KAPHS

MIDDLE EAST

NorthGlass®

Jumbo Glass

Ultra-large flat & curved architectural glass for landmark façades

KAPHS

NORTHGLASS / CATALOGUE 2026

Contents

A complete guide to NorthGlass Jumbo Glass — concept, capabilities, coatings, quality standards and landmark projects, from flat to curved.

A Swiss-founded specialist for high-end architectural glass.

KAPHS, headquartered in Dubai with Swiss origins, is a distinguished provider of high-end architectural glass, metal mesh and cladding for the Middle East region.

Founded in 2003, KAPHS has expanded across the Middle East, North Africa and Southeast Asia, partnering with architects, designers, engineers, contractors and manufacturers. We bring together world-leading manufacturers to deliver landmark façade and interior solutions.

2003	3	∞
FOUNDED	REGIONS	PROJECTS

A global leader in super-sized architectural glass.

Since its inception, Tianjin NorthGlass has rapidly become a global leader in high-quality architectural glass, specialising in super-sized tempered, laminated, insulated and digitally printed panels for landmark projects worldwide.

A subsidiary of Luoyang North Glass Technology Co., Ltd. (founded 1995), Tianjin NorthGlass operates in over 100 countries. As regional partner, KAPHS brings NorthGlass's advanced products and technical expertise to the Middle East's most ambitious façade and interior projects.

1995	100+	25m
FOUNDED	COUNTRIES	MAX LENGTH

SECTION

KAPHS

03

Flat Jumbo Glass

Ultra-large flat panels for unbroken façades, transparent towers and monumental glass walls.

Seamless façades at architectural scale.

Minimised joints. Uninterrupted views. Engineered for the Middle East.

NorthGlass is globally recognised as a pioneer in the production of ultra-large architectural glass, enabling the world's most ambitious façade designs. Through KAPHS — the official representative in the Middle East — these advanced jumbo solutions are available for landmark projects requiring scale, clarity and high performance.

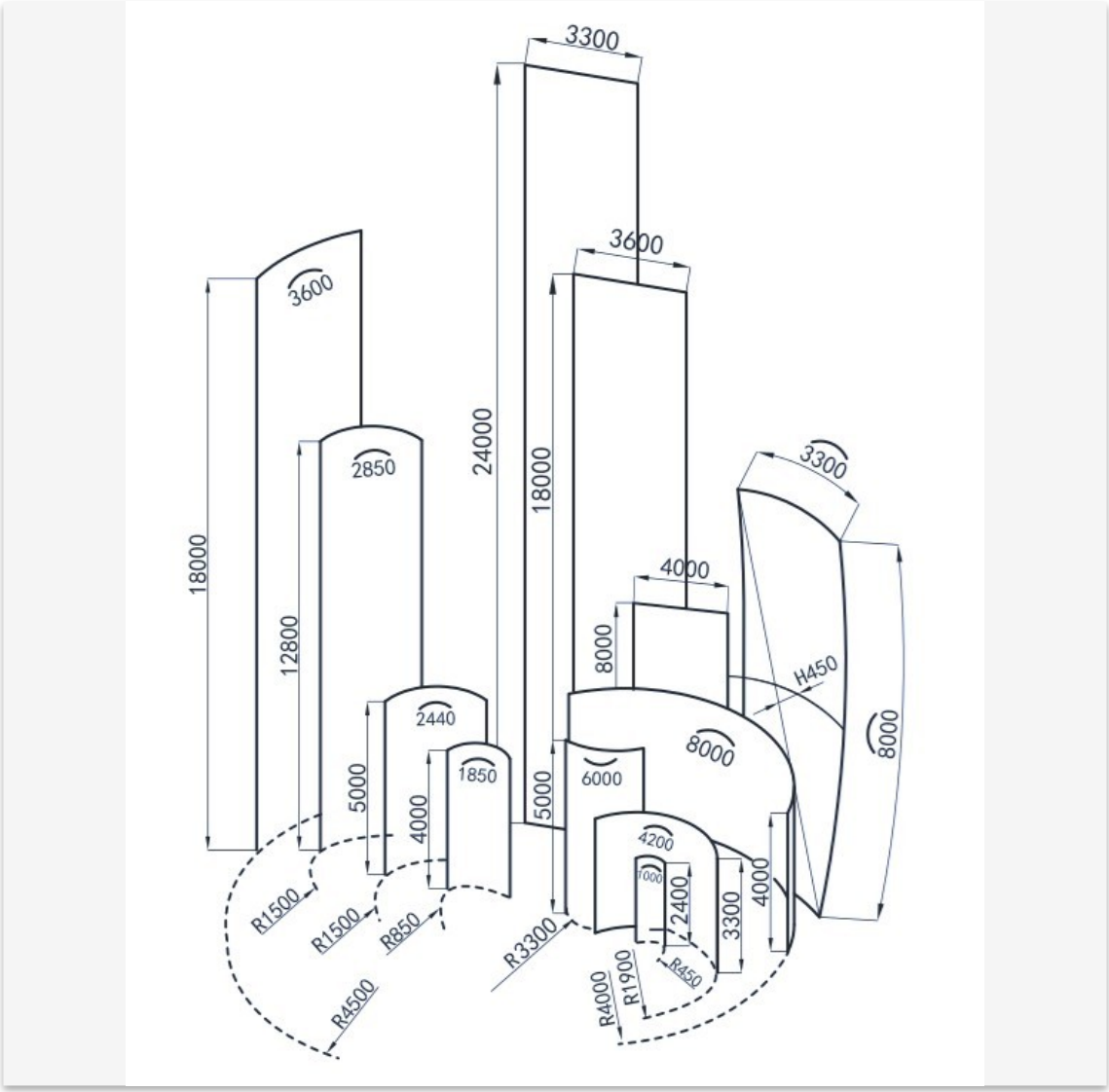
Oversized panels are engineered with precision and tailored to project requirements: tempered, laminated, insulated, low-E coated or curved. Each delivers excellent thermal insulation, solar control, acoustic performance and structural safety in demanding climates.

Maximum processing sizes.

The full envelope of NorthGlass jumbo flat-glass production.

NorthGlass operates the industry's largest jumbo glass processing lines, supporting panels up to 24 metres in length and over 4 metres in width. The diagram opposite shows the manufacturable size envelope across the flat, semi-bent and 3D curved processes.

Each panel is custom-engineered around its end-use, with size, radius and arc-height options matched to architectural intent and façade engineering.



Engineered for scale and consistency.

Jumbo glazing across coated, tempered, laminated, IGU and decorative processes.

Process	Max Size (mm)
Coated Glass (Low Iron & Float)	3,300 × 25,000 mm
Coated Glass (Standard Float)	4,000 × 25,000 mm
Flat Tempering (Coated Glass)	3,300 × 25,000 mm
Insulated / Laminated / Heat-Soaked	3,300 × 25,000 mm
4SG Spacer Insulated Glass Units	3,300 × 7,000 mm
Digital Printed Glass	3,300 × 18,000 mm
Ceramic Frit Glass	3,300 × 18,000 mm

SECTION

04

Coatings

Vertically integrated coating technology — single silver, double silver and solar control families, each engineered for daylight, solar gain and thermal performance.

In-house engineered. Optically refined.

Vertically integrated coating technology — controlled end to end.

NorthGlass distinguishes itself not only through large-format glass production, but also through its vertically integrated coating technology. Unlike many manufacturers, NorthGlass designs and manufactures its own coating equipment — enabling full control over coating quality, consistency and innovation.

The result is a comprehensive coating library — Single Silver, Double Silver and Solar Control — each engineered to optimise light transmission, solar heat gain and thermal insulation across jumbo-sized panels.

Single Silver Low-E — Performance Data

Balanced thermal performance with strong visual clarity.

Production name	Glass Buildup	Color	Light Transmission(%)			Solar Energy(%)		U Value [W/(M²·K)] (Air)		U Value [W/(M²·K)] (Argon)		SHGC	SC	Temperable	Bendable	Size
			Transmission	Out Door Reflectance	Indoor Reflectance	Transmission	Out Door Reflectance	Winter	Summer	Winter	Summer					
Single Silver Coating with clear base glass																
TNG11-89E	6CTNG11-89E#2+12mm Space+6C	Neutral	80.3%	12.0%	12.0%	52.2%	22.7%	1.71	1.67	1.44	1.37	0.58	0.67	N	N	3.3*18m
TNG11-85E	6CTNG11-85E#2+12mm Space+6C	Neutral	77.9%	12.2%	12.1%	52.1%	20.3%	1.80	1.8	1.55	1.52	0.58	0.67	N	N	3.3*18m
TNG11-80E-DB	6CTNG11-80E-DB#2+12mm Space+6C	Blue	72.2%	15.4%	12.8%	47.2%	24.1%	1.78	1.77	1.52	1.49	0.53	0.61	Y	Y	3.3*18m
TNG11-70E-DB	6CTNG11-70E-DB#2+12mm Space+6C	Light Blue	67.2%	18.5%	13.6%	44.3%	25.2%	1.78	1.76	1.52	1.48	0.5	0.58	Y	Y	3.3*18m
TNG14-60E	6CTNG14-60E#2+12mm Space+6C	Grey	52.5%	20.9%	10.9%	33.9%	24.7%	1.82	1.82	1.57	1.55	0.4	0.46	Y	Y	3.3*18m
TNG15-55E	6CTNG15-55E#2+12mm Space+6C	Light Blue	50.6%	33.8%	25.1%	28.3%	40.4%	1.7	1.66	1.42	1.35	0.33	0.38	N	N	3.3*18m
TNG14-55E	6CTNG14-55E#2+12mm Space+6C	Grey	47.5%	28.6%	17.3%	28.3%	31.8%	1.73	1.7	1.46	1.4	0.34	0.39	N	N	3.3*18m
TNG15-47E	6CTNG15-47E#2+12mm Space+6C	Light Blue	43.0%	35.8%	16.3%	25.1%	38.2%	1.72	1.68	1.45	1.38	0.3	0.34	N	N	3.3*18m
TNG16-48E	6CTNG16-48E#2+12mm Space+6C	Light Blue	42.8%	36.6%	22.0%	25.1%	38.2%	1.73	1.7	1.46	1.4	0.3	0.35	N	N	3.3*18m
TNG15-53E	6CTNG15-53E#2+12mm Space+6C	Light Blue	48.2%	33.2%	17.4%	28.0%	37.6%	1.71	1.67	1.44	1.37	0.33	0.38	N	N	3.3*18m
TNG16-47E	6CTNG16-47E#2+12mm Space+6C	Blue	42.9%	29.6%	12.9%	26.7%	29.0%	1.8	1.8	1.54	1.52	0.33	0.38	Y	Y	3.3*18m
TNG17-40E	6CTNG17-40E#2+12mm Space+6C	Grey	37.6%	47.6%	22.6%	22.1%	57.5%	1.69	1.64	1.41	1.34	0.25	0.29	N	N	3.3*18m
TNG17-37E	6CTNG17-37E#2+12mm Space+6C	Grey	33.6%	44.2%	15.9%	19.5%	43.1%	1.71	1.67	1.44	1.37	0.24	0.28	N	N	3.3*18m

Single Silver Coating with clear base glass. Data: TNG performance library — Sizes 3.3×18 m.

Double Silver Low-E — Performance Data

Enhanced solar control for high-performance façades.

Double Silver Coating with clear base glass																
TNG11-78D	6CTNG11-78D+12mm Space+6C	Neutral	70.3%	12.5%	13.3%	33.9%	34.4%	1.69	1.65	1.42	1.35	0.38	0.44	N	N	3.2*18m
TNG11-75D	6CTNG11-75D+12mm Space+6C	Neutral	68.7%	11.9%	13.1%	33.7%	31.6%	1.71	1.67	1.43	1.37	0.38	0.44	N	N	3.2*18m
TNG11-70D	6CTNG11-70D+12mm Space+6C	Neutral	64.5%	13.0%	15.8%	32.3%	32.2%	1.71	1.68	1.44	1.38	0.37	0.43	N	N	3.2*18m
TNG11-67D	6CTNG11-67D+12mm Space+6C	Dark Blue	61.6%	13.7%	17.6%	31.4%	30.9%	1.71	1.68	1.44	1.38	0.36	0.42	N	N	3.2*18m
TNG12-65D	6CTNG12-65D+12mm Space+6C	Blue	59.7%	12.3%	14.0%	28.9%	31.7%	1.70	1.67	1.43	1.36	0.34	0.39	N	N	3.2*18m
TNG12-60D	6CTNG12-60D+12mm Space+6C	Light Blue	54.4%	12.7%	12.7%	25.9%	29.7%	1.71	1.67	1.43	1.37	0.31	0.36	N	N	3.2*18m
TNG12-53ND	6CTNG12-53ND+12mm Space+6C	Light Blue	47.7%	17.4%	11.4%	21.1%	35.3%	1.67	1.62	1.39	1.3	0.26	0.30	N	N	3.2*18m
TNG12-62ND	6CTNG12-62ND+12mm Space+6C	Light Blue	56.2%	17.1%	14.1%	26.3%	33.2%	1.68	1.63	1.40	1.32	0.31	0.36	N	N	3.2*18m
TNG13-51ND	6CTNG13-51ND+12mm Space+6C	Light Blue	46.9%	17.4%	12.4%	20.3%	38.2%	1.67	1.62	1.39	1.3	0.25	0.28	N	N	3.2*18m
TNG11-80D-T	6CTNG11-80D-T+12mm Space+6C	Neutral	72.2%	11.9%	12.7%	38.4%	38.3%	1.66	1.61	1.39	1.3	0.42	0.49	Y	Y	3.2*18m
TNG12-55D	6CTNG12-55D+12mm Space+6C	Light Blue	50.6%	15.0%	13.5%	23.9%	31.2%	1.70	1.66	1.43	1.36	0.29	0.33	N	N	3.2*18m
TNG14-50D	6CTNG14-50D+12mm Space+6C	Light Blue	45.7%	27.7%	18.1%	20.2%	51.8%	1.68	1.64	1.41	1.33	0.24	0.27	N	N	3.2*18m

Double Silver Coating with clear base glass. Data: TNG performance library — Sizes 3.2×18 m.

Solar Control — Performance Data

Engineered for the Middle East's most demanding climates.

Solar Control Coating																
TNG11-80S	6C TNG11-80S#2	Neutral	80.8%	14.4%	13.4%	75.4%	11.7%	5.81	5.24			0.79	0.91	N	N	3.3*18m
SC70	6C SC70	Grey	66.3%	4.6%	12.2%	65.0%	4.5%	5.81	5.24			0.76	0.87	N	N	3.3*18m
TNG13-65S	6C TNG13-65S#2	Grey	65.6%	17.1%	24.2%	63.4%	12.5%	5.81	5.24			0.71	0.81	Y	Y	3.3*18m
TNG12-58S	6C TNG12-58S#2	Light Blue	58.2%	12.5%	18.8%	54.9%	9.6%	5.81	5.24			0.66	0.76	Y	Y	3.3*18m
TNG12-51S	6C TNG12-51S#2	Light Blue	50.4%	16.7%	17.6%	44.7%	11.4%	5.81	5.24			0.58	0.67	Y	Y	3.3*18m
TNG12-40S	6C TNG12-40S#2	Grey	40.5%	13.4%	23.2%	38.4%	10.5%	5.81	5.24			0.54	0.62	Y	Y	3.3*18m
TNG15-29S-T	6C TNG15-29S-T#2	Grey	31.0%	28.2%	28.0%	32.1%	20.8%	5.81	5.24			0.47	0.54	Y	Y	3.3*18m
TNG18-20S	6C TNG18-20S#2	Grey	19.3%	48.0%	8.8%	17.9%	33.2%	5.81	5.24			0.33	0.38	N	N	3.3*18m
TNG19-00S	6C TNG19-00S#2	White Sliver	0.4%	50.3%	59.4%	1.1%	42.5%	5.81	5.24			0.19	0.21	N	N	3.3*18m

Solar Control Coating data. Selectivity options across neutral, grey, light blue and white silver families.

SECTION

KAPHS

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Apple Projects

Apple's flagship and global landmark stores — delivered with ultra-large jumbo glass that defines the brand's architectural language.

NORTHGLASS / JUMBO GLASS

Apple Store Sanlitun

LOCATION	CLIENT	ARCHITECT
Beijing — China	Apple	Foster + Partners

Drawing on the vibrant energy of the area, Apple Sanlitun has a porous building envelope that opens out onto all four sides and connects to the multi-layered circulation network. The principal glazed façade facing the central square floods the display areas inside with natural light.

GLASS MAKE-UP

12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST with Low-E (TNG01-89E) + Edge Frit #10 + 16AR + 10 mm LI FT/HST + Edge Frit #11 + 10 mm LI

GLASS SIZE **W. 3,000 × H. 11,000 mm**

NORTHGLASS / JUMBO GLASS

Apple Store Shanghai IFC Mall

LOCATION	CLIENT	ARCHITECT
Shanghai — China	Apple	BCJ

The cylindrical glass tower — surrounded by two large skyscrapers and a substantial circular concrete wall — includes a spiral glass staircase leading to an underground retail space. The transparency of glass brings light into hard-to-reach spaces while the geometry responds specifically to the site conditions.

GLASS MAKE-UP

10 mm LI FT/HST + 1.52 SGP + 10 mm LI FT/HST + 1.52 SGP + 10 mm LI FT/HST + 1.52 SGP + 10 mm LI FT/HST + 1.52 SGP + 10 mm LI FT/HST

GLASS SIZE **W. 2,573 × H. 12,217 mm**

NORTHGLASS / JUMBO GLASS

Apple Store Hong Kong Causeway Bay

LOCATION	CLIENT	ARCHITECT
Hong Kong	Apple	BCJ

This flagship Apple Store is located in Hysan Place Mall in Hong Kong's Causeway Bay district. The three-storey store features a 15-metre-tall glass façade allowing transparent views of all three levels inside. Full-height panels are laterally supported by single-piece fins — the panels and fins are among the largest glass elements produced in the world. Reducing the total number of glass joints maximises optical clarity.

GLASS MAKE-UP

12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST

GLASS SIZE **W. 2,573 × H. 12,217 mm**

NORTHGLASS / JUMBO GLASS

Apple Store Changsha

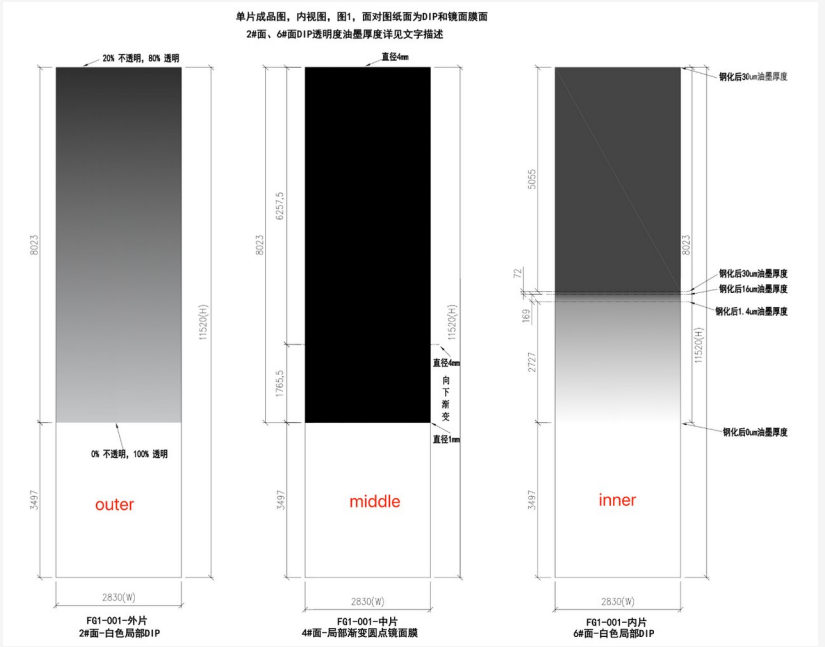
LOCATION	CLIENT	ARCHITECT
Changsha — China	Apple	Foster + Partners

The new Changsha store is located in the popular Changsha IFS shopping mall and faces the bustling Huangxing Road. Visitors encounter a uniquely designed double-height façade featuring a new gradient frit and mirrored coating treatment that blurs the transition from top to bottom and shifts in appearance depending on viewing angle and lighting.

GLASS MAKE-UP

12 mm LI HS + Frit #2 + 1.52 SGP + 12 mm LI HS + Mirror Coating #4 + 1.52 SGP + 12 mm LI HS + Frit #6 + 16A + 8 mm LI HS with Low-E #7 + 1.52 SGP + 8 mm LI HS

GLASS SIZE **W. 2,830 × H. 11,520 mm**



NORTHGLASS / JUMBO GLASS

Apple Park

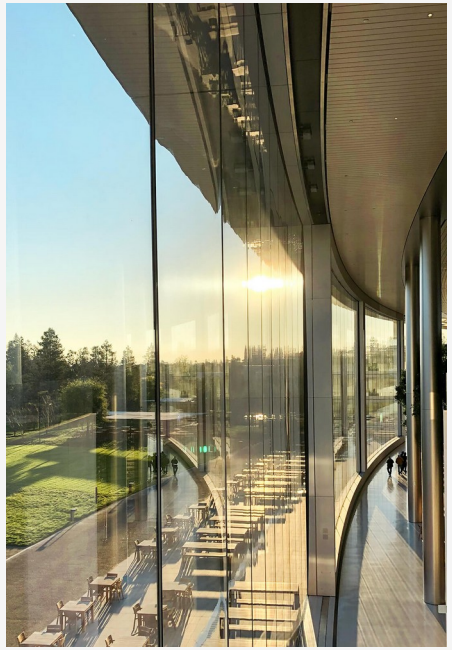
LOCATION	CLIENT	ARCHITECT
California — USA	Apple	Foster + Partners

Apple Park posed a major design challenge with the use of extensive oversized building glass. The largest low-emissivity insulating panels reach 16 metres in height, using the world's most advanced tempering and Low-E coating technology to deliver exceptional strength and energy performance. The project is also recognised as one of Apple's most environmentally advanced buildings.

GLASS MAKE-UP

12 mm LI HS with AP-SC70 #2 + 3.04 SGP + 12 mm LI HS (Cold Bent)

GLASS SIZE **W. 2,712 × H. 15,607 mm**



SECTION

06

Quality Standards

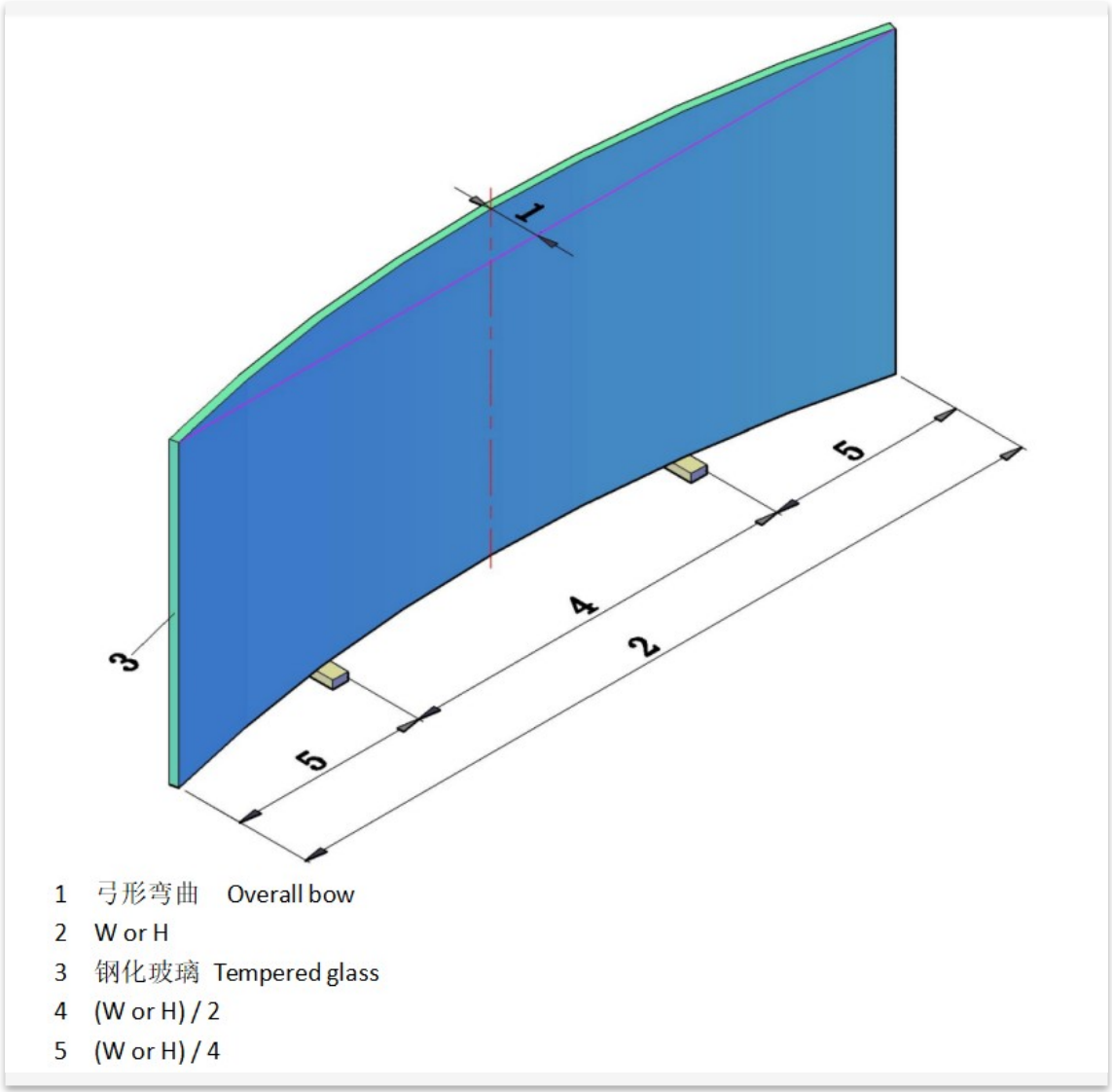
Flatness, distortion, anisotropy and warm-edge IGU technology — the inline standards behind every jumbo panel.

Flatness & Distortion — Overall Bow

Controlled bow tolerances for jumbo tempered panels.

Overall bow describes the deviation of the panel surface from its theoretical plane. NorthGlass tempering lines deliver tight control over this parameter — ensuring jumbo panels remain visually flat once installed.

Bow is measured across both height (H) and width (W) using calibrated straight edges, with measurement points at the centre and at the (W/H) / 2 and (W/H) / 4 positions, as shown opposite.



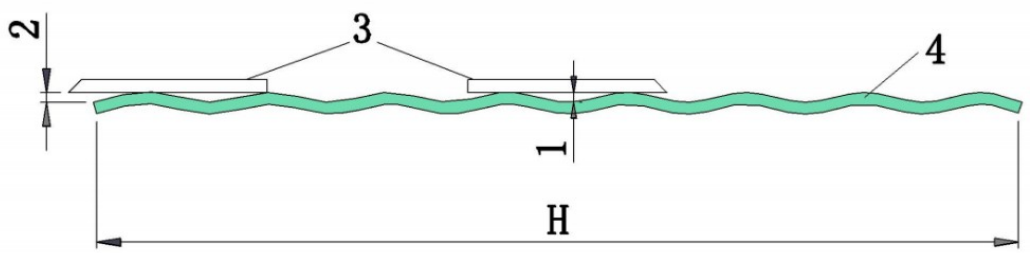
1 弓形弯曲 Overall bow
2 W or H
3 钢化玻璃 Tempered glass
4 (W or H) / 2
5 (W or H) / 4

Roller Wave & Edge Lift

Optical purity across heat-treated jumbo panels.

Roller wave is the periodic surface undulation introduced by tempering rollers. Edge lift describes the slight upward curvature near the panel perimeter. Both directly affect the visual quality of reflective façades.

NorthGlass tempering equipment is engineered to minimise these distortions, producing surfaces that maintain image stability under varying lighting and viewing angles. The diagram shows the inspection method using a straight edge on the tempered glass surface.



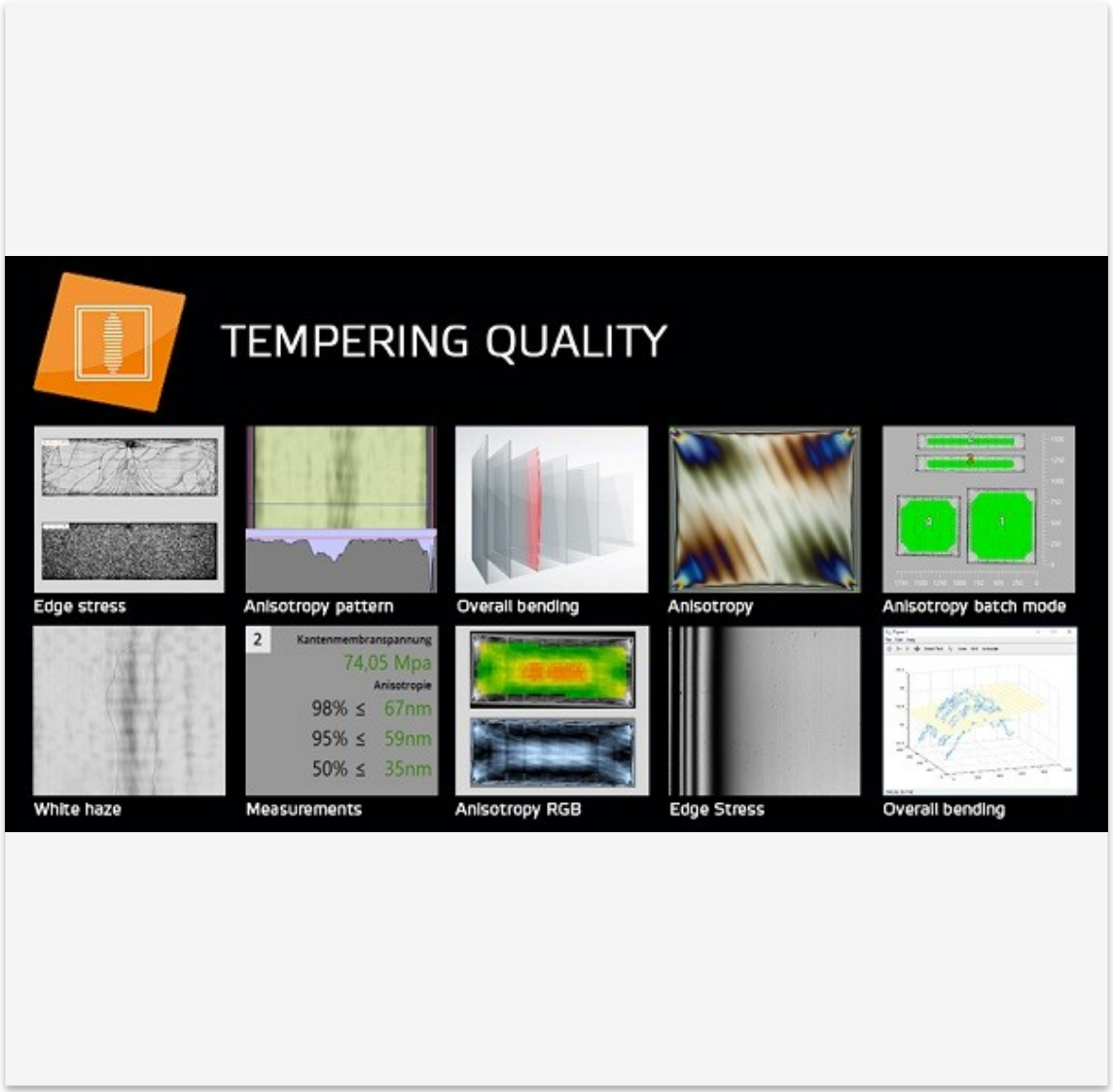
1 波形 Roller wave
2 边部翘曲 Edge lift
3 直尺 Straight edge
4 钢化玻璃 Tempered glass

Inline Anisotropy & Quality Scanner

Every tempered jumbo sheet scanned — 100% inline inspection.

Each tempered panel passes through an inline LineScanner. In a single scanning operation the system records isotropy, edge stress, surface and dimensional quality across the full panel — generating a digital quality record per sheet.

- Isotropy / anisotropy value (%)
- Edge stress (MPa)
- Glass surface — scratches, inclusions, soiling
- Edge quality — conchoidal fractures
- Dimensions, drill holes & cut-outs
- Screen-printing & logo verification

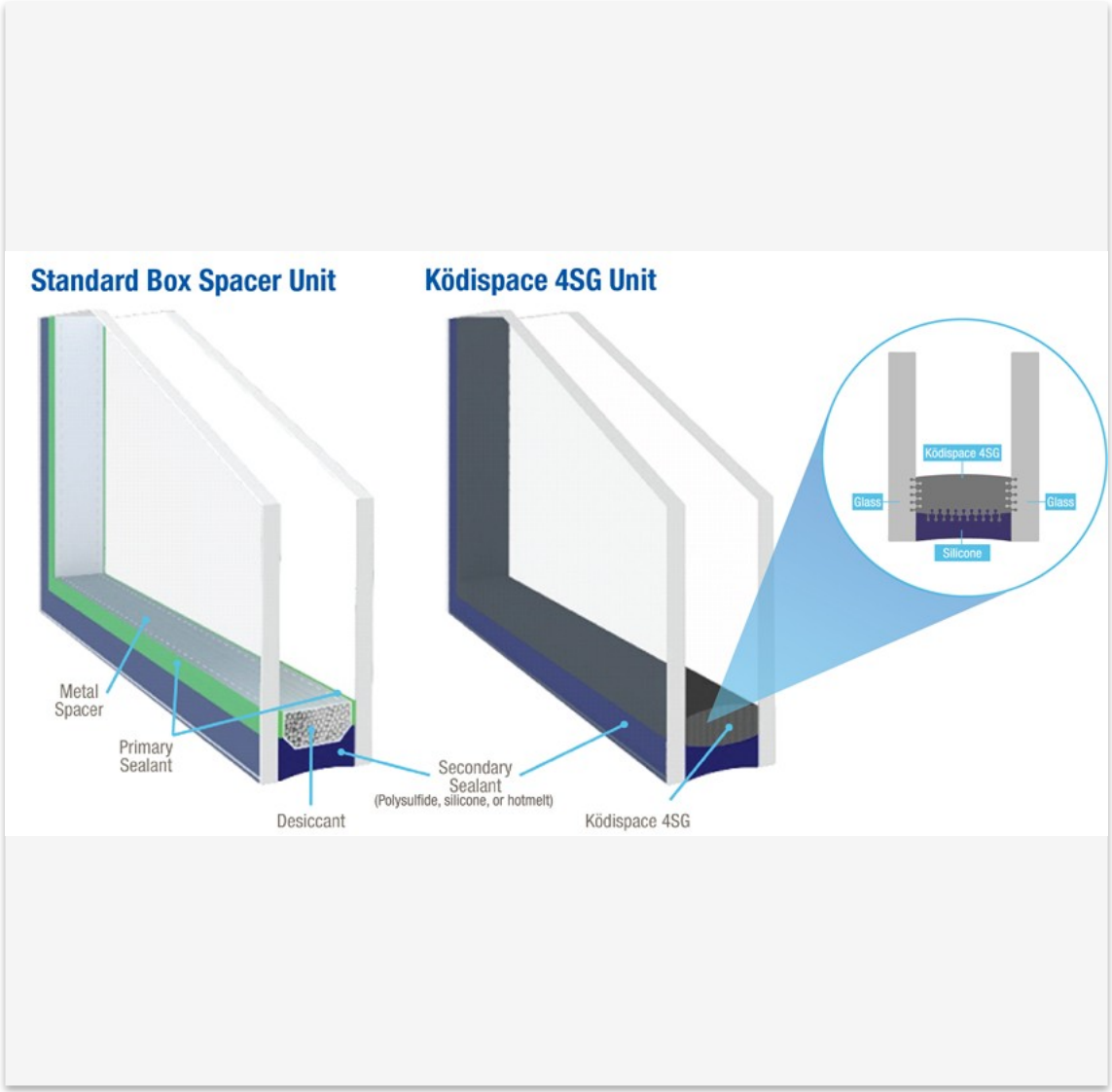


Ködispace 4SG Insulated Glass Units

A thermoplastic warm-edge spacer engineered for jumbo IGUs.

Ködispace 4SG is a reactive thermoplastic warm-edge spacer system with built-in desiccant — completely replacing the traditional edge system of spacer, desiccant and primary seal.

The patented formulation chemically bonds to glass and silicone secondary sealant, eliminating spacer migration. The diagram opposite compares the standard box-spacer unit to the Ködispace 4SG unit.



SECTION

07

Flat Jumbo Glass Projects

Three landmark projects demonstrating the scale and precision of NorthGlass flat jumbo panels.

NORTHGLASS / JUMBO GLASS

Taikang Headquarters

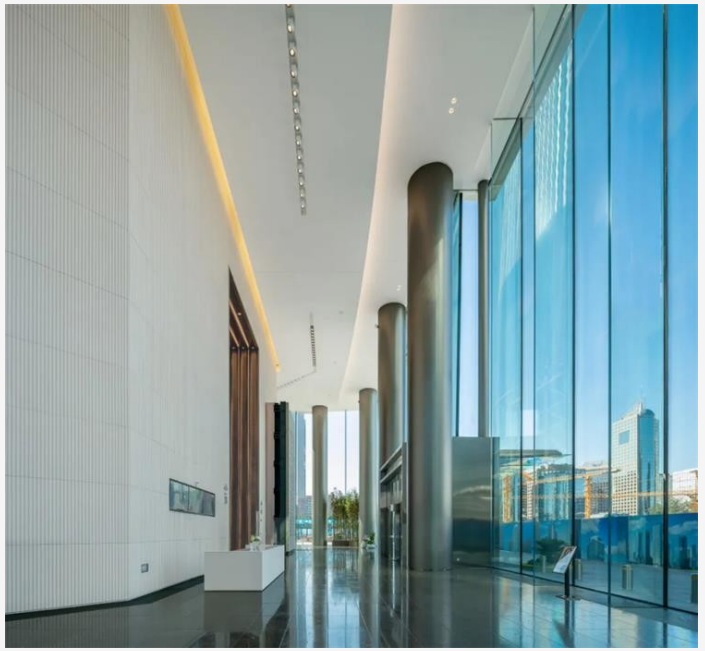
LOCATION	CLIENT	ARCHITECT
Beijing — China	Taikang	Pelli Clarke & Partners / Arup

Tianjin NorthGlass delivered laminated and double-laminated insulating low-E ultra-clear panels at 17.1 m × 3.107 m, each weighing 6.5 t. Unlike most Chinese all-glass curtain walls, the Taikang tower lifts the glass curtain wall above the awning — demonstrating NorthGlass's strength in super-large panel processing.

GLASS MAKE-UP

12 mm LI HS + Edge Frit #2 + 1.52 SGP + 12 mm LI HS with TNG11-69D #4 + 16A + 12 mm LI HS + 1.52 SGP + 12 mm LI HS + Edge Frit #7

GLASS SIZE **W. 2,970 × H. 17,000 mm**



NORTHGLASS / JUMBO GLASS

Anji Culture & Arts Center

LOCATION	CLIENT	ARCHITECT
Zhejiang — China	Anji Construction Group	MAD

Over 7,000 m² of super-large tempered panels for MAD's "Two Mountains" Future Technology City — including a record-breaking 19 m IGU panel weighing 10 t, a 104 mm thick 7-layer laminated structure, and the tallest self-supporting full-glass curtain wall in China to date.

GLASS MAKE-UP

12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST with Low-E #10 + 20A + 12 mm LI FT/HST + 1.52 SGP + 12 mm LI FT/HST

GLASS SIZE **W. 2,437 × H. 14,036 mm**

NORTHGLASS / JUMBO GLASS

Beijing Library

LOCATION	CLIENT	ARCHITECT
Beijing — China	Beijing Library	Snøhetta

The library's extraordinary glass infrastructure is its focal point. The front comprises 276 laminated panels of 2.5 m × 15.3 m, each reinforced with SentryGlas Xtra® (SGX®). Each panel weighs 11.5 t and stacks seven layers of high-performance glass to a combined 133 mm.

GLASS MAKE-UP

15 mm LI FT/HST + Frit #2 + 1.52 SGP + 15 mm LI FT/HST + 1.52 SGP + 15 mm LI FT/HST + 1.52 SGP + 15 mm LI FT/HST + 1.52 SGP + 15 mm LI FT/HST with Low-E #10 + 20AR + 15 mm LI FT/HST + 1.52 SGP + 15 mm LI FT/HST

GLASS SIZE **W. 2,536 × H. 15,300 mm**

SECTION

KAPHS

08

Curved Jumbo Glass

Single curvature and 3D bent panels for fluid, organic envelopes that move beyond the flat façade.

Glass that bends with architectural intent.

Single curvature and 3D geometries — engineered to landmark precision.

Curved Jumbo Glass by NorthGlass enables fluid, organic building forms that move beyond traditional flat façades. Available through KAPHS in the Middle East, these solutions combine large-format production with precision bending technologies for single and complex 3D geometries.

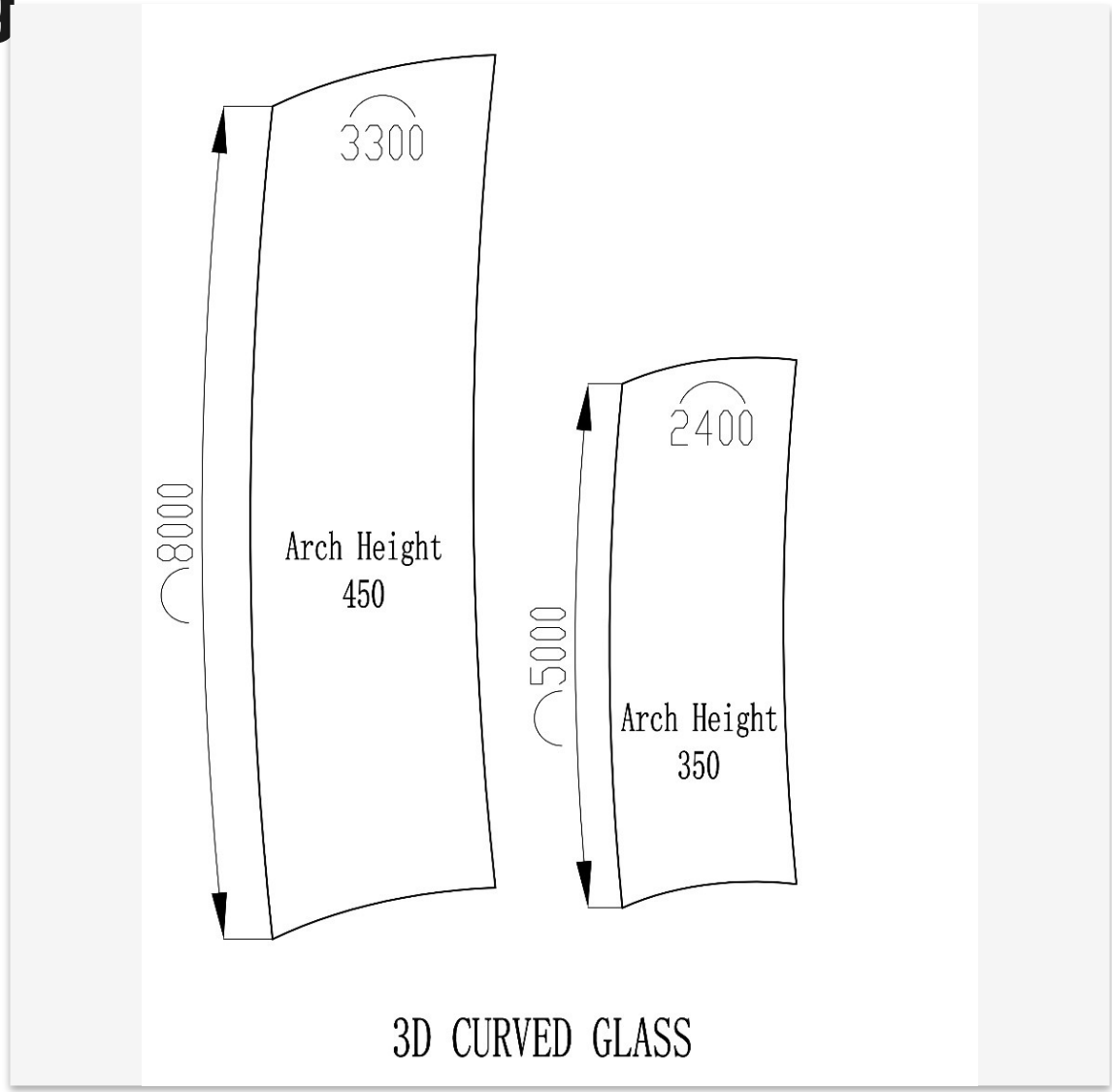
Single Curved Glass is engineered through controlled hot bending — producing smooth, consistent radii across large panels. For more advanced applications, 3D (double) curved glass enables multi-directional curvature for the freeform shapes of iconic architecture. Both can be integrated with tempering, laminating, insulating and Low-E coatings.

3D Curved Glass — Bending Envelope

Arc rise, chord and panel height capabilities for 3D curved jumbo panels.

NorthGlass's 3D curved jumbo glass is produced through precision hot bending, supporting arc rises up to 2,500 mm and panel heights up to 12 m. Minimum bend radius is R 75 mm.

The diagram opposite shows two reference panel geometries from the bending envelope — including chord, height and arc-height parameters that define each curve.



Hot bending at jumbo scale.

Single curved, double curved, insulated, laminated and printed curved glass.

Process	Max Size (mm)
Curved Tempering (Single, Uncoated)	**3,300 × 18,000 mm**
Curved Tempering (Double / Triple Low-E)	**3,200 × 18,000 mm**
Insulated / Laminated Curved Glass	**Custom large-format**
Digital Printed Curved Glass	**3,300 × 18,000 mm**
Ceramic Frit Curved Glass	**Custom large-format**
3D (Double) Curved Glass	**3,300 × 12,000 mm**
Minimum Bend Radius	**R 75 mm**
Maximum Arc Rise	**2,500 mm**

KAPHS

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Curved Glass Accuracy

Shape, twist and cross-curve tolerances — the precision behind every curved jumbo panel.

Shape Accuracy

Radius and chord control on every curved panel.

Shape accuracy describes how closely a curved tempered panel follows the specified radius and chord. NorthGlass curved tempering equipment delivers consistent shape control across long arc lengths and large arc rises.

Each curved panel is measured using template-based methods (Method A) or full-panel comparison (Method B), as shown opposite. Deviation is reported per panel.

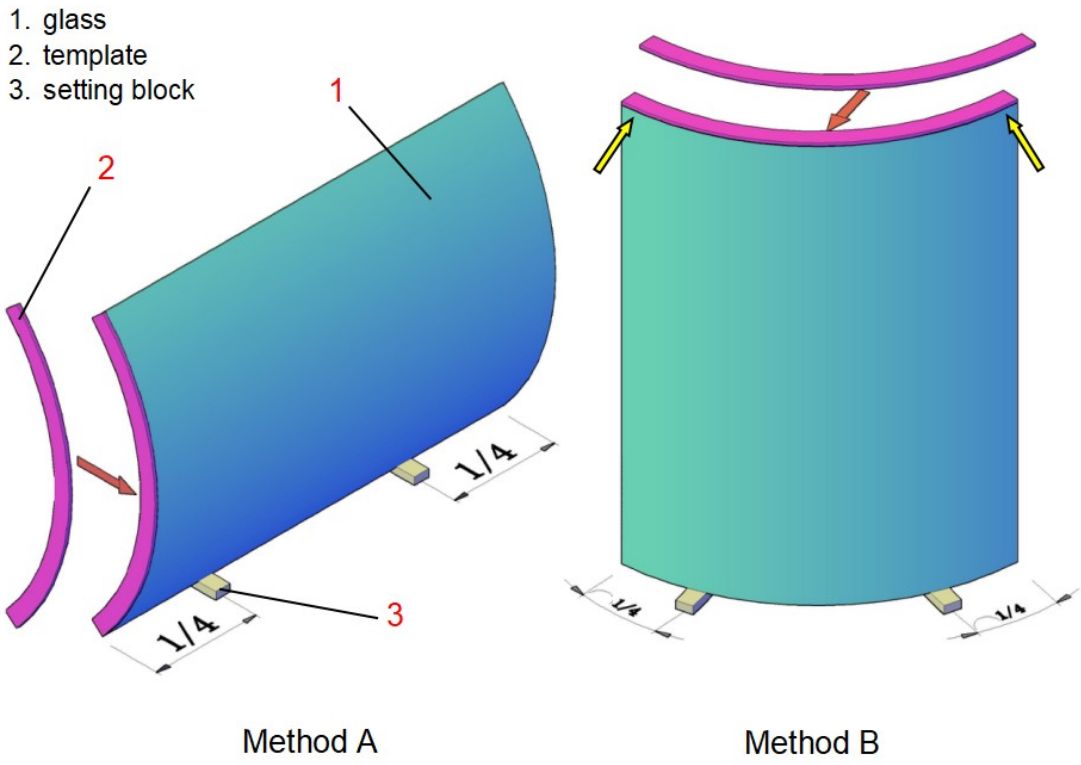


Fig.1 Measurement of shape accuracy tolerance

Twist Accuracy

Controlled twist tolerances on 3D curved panels.

Twist accuracy is critical for 3D bent panels, where uncontrolled twist can introduce installation stress and visual misalignment. NorthGlass controls twist through precision furnace control and mould design.

Maximum twist deviation is measured using template-based (Method A) and edge-line (Method B) reference geometries, as shown opposite.

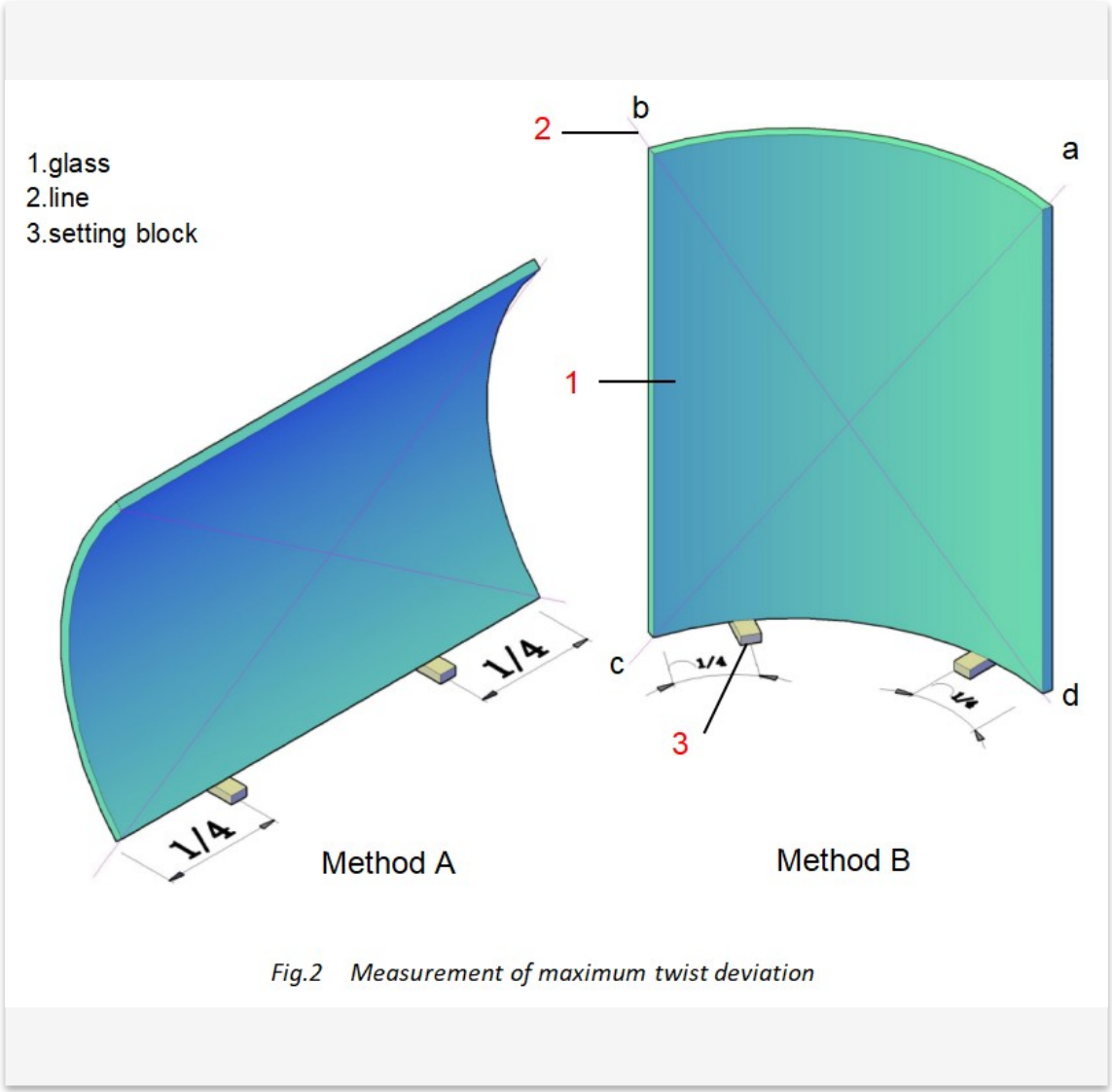


Fig.2 Measurement of maximum twist deviation

Cross-Curve & Edge Bending Accuracy

Edge alignment for clean, sealed installations.

Cross-curve deviation describes the precision of the panel's edge profile relative to its design height. Even on curved geometries, panel edges must align cleanly with adjacent components and silicone joints.

Inline scanning verifies edge geometry, allowing curtain wall contractors to plan installation sequences with confidence. The diagram opposite shows the cross-curve deviation measurement methods (A and B).

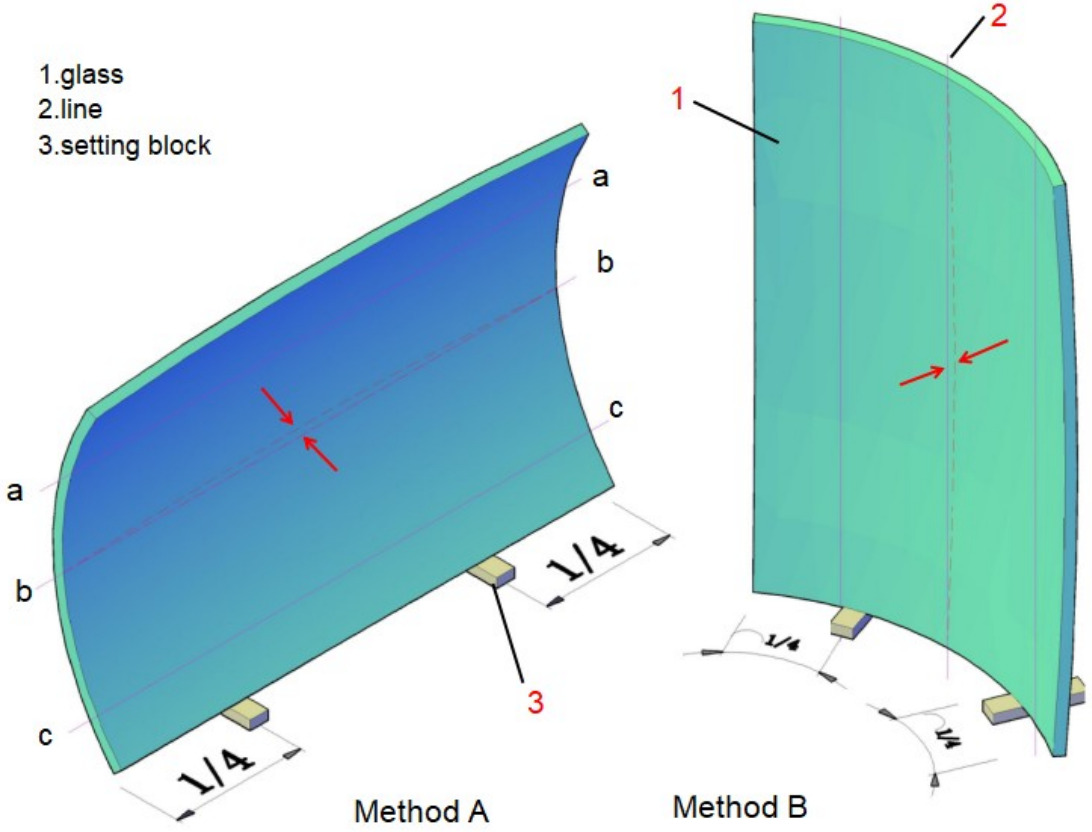


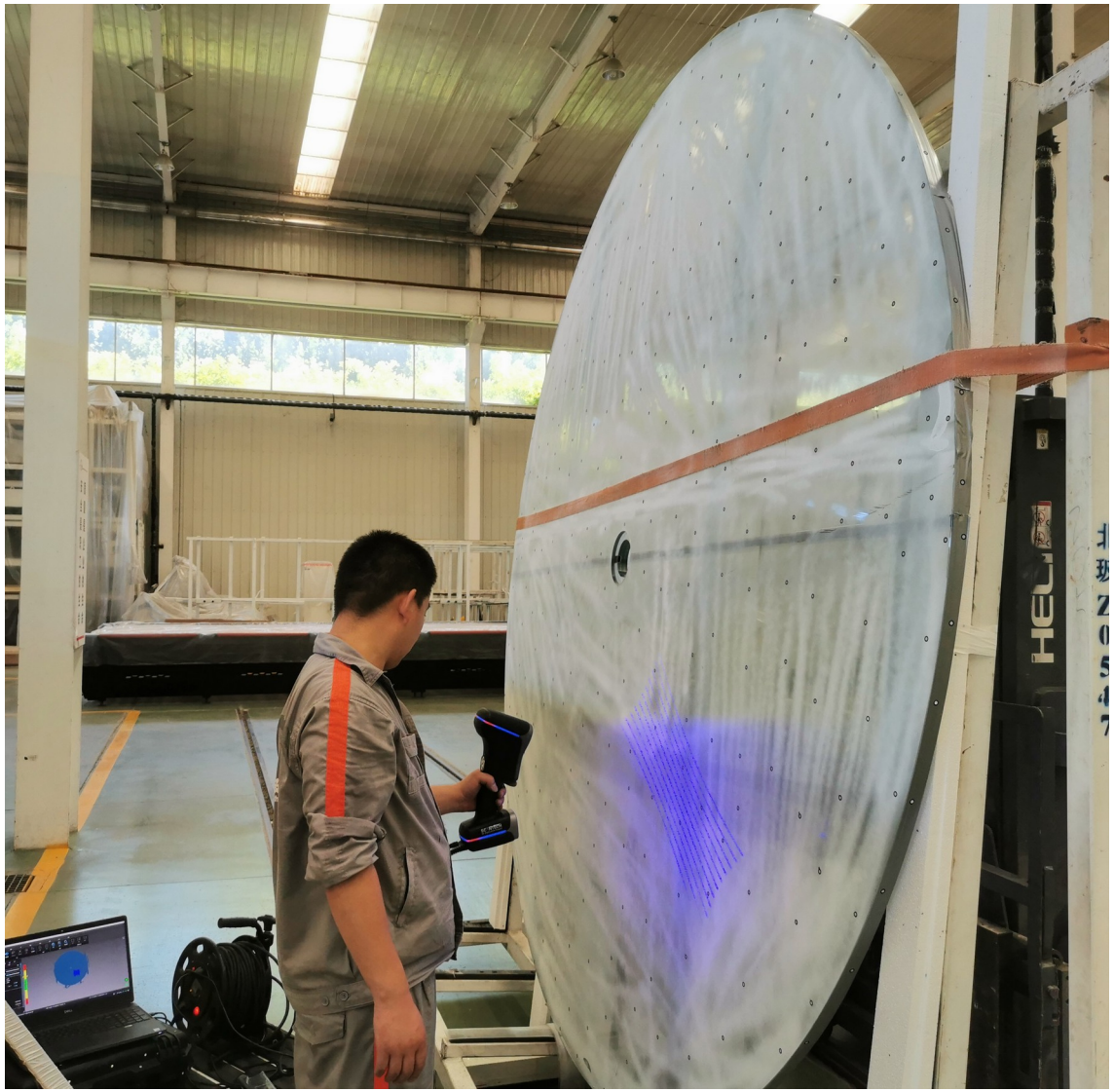
Fig.3 Measurement of maximum cross-curve deviation

3D Scanning

Every curved panel scanned, every result documented.

NorthGlass operates inline 3D scanning across its curved tempering production. Scanned data is compared against the design 3D surface, generating a per-panel quality report covering shape, twist, edge and overall conformity.

This digital record supports project audit trails, façade-level coordination and post-installation traceability — essential on landmark projects with complex geometry and thousands of unique panels.



KAPHS

10

Curved Jumbo Glass Projects

Eight landmark projects — from cylindrical entrances and sail-shaped façades to undulating airport boutiques and stadium ribbons.

NORTHGLASS / JUMBO GLASS

Jing'an Apple Store

LOCATION	CLIENT	ARCHITECT
Shanghai — China	Apple	Foster + Partners

The Apple Jing'an store features a distinctive 15 m arc-length curved tempered glass cylinder entrance that leads visitors into the underground store — a hallmark detail of many Apple stores integrated with the surrounding urban environment.

GLASS MAKE-UP

10 mm LI FT/HST + 1.52 SGP + 10 mm LI FT/HST + Frit #3 + 16A + 10 mm LI FT/HST with Low-E #5 + 3.04 SGP + 10 mm LI FT/HST + Frit #7 (Cold Bent)

GLASS SIZE **W. 7,600 × H. 3,284 mm**

NORTHGLASS / JUMBO GLASS

2050 M Street

LOCATION	CLIENT	ARCHITECT
Washington — USA	Tishman Speyer	REX

978 identical 3,350 mm-tall curved insulated glass units along the building's north and west sides — their compressive strength allowed fabrication without mullions, creating a seamless appearance. A high-performance Low-E coating improves energy efficiency while adding a distinctive aesthetic.

GLASS MAKE-UP

6 mm LI HS + 1.52 PVB + 6 mm LI HS with Low-E #4 + 16A + 8 mm Clear HS with Low-E #5 Curved

GLASS SIZE **W. 1,500 × H. 3,200 mm**

NORTHGLASS / JUMBO GLASS

New Performing Arts Venue

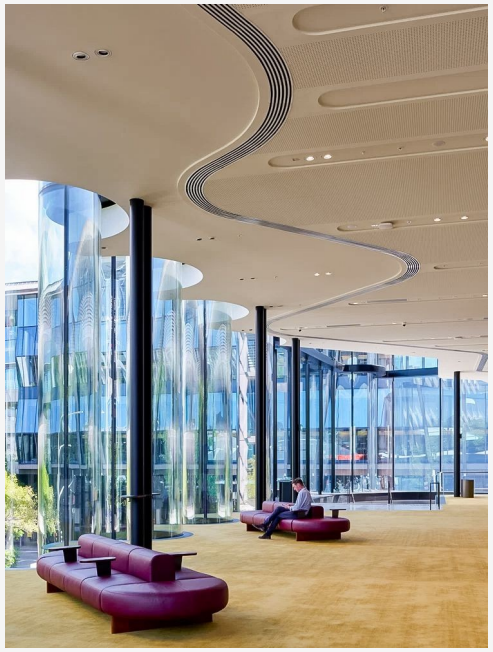
LOCATION	CLIENT	ARCHITECT
Brisbane — Australia	QPAV	Snøhetta

The new theatre at the Queensland Cultural Centre carries a bespoke curved glass façade of 2,400 m² across 217 panels. The fully suspended façade reaches 14.28 m, with the largest panel weighing nearly 2.4 tonnes — installed using robust engineering and safety controls.

GLASS MAKE-UP

10 mm LI HS + 1.52 SGP + 10 mm LI HS with Low-E #4 + 12AR + 10 mm LI HS + 1.52 SGP + 10 mm LI HS Curved

GLASS SIZE **W. 1,000 × H. 7,000 mm**



NORTHGLASS / JUMBO GLASS

Louis Vuitton Kansai Airport

LOCATION	CLIENT	ARCHITECT
Osaka — Japan	Louis Vuitton	OMA

Louis Vuitton's first standalone airport boutique in Japan, located airside on the second floor of Terminal 1. The store is set apart by a striking undulating curved glass façade that breaks the monotony of typical airport retail environments.

GLASS MAKE-UP

6 mm LI FT/HST + Frit #1 + 2.28 SGP + 6 mm LI FT/HST Curved

GLASS SIZE

W. 900 × H. 4,000 mm

NORTHGLASS / JUMBO GLASS

National Speed Skating Oval

LOCATION	CLIENT	ARCHITECT
Beijing — China	Beijing State Asset Management	Populous

The "Ice Ribbon" features a striking exterior of 3,360 curved and flat glass panels designed to resemble 22 flowing ribbons of ice. Ultra-clear, laminated, insulating glass with double silver Low-E coating defines the iconic stadium envelope.

GLASS MAKE-UP

6 mm LI Semi-Bent + 1.52 SGP + 6 mm LI Semi-Bent + Frit #4

GLASS SIZE

R. 175 mm (small-radius curved)

NORTHGLASS / JUMBO GLASS

Changfeng Mixed-Use Development

LOCATION	CLIENT	ARCHITECT
Shanghai — China	SKI Development	Foster + Partners

Foster + Partners' Changfeng development in Shanghai's Putuo District. The upper façades use tubular curved glass with stainless-steel back panelling that can be illuminated at night. Lower volumes incorporate horizontal canopies and vertical fins to optimise energy efficiency.

GLASS MAKE-UP

8 mm LI HS + 1.52 SGP + 8 mm LI HS Curved

GLASS SIZE

W. 880 × H. 4,000 mm

NORTHGLASS / JUMBO GLASS

Louis Vuitton Osaka

LOCATION	CLIENT	ARCHITECT
Osaka — Japan	Louis Vuitton	Jun Aoki & Associates

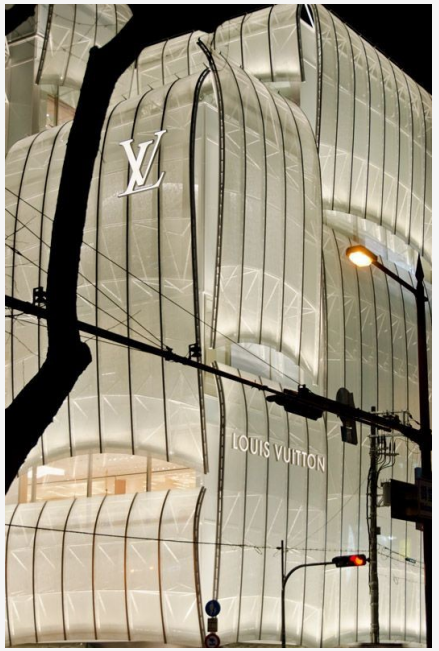
The Louis Vuitton Osaka façade references sails as its design metaphor. The building is covered by ten sails whose 3D airfoil shapes are composed of 2D curved glass panels — each double-glazed with a white-cloth ceramic frit pattern that neutralises glass colour.

GLASS MAKE-UP

8 mm LI HS + Frit #1 + 1.52 SGP + 8 mm LI HS

GLASS SIZE

W. 3,000 × H. 6,560 mm



NORTHGLASS / JUMBO GLASS

Oppo Headquarters

LOCATION	CLIENT	ARCHITECT
Shenzhen — China	Oppo	Zaha Hadid Architects

A landmark by Zaha Hadid Architects at the Shenzhen Bay Super Headquarters Base. NorthGlass is supplying approximately 70,000 m² of high-performance glass, including 14,000 custom curved panels — of which more than 9,000 are highly complex multi-curved units showcasing advanced manufacturing precision.

GLASS MAKE-UP

10 mm LI HS with Solar Control Coating #2 + 2.28 SGP + 10 mm LI HS with Low-E #4 + 16A + 10 mm LI HS + 2.28 SGP + 10 mm LI HS Curved

GLASS SIZE **W. 1,200 × H. 11,000 mm**

KAPHS

11

Middle East Projects

Landmark glass façades delivered across the GCC — from Dubai's flagship retail to Abu Dhabi's new airport and Kuwait's iconic banking tower.

NORTHGLASS / JUMBO GLASS

Apple Store Dubai Mall

LOCATION	CLIENT	ARCHITECT
Dubai — UAE	Apple	Foster + Partners

Located in Dubai Mall — one of the most visited urban centres in the world, attracting over 80 million visitors a year — the new Apple Dubai Mall sits alongside the Burj Khalifa and overlooks the Dubai Fountains. Spanning two floors, it embraces the theatre of the fountains with a sweeping 56.6 m wide and 5.5 m deep terrace — a first for any Apple Store — delivering unparalleled views of the choreographed display.

GLASS MAKE-UP

12 mm LI HS + 1.52 SGP + 10 mm LI HS with Low-E #4 + 18AR + 12 mm LI HS + 1.52 SGP + 12 mm LI HS Curved

GLASS SIZE **W. 2,573 × H. 12,217 mm**

NORTHGLASS / JUMBO GLASS

Zayed International Airport

LOCATION	CLIENT	ARCHITECT
Abu Dhabi — UAE	Abu Dhabi Airports	Kohn Pedersen Fox

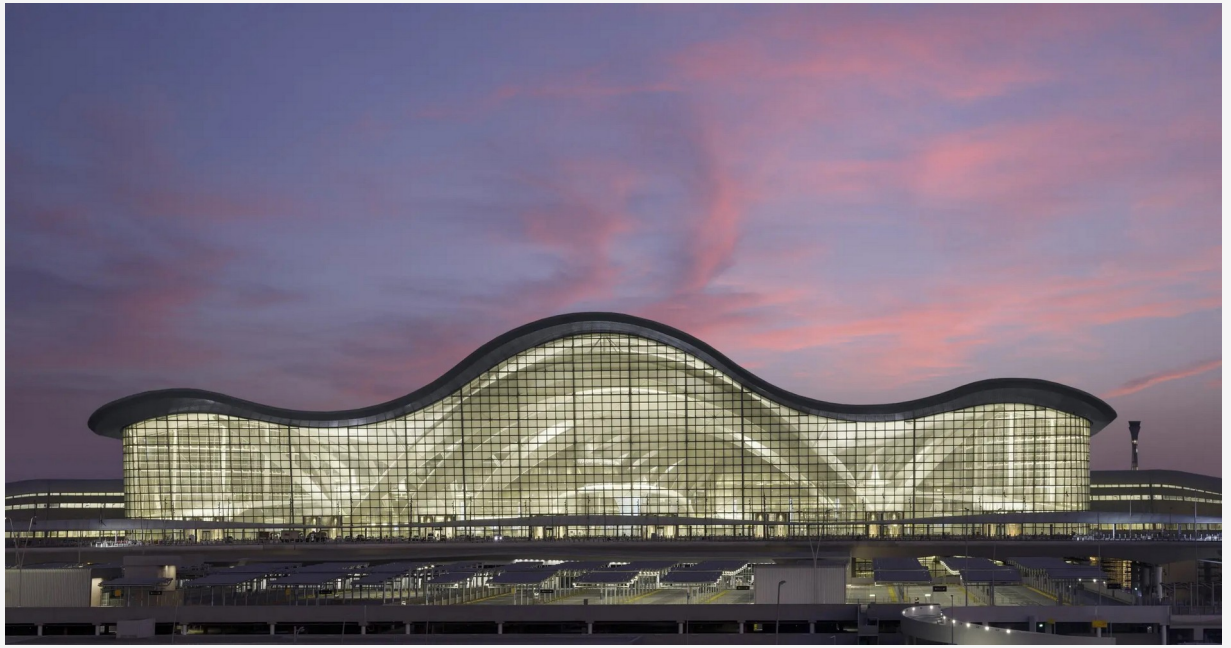
NorthGlass supplied curved and coated jumbo panels for the terminal envelope, working with Guardian Glass's SunGuard™ SuperNeutral™ 40/23 HT — a high-selectivity coating offering 40% VLT, low solar heat gain (g 0.23) and U-value of 1.0 W/m²K. NorthGlass led the bending process with Guardian's technical support, delivering panels suited to the intense desert setting while maintaining a neutral terminal ambiance.

GLASS MAKE-UP

6 mm Clear HS + Edge Frit #2 + 1.52 SGP + 6 mm Clear HS with Low-E #4 + 12A + 6 mm Clear HS + Frit #5 + 3.04 SGP + 6 mm Clear HS + Frit #7

GLASS SIZE

Large-format curved façade



NORTHGLASS / JUMBO GLASS

The Mobility Pavilion (Alif)

LOCATION	CLIENT	ARCHITECT
Dubai — UAE	Expo 2020	Foster + Partners

The Mobility Pavilion — named Alif after the first letter of the Arabic alphabet, symbolising the beginning of progress and new horizons — occupies a dedicated plaza at the south entrance of the Expo 2020 site. Its ribbed and curved shape was designed to evoke movement; the highly reflective stainