Real-time dynamic monitoring can alarm faults or malfunctions of machine to ensure the safety and reliability of the production.



- 可互换等隔舱设计，客户可随意调整泵位、气体隔离位和阴极位，提高工艺灵活性。
The identical design of vacuum compartments enables users to change the location of the pump, gas separation and cathode compartments freely, thus to improve process flexibility.
- 真空腔室的模块化设计，提高腔室加工效率，提高重大部件的加工质量和互换性，缩短整条线的交货周期。
Modularized design of vacuum chambers improves machining efficiency. Interchange of the chief parts can shorten the delivery period of the whole coater.
- 集成式溅射阴极设计，将工艺气体控制、水电连接及电气控制完美的结合在一起，使工艺布置更加灵活，设备升级更加容易。
An Integrated cathode lid realizes a perfect combination by putting gas manifold, controllers, connections for power supply and various media in a "box" to make the process configuration more flexible.

- 服务阀采用标准并位的闭锁阀设计，避免腔体端面连接板受力不均、腔体变形，阀芯利用弹性气囊撑开式结构，有效减少了阀板的工作行程，阀芯可以单独拆卸，方便维护。
The service valve designed to install in the small chamber with standard compartments to avoid non uniform load of the chamber' s end connecting plate and deformation of the chamber; the elastic air bag open structure of the valve core to reduce the valve plate' s working distance efficiently; the removable valve core to make the maintenance convenient.
- 提供专用换靶小车，换靶及维修清理工作更加方便、快捷。
New cathode service carts are provided to make the cathode maintenance more convenient and rapid.
- 新型可拆卸阴极屏蔽挡板，保护腔室不受污染，大大缩减维护时间。
The new sputtering shields are installed to prevent the chambers from pollution of sputtering. They are easy to change and make downtime less.

■ 液压式盖板 / Hydraulic Lid

整体式盖板和液压提升机构的设计，实现盖板的自动控制，提供设备的自动化水平，缩短设备检修维护时间，降低镀膜线厂房空间要求。

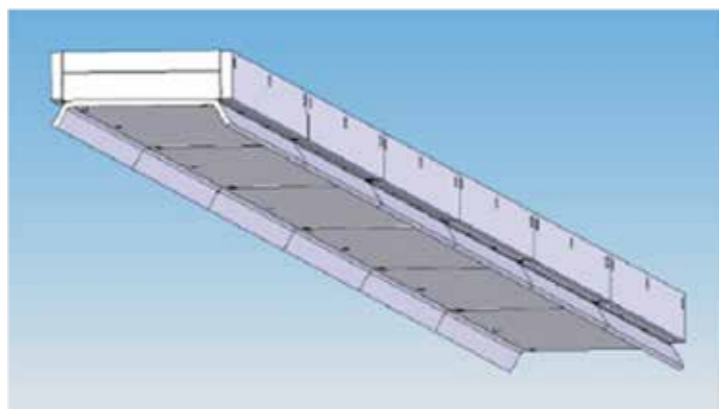
The one-large lid with hydraulic lifting mechanism is designed to achieve the automatic control of the lid, which can improve the automation level of the coater, shorten the maintenance time and reduce the building space needed.



■ 工艺气体分配系统 / Process Gas Distribution

采用多段补气调节，每段可根据工艺需要选择不同类型的工艺气体，膜层均匀性可以控制在 $\pm 1\%$ 以内。

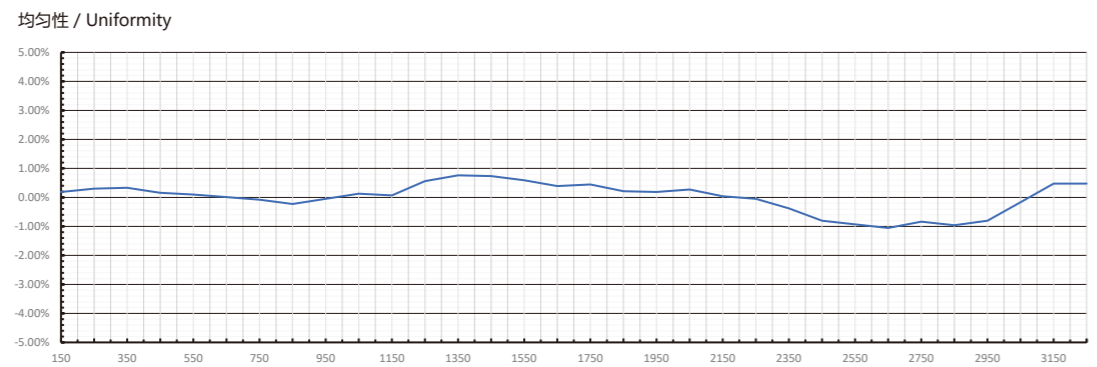
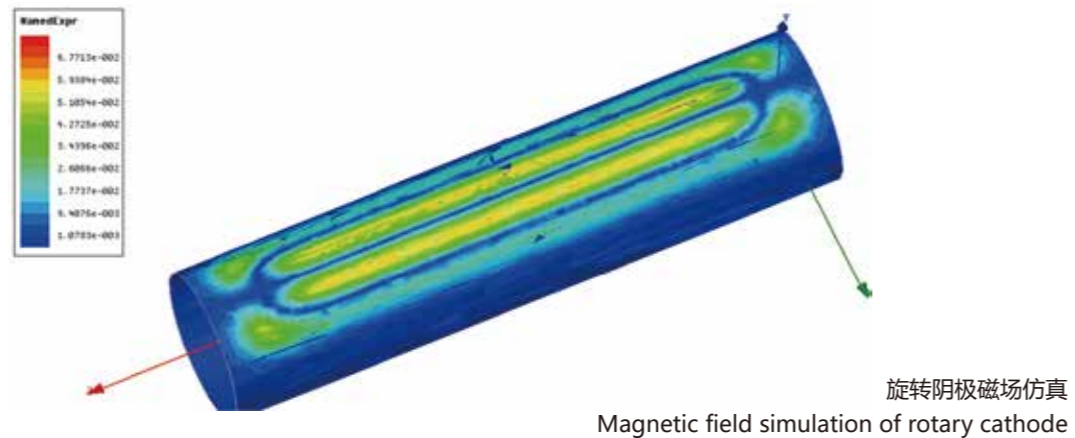
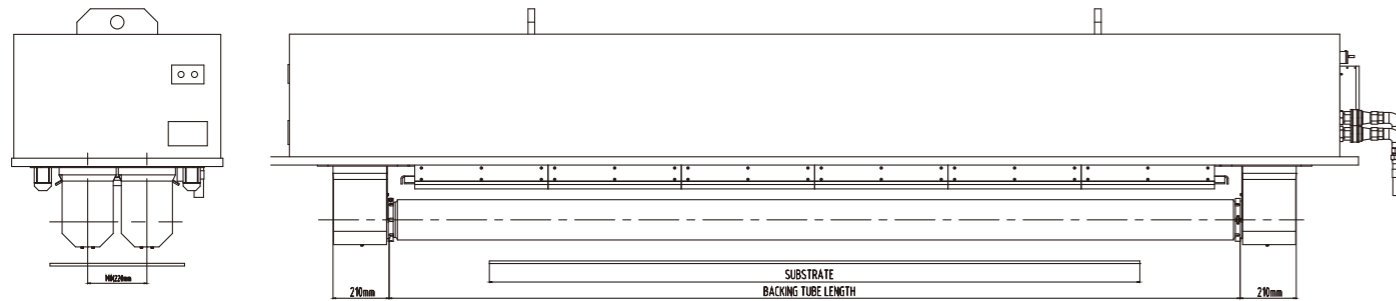
Multi-section trim process gas system is equipped, each section of which can flow different process gas according to the process requirement. The uniformity of the layer can be controlled in the range of $\pm 1\%$.



- 配置高速装卸片台，实现高速生产。
High-speed loading and unloading systems help the coater to achieve a high-speed production.
- 配置高性能镀膜用清洗机，实现多级清洗，可抛除玻璃表面老化层，保证玻璃表面洁净，有利形成致密膜层。
A high-performance washing machine is equipped to realize a multi-stage cleaning that removes surface impurities easily and benefits forming compact layers.
- 配置多点位、多角度膜系自动检测监控系统，确保镀膜质量和产品稳定性。
An optical detecting and monitoring system with multi-point and multi-angle is set to ensure the layer quality and product stability.

■ 北玻提供旋转阴极和平面阴极（含盖板、工艺气路）的完整阴极总成。溅射器件可根据镀膜线的实际井位尺寸进行定制，方便客户进行镀膜系统设计集成。具有本地操作控制和远程操作控制两种模式，可根据需要选择数字量总线或模拟量I/O接口与镀膜系统通讯。

NorthGlass can offer you the complete rotary cathode and planar cathode system (incl. lid, gas distribution). The sputtering device can be customized for all new and existing coater, which can facilitate the customer to integrate in the coater with local and/or remote control (digital or analog).



单靶横向均匀性示例 (3300mm)
Uniformity of single rotary cathode

磁棒 / Magnet Bar:

- 采用全封闭式铝型材结构，将磁铁及磁轭部分完全与靶筒内的冷却水分隔开，避免因长期浸水腐蚀引起的磁场变化；
The extruded aluminum support structure makes the magnet and magnet yoke isolating from the cooling water in the target tube, which can avoid the change of the magnetic field owing to bathing in water after a long time;
- 型材式结构大幅加强了磁棒的刚性，避免磁棒变形与靶筒发生摩擦产生的磁场变化；
It improves the rigidity of the magnet bar, which can reduce the fluctuation of the magnetic field due to the friction between the twisted magnet bar and target tube;
- 磁场调整更便捷；
By the new structure, it allows the magnet homogeneity to be easy and convenient to be adjusted;
- 出水孔的出水直接射向溅射靶材高温区，冷却效果更佳；
Cooling water is ejected directly to the high temperature location of the target so it brings better cooling effect;
- 安装维护简易方便。
It's easy and convenient to install and maintaining.



端头 / End Blocks:

- 提供紧凑型 and 标准型端头，采用标准接口设计，兼容性强；
Provided two types of compact and standard end blocks, as well as the standard interface for good compatibility;
- 紧凑型端头结构紧凑、占空小、成本低，标准型端头，性能更加稳定、维护方便快捷；
Compact end block with single-end is smaller with less space needed and lower cost; standard end block with double-end is more stable and easier for maintenance;
- 内嵌式碳刷设计有效增加电流通过表面积，提高端头最大耐受电流及高功率运行的稳定性；
The embedded carbon brush design efficiently increases the surface current, increasing the maximum withstand current and improving the operation stability under high power.
- 机械密封式设计，避免渗水现象，大大延长了端头的使用寿命；
The mechanical sealing avoids water leakage, and ensures the longer lifetime;
- 目前有500个以上的端头在各个现场稳定运行。
Over 500 end blocks are installed and running in all customers' sites.



镀膜线应用

APPLICATION

建筑镀膜 / Architectural Coating Solutions

北玻镀膜水平式建筑镀膜线，采用磁控溅射沉积技术，在玻璃表面沉积一系列介质和金属薄膜，主要用于加工各种Low-E玻璃、AR膜，以及阳光控制玻璃等。

NorthGlass horizontal architectural glass coaters mainly produce Low-E coated glass, solar-control glass, AR film, etc. by using magnetron sputtering method depositing different kinds of material on the substrate.

主要参数 / Main Data of Coater

极限真空 (Ultimate pressure)	< 2 × 10 ⁻⁶ mbar
机械节拍 (Cycle time)	≥ 35 s (jumbo coater)
	≥ 25 s (standard coater)
基片尺寸 (Substrate size)	Max. 3300 mm × 6000 mm (W × L) (jumbo coater)
	Max. 2540 mm × 3660 mm (W × L) (standard coater)
厚度范围 (Substrate thickness)	3 - 19 mm
有效生产时间 (Up time)	≥ 90%
最大年产能 (Max. annual capacity)	12,000,000 m ² (jumbo coater)
	7,500,000 m ² (standard coater)

注：以上参数仅作参考

汽车镀膜 / Automotive Coating Solutions

北玻自主开发的汽车前挡镀膜线，采用磁控溅射沉积技术，在玻璃表面沉积一系列介质和金属薄膜，主要用于加工高性能隔热汽车前挡镀膜玻璃，可见光透过率高于75%，太阳透过率低于35%。

NorthGlass automobile coater is applied to deposit a series of functional films on the surface of front windshield in order to get good quality coated glass with light transmittance of over 75% and solar transmittance of below 35%.

主要参数 / Main Data of Coater

基片 (Substrate)	汽车前挡玻璃 (Automobile windshield glass)
基片尺寸 (Substrate size)	Max. 1500 × 2000 mm (W × L) (customizable)
基片厚度 (Substrate thickness)	1.6 - 6 mm (customizable)
机械节拍 (Cycle time)	> 17 s
极限真空 (Ultimate pressure)	< 2 × 10 ⁻⁶ mbar

注：以上参数仅作参考

制镜镀膜 / Mirror Coating Solutions

北玻环保制镜线，采用磁控溅射技术，主要用于加工各种高品质环保镜，其中所加工的环保Al镜反射率达到80%以上。设备还配置机器人上下片系统确保设备全自动高效运行。

NorthGlass Mirror coater is used to produce all kinds of good quality environmental-friendly mirrors by sputtering down, especially Al mirror with reflection of more than 80%. The robot system can make sure of automatic and high efficient operation.

主要参数 / Main Data of Coater

基片 (Substrate)	浮法玻璃、钢化玻璃、或经殊处理的平板玻璃 (float glass, tempered glass, special pretreated flat glass)
基片尺寸 (Substrate size)	Max. 2440 × 3660 mm (W × L) (customizable)
基片厚度 (Substrate thickness)	2 - 10 mm (customizable)
机械节拍 (Cycle time)	> 30 s
极限真空 (Ultimate pressure)	< 8 × 10 ⁻⁶ mbar
上下片方式 (Loading / Unloading)	自动或手动 (Automatic or manual)
漆膜 (Painting)	1 or 2

注：以上参数仅作参考

