



NorthGlass Online



NorthGlass "WeChat"

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Stock Code: 002613

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# **Glass Tempering Furnace**



## 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.

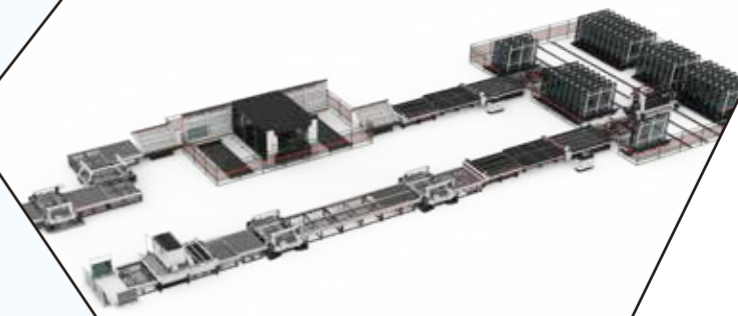
In 2015, a holding subsidiary "Shanghai North Glass Automation Technology Co., Ltd." was established, which opens a new chapter of Industry 4.0 in glass deep processing industry in China.

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

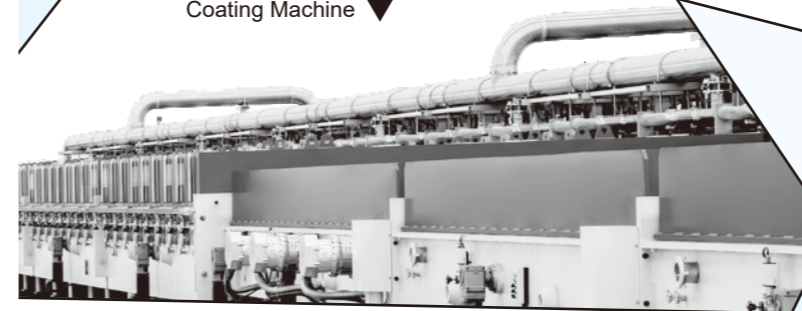


Glass Automation System ▲

Glass Tempering Furnace ▼



Coating Machine ▼



Glass Cutting Machine ▼



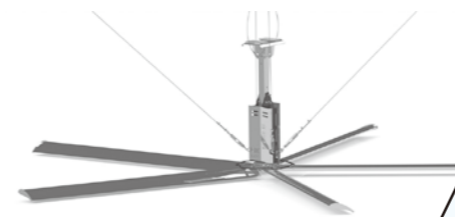
Glass Storage System ▼



▼ 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..

## Tempering Furnace Business Unit Introduction

As the first BU, Tempering Furnace Division (TFD) is always the core sector of NorthGlass with the largest sales value since 20 years ago. Since the development and sales of first glass tempering furnace in 1995, TFD has totally produced and sold more than 4400 glass tempering furnaces. These furnaces were sold not only in China, but also exported to more than 100 countries & regions, including USA, Germany, Switzerland, UK, France, Russia, Turkey, Saudi Arabia, UAE, Japan, Australia, South Korea, India, Singapore, etc. We have repeatedly created and broken our own world records, such as  $8 \times 4$  m bent tempering furnace,  $3.4 \times 20$  m flat glass tempering furnace,  $3.6 \times 18$  m flat/bent glass tempering furnace. NorthGlass's continuous glass tempering furnace is taking an absolute leading position in the market, the cumulative sales is more than 200 sets. In whatever capacity, energy consumption, or product quality and equipment stability, NorthGlass continuous tempering furnaces are significantly ahead of the other competitors, becoming the first choice for photovoltaic industry and other industrial glass processors.

Leading glass tempering technology, advanced R&D capability, strong manufacturing bases, complete sales & service network, all these are NorthGlass's core competence, meanwhile strong security to NorthGlass furnaces' efficient and stable running all over the world. NorthGlass's reference customers are CSG, XYG, FUYAO, SYP, Taiwan Glass, FGG in China, and SGG, PILKINGTON, AGC, GUARDIAN, GLAS TROESCH, SCHOLLGLASS, SUNGLASS, VALENTINI, VITRO in Overseas. Multiple glass deep-processing technologies developed by NorthGlass have been successfully applied in a lot of famous construction projects all over the world. Several classic and representative projects with glass produced by NorthGlass and our furnaces are briefly introduced on Page 24-28.



# Tempering Furnace Series



## Top series (T-Series)



**T-Series:** Standardly furnished with "Finer Heating Control Partition" and "Intelligent Heating Control System based on glass exit-chamber temperature", suitable to produce highest quality tempered glass with big production quantity and high efficiency and stability. It is the ideal choice of domestic & foreign large-scale glass processors for industrial upgrading.

## The 3<sup>rd</sup> Generation of Advanced Series ( A-Series )



**A-Series:** Standardly furnished with "Intelligent Heating Control Module" and "Super Flat & Spotless technology", optionally with "5G Gapless Forced Convection technology", A-series tempering furnace can efficiently & stably temper almost all kinds of glass with minor optical distortion and slight iridescence. It is the most popular choice of glass tempering furnaces for all different scale glass processors.

## The New Generation of Basic Series ( B-Series )



**B-Series:** Completely upgraded and reborn from NorthGlass's classic B-series furnace, furnished with recently developed new "Temperature Control System" and "Basic Gapless Forced Convection System", significantly improve the production efficiency and glass quality meanwhile reduce the energy consumption. It is an affordable choice for small & medium scale glass processors.

# Top Series (T-Series)



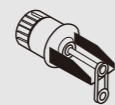
TG12B6025

## Gapless Forced Convection technology <sup>Ⓟ</sup> <sup>Ⓢ</sup>



Ideally combined features of accurate heating control by longitudinal convection pipes and uniform stress distribution by lateral convection arrangement ensure the high tempering quality for oversized glass and Low-E curtain wall glass.

## Convection Fan exclusively <sup>Ⓟ</sup> made by NorthGlass



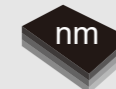
Significant advantages of high efficiency, energy saving and stability, guaranteed by adoption of high temperature alloy material, thermal blocking bridge and passive cooling technologies.

## Dual Photoelectric Sensors <sup>Ⓟ</sup> <sup>Ⓢ</sup> glass length measurement



Double measurements, two calculating methods, selection for better, all these double guarantee the accuracy of glass length measurement and thereby assure the continuity and stability of glass production.

## Nanotechnology Thermal Insulation Material



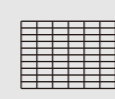
The new nanotechnology thermal insulation material, co-developed by NorthGlass and a national scientific research institute, provides better heat preserving and energy saving performances by blocking the internal micro air convection.

## Intelligent Heating Control Module <sup>Ⓟ</sup>



The independent intelligence Heating Control Module, co-developed by NorthGlass and her professional partners, enables a precise & stable heating control with distinct advantages of agility, swiftness, anti-interference.

## Finer Heating Control Partition



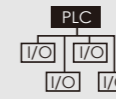
Finer heating control partition and accordingly more heating elements can ensure more accurate and easier heating to processed glass, thereby help you to produce top-level quality tempered glass.

## Bending & Tempering technology with Rigid Rollers



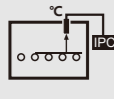
The cylindrical pathway formed by upper and lower rigid conveyor rollers, curvature along production direction, can produce the curved & tempered glass with best goodness of fit without bearing excess force during formation.

## Control System by Sub-stations



Each section of NorthGlass furnace is controlled by a distributed I/O control based on Profinet fieldbus, easy for assembly and maintenance, stable & reliable for running.

## Intelligent Heating Control System <sup>Ⓟ</sup> based on glass exit temperature



An innovative concept of heating process control, can successfully eliminate the glass temperature deviation caused by thickness tolerance by real-time monitoring and controlling upon glass exit-chamber temperature, thereby reduce the processing difficulty while improve the glass quality.

## Super Flat & Spotless technology <sup>Ⓟ</sup>



Staggered arrangement of 8-rows blowing nozzles combining with patented quench section lateral swing structure are adopted for even quenching and thereby slighter iridescence which leads the world's top level glass optical quality.

## Concave / Convex Bending & Tempering technology with Flexible Rollers <sup>Ⓢ</sup>



The cylindrical surface formed by flexible conveyor rollers, curvature perpendicular to production direction, can produce the curved & tempered glass with longer straight line exceeding the limitation of furnace width. The convex bending & tempering technology with flexible rollers can be chosen, to meet different processing requests to coated glass.

## Ultra-wide & Super-long Tempered Glass



NorthGlass's mature glass tempering technologies have been proved by several ultra-wide & super-long glass tempering furnaces which create the world records with maximum glass size of 3.6x18m for both flat and bent tempered glass and 8.0x4.0 m for bent tempered glass.

Note: <sup>Ⓟ</sup> means patented technology    <sup>Ⓢ</sup> refers to selective component

# Advanced Series (A-Series)



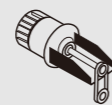
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## Gapless Forced Convection technology <sup>®</sup> <sup>Ⓢ</sup>



Ideally combined features of accurate heating control by longitudinal convection pipes and uniform stress distribution by lateral convection arrangement ensure the high tempering quality for oversized glass and Low-E curtain wall glass.

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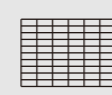
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## Finer Heating Control Partition



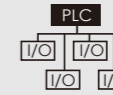
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## Bending & Tempering technology with Rigid Rollers



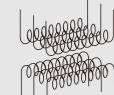
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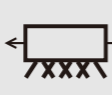
Each section of NorthGlass furnace is controlled by a distributed I/O control based on Profinet fieldbus, easy for assembly and maintenance, stable & reliable for running.

## Symmetrical Heating Technology <sup>Ⓢ</sup>



Symmetrical heating control layouts in top and bottom chambers and power allocation on demand finally bring heating results evenly on upper and lower surfaces of the processed glass.

## Super Flat & Spotless technology <sup>Ⓢ</sup>



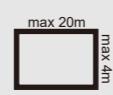
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# A-Series Furnace Specifications

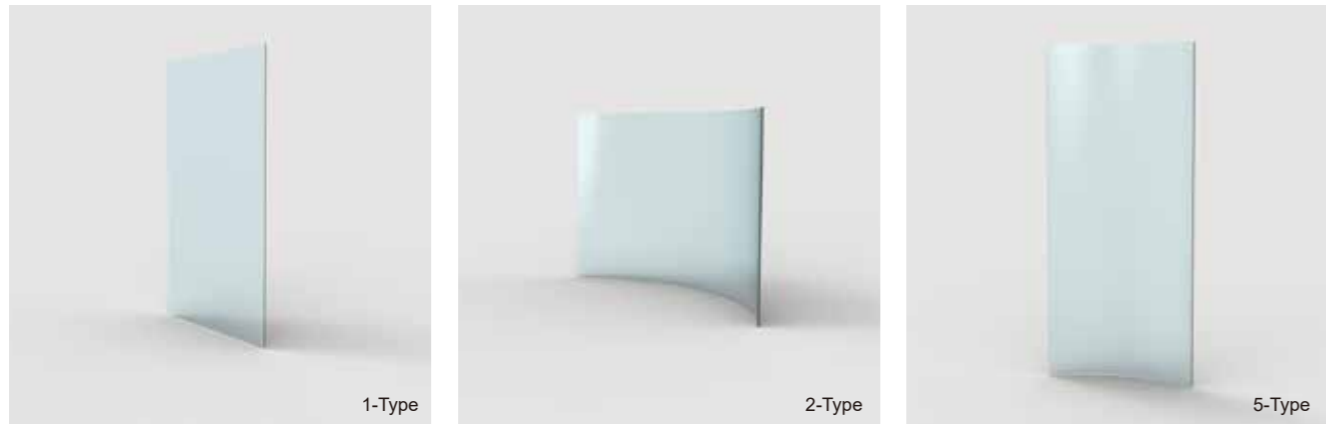
# A-Series Furnace Assembly Examples

Glass Type	Clear float glass (5mm)	Single Silver Low-E (5mm)	Double Silver Low-E (5mm)	Triple Silver Low-E (5mm)	Clear float glass (3mm)
General Bow (‰)	0.5	0.5	0.5	0.5	/
Local Bow (mm/300mm)	0.08	0.1	0.12	0.15	/
Capacity(batch/hour)	22~24	16~18	13~15	11~13	>880m <sup>2</sup> /h
Energy Consumption (kW·h/m <sup>2</sup> )	3.6~3.8	3.8~4.0	3.9~4.1	/	2.5~2.8
Remark	Above data is based on a AG-1B50 furnace.				Above data is based on 36m long heating chamber

Max. Loading Size (mm)	3600×18000	3600×18000	8000×4000	1650×800 (continuous bent tempering)
Emmissivity	≥ 0.01			

Remark: Data above is only for reference.

## Optional Quench Sections



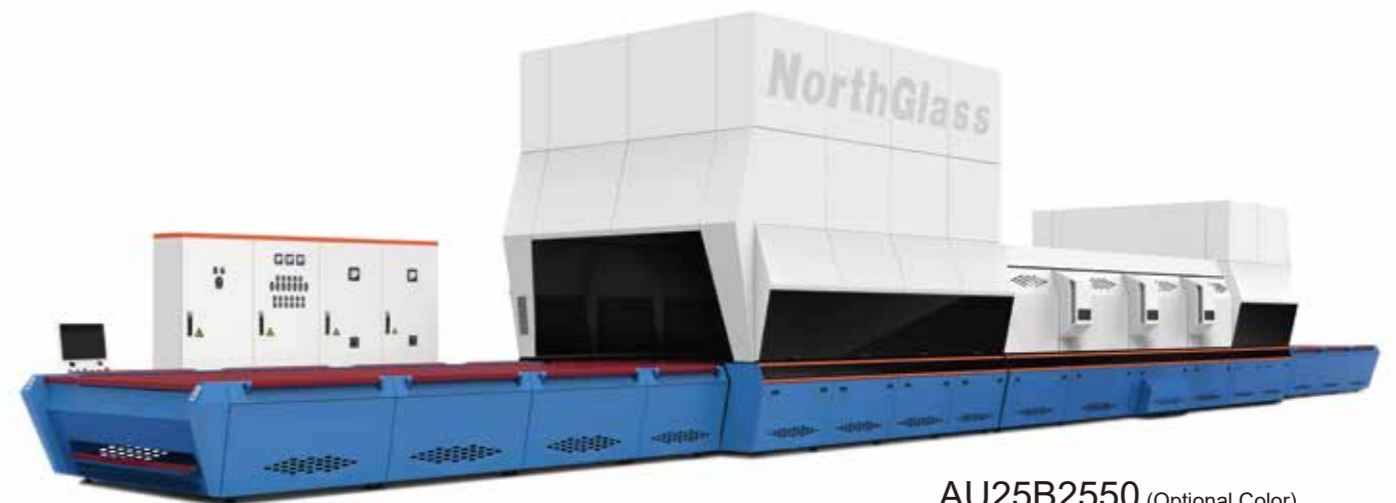
Width Code	A	P	Q	B	E	S
Max. Glass Width (mm)	1250	1700	2100	2440	2850	3300



AG1B50-UUD (Optional Color)



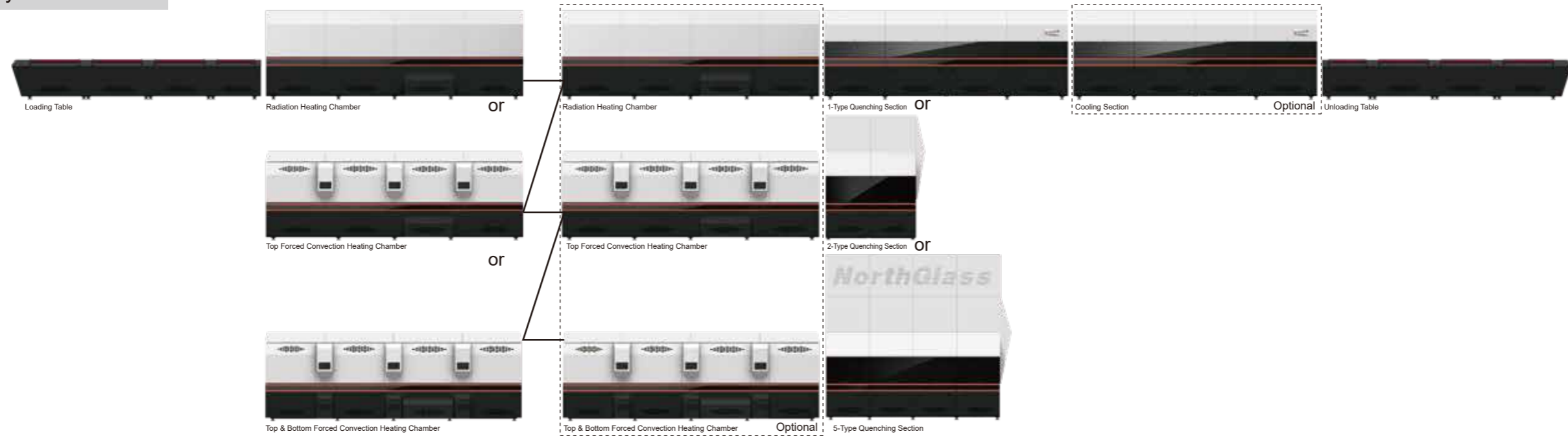
AG12B5025 (Optional Color)



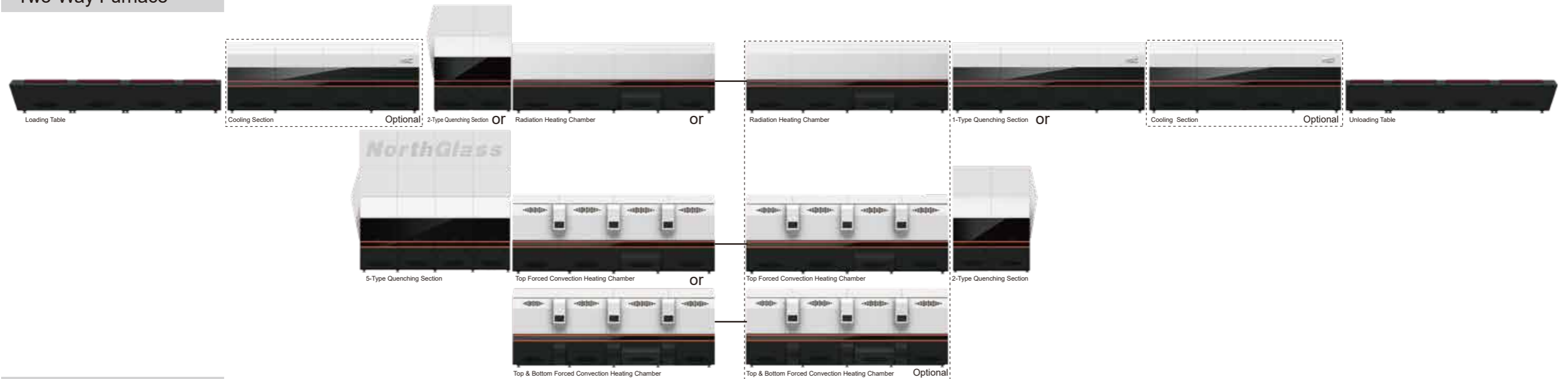
AU25B2550 (Optional Color)

# Typical Furnace Assembly Examples

## One-Way Furnace



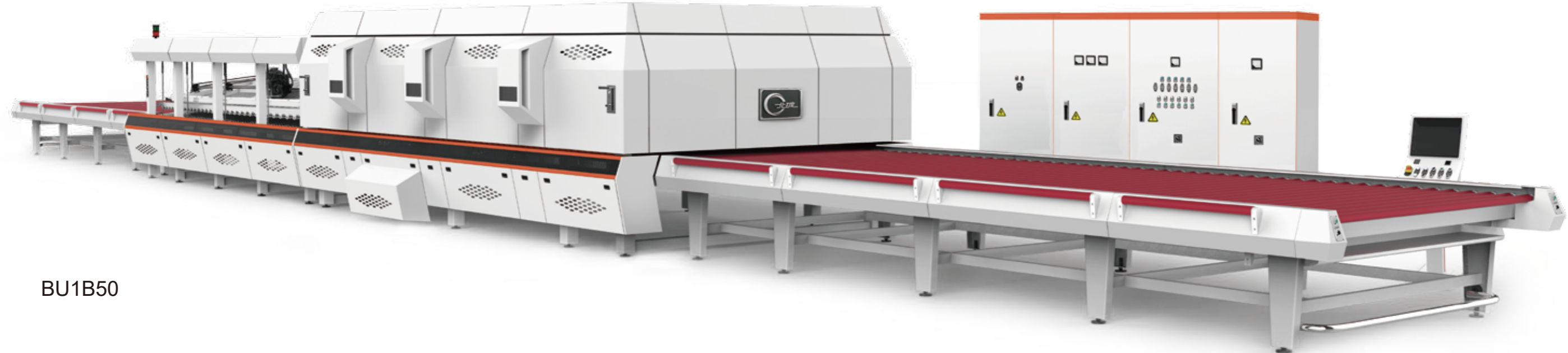
## Two-Way Furnace



## Continuous Furnace



# Basic Series (B-Series)



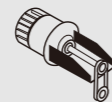
BU1B50

## Gapless Forced Convection technology <sup>®</sup> <sup>Ⓢ</sup>



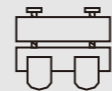
Ideally combined features of accurate heating control by longitudinal convection pipes and uniform stress distribution by lateral convection arrangement ensure the high tempering quality for oversized glass and Low-E curtain wall glass.

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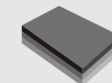
Significant advantages of high efficiency, energy saving and stability, guaranteed by adoption of high temperature alloy material, thermal blocking bridge and passive cooling technologies.

## Grouped Frame Quenching Wall Structure



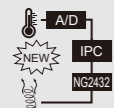
The different quenching wall units can be adjusted separately, finally the whole quenching wall can be calibrated.

## Layered Thermal Insulation Materials



The heating chamber thermal insulation consists of different layers with progressive insulating performances and material strengths for higher heat resistance, lower thermal conductivity and better energy saving performance.

## NorthGlass New Heating Control System



Advantages of stable heating current, fast response speed, strong anti-interference ability, accurate and stable heating control.

## Gapless Heating technology



Oblique arrangement of heating elements cleverly eliminates the effect of heater spacing and bring more uniform heating result to the glass.

## Bending & Tempering technology with Rigid Rollers



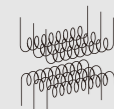
The cylindrical pathway formed by upper and lower rigid conveyor rollers, curvature along production direction, can produce the curved & tempered glass with best goodness of fit without bearing excess force during formation.

## Multi-layer Deflector



The multi-layer deflector can effectively prevent the air backflow from the quenching to the heating chamber, ensure the temperature uniformity inside the heating chamber and then improve the tempered glass quality.

## Symmetrical Heating Technology



Symmetrical heating control layouts in top and bottom chambers and power allocation on demand finally bring heating results evenly on upper and lower surfaces of the processed glass.

## Wider 4-sides Blowing Nozzle Structure



Staggered arrangement of 4-rows wider blowing nozzles with different blowing directions, plus more dense air nozzles layout, make the iridescence slighter.

## Concave / Convex Bending & Tempering technology with Flexible Rollers



The cylindrical surface formed by flexible conveyor rollers, curvature perpendicular to production direction, can produce the curved & tempered glass with longer straight line exceeding the limitation of furnace width. The convex bending & tempering technology with flexible rollers can be chosen, to meet different processing requests to coated glass.

## Radiation Heating Plate



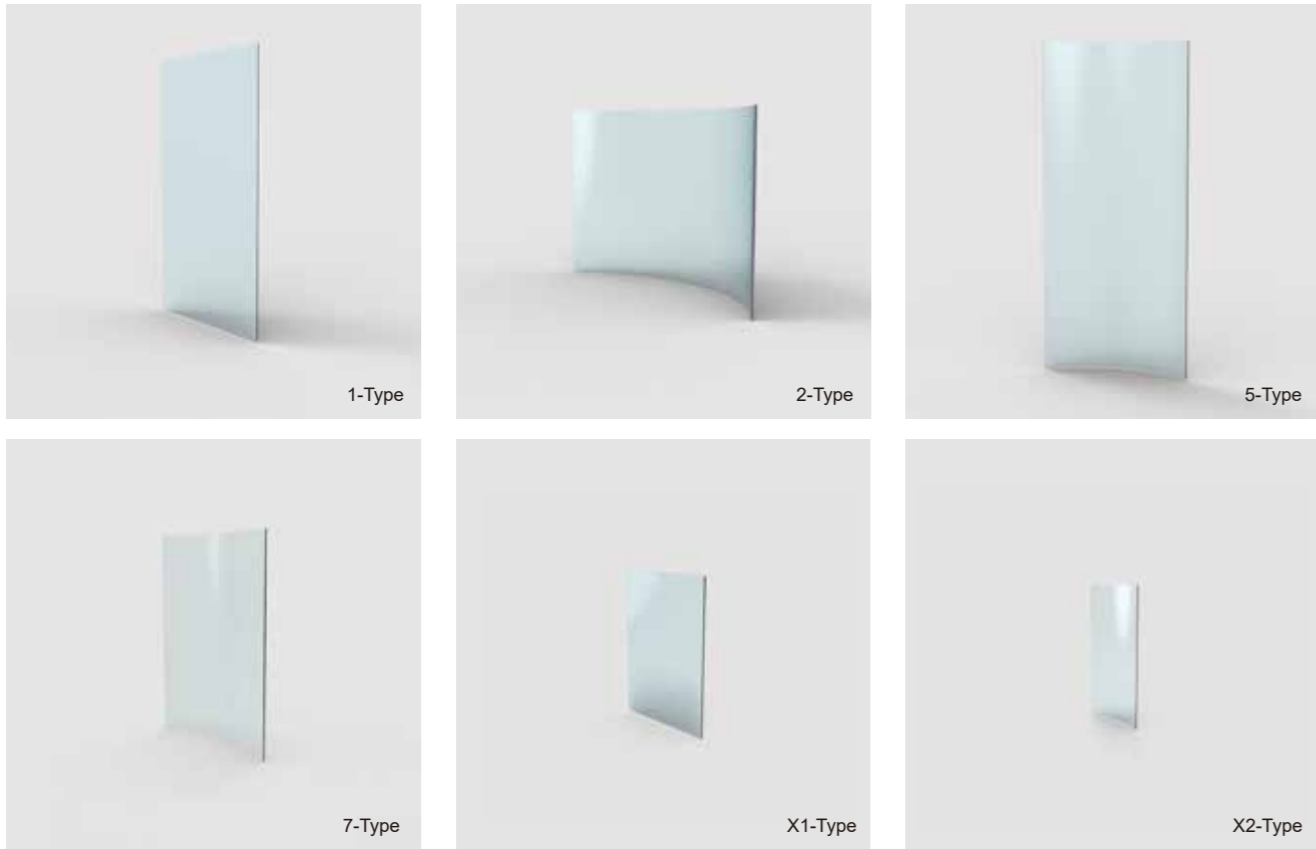
The radiation heating plates made of heat-resistant cast steel can bring more uniform and gentle heating to processed glass, finally ensure a high quality to tempered glass, especially to large and thick glass panels, suitable for applications of appliances glass, furniture glass, glazed glass, etc..

# B-Series Furnace Specifications

# B-Series Furnace Assembly Examples



## Optional Quench Sections



Width Code	A	P	Q	B	E	S
Max. Glass Width (mm)	1250	1700	2100	2440	2850	3300

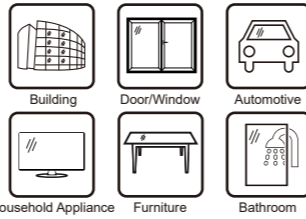
# Typical Applications of Different Quenching Sections

# Reference Glass Applications & Tempering Furnace Used

1-Type



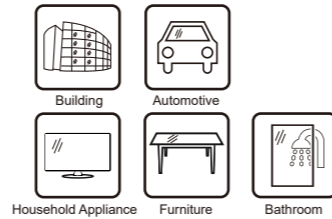
Quenching section for flat tempered glass



2-Type



Bent forming & quenching section by rigid rollers for cylindrical bent tempered glass with straight edge perpendicular to production direction.



3-Type



Bent forming & quenching section by mould for multi-curvature bent tempered glass.



5-Type



Bent forming & quenching section by flexible rollers for cylindrical bent tempered glass with straight edge parallel to production direction.



7-Type



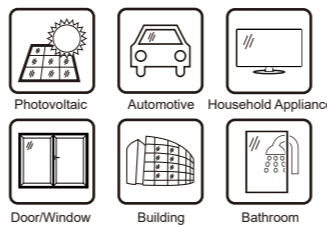
Bent forming & quenching section by flexible rollers for single surface but multi-curvature bent tempered glass.



X1-Type



Quenching section for one-way transmission continuous flat tempering



X2-Type

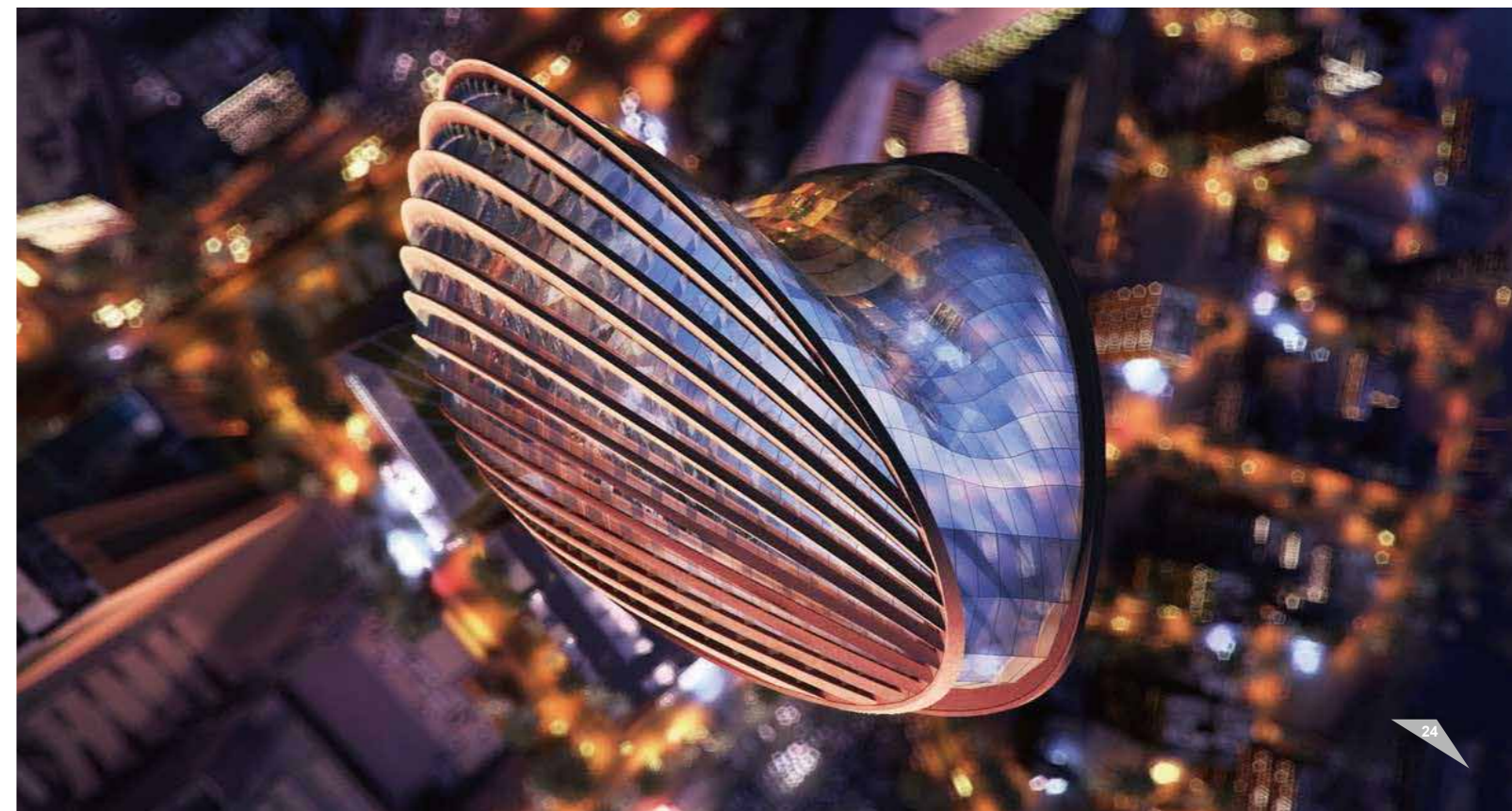


Bent forming & quenching section by rigid rollers for one-way transmission continuous bent tempering with straight edge perpendicular to production direction.



▲ Shanghai Tower  
Glass makeup: 6mm glazed glass HS +1.52 PVB + 6mm solar control coated glass (4#) +16mm AR + 6mm Clear glass + 0.38 PVB + 6mm clear glass  
Furnace used: B22S2536 & B15B8050

▼ National Bank of Kuwait  
Glass makeup: 8mm heat-reflective glass+1.52 PVB+8mm clear glass HS+16mm A+6mm double-Ag Low-E glass+8mm Heat-reflective glass+1.52 PVB+8mm clear glass Tempered+16mm A+6mm double-Ag Low-E glass+1.52 PVB+6mm Tempered glass  
Furnace used: AG15B50 (bending upwards & downwards)



# Reference Glass Applications & Tempering Furnace Used



▲ Headquarters of the world's most famous consumer electronics company, US  
Furnace used: AU15M180, AG1T165



▲ Manchester Town Hall, UK  
Glass makeup: 3x12mm low iron glass curved tempered HST+2x1.52 SGP  
Furnace used: AC15E128

▼ London Leiden Building, UK  
Glass makeup: 6mm glazed glass HS+1.52PVB+6mm SunGuard SN51/28 Low-E glass HS (4#) +16mm AR + 6mm clear glass+0.38 PVB + 6mm clear glass  
Furnace used: AD1B80-GD

▼ Abu Dhabi Airport, UAE (Under Construction)  
Glass makeup: 6mm glazed glass HS+1.52 PVB+6mm Low-E coated glass HS+12mm A+6mm glass HS1.52 PVB+6mm glass HS  
Furnace used: AU12S9042



# Reference Glass Applications & Tempering Furnace Used



▲ Boeing 737 Delivery Center (Under Construction)  
Glass makeup: 10mm clear glass+2.28 PVB+10mm Low-E coated glass+16mm A+12mm dual curvature glass insulated  
Furnace used: AG22K2536 ( bending upwards & downwards )

▼ Wind Tunnel Cabin of "Quantum of the Seas" Cruise  
Glass makeup: 10mm super clear glass curved tempered HST (outer layer)+1.52SGP+10mm super clear glass curved tempered HST+2.28 SGP+10mm super clear glass curved tempered HST  
Furnace used: AC15E128



▲ Twin Towers in Xi'an Greenland Center  
Glass makeup: 10mm double-Ag Low-E coated glass+16mm AR+10mm clear flat glass tempered insulated+8mm double-Ag Low-E coated glass+16mm AR+8mm clear flat glass tempered insulated  
Furnace used: TG1B50

▼ Beijing New Airport (Under Construction)  
Glass makeup: 12mm super clear double-Ag Low-E coated glass tempered (outer layer) #2+18mm A+(14mm A+metal mesh)+6mm super clear glass tempered+2.28 SGP+6mm super clear glass tempered  
Furnace used: BD1B80-GUD





## Sales Network

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NorthGlass (Luoyang)  
Tel: 0086-379-64311810  
Fax: 0086-379-65110512  
Email: stephanie@northglass.com

## Sales Agent:

Two large, empty dashed-line boxes intended for listing sales agents.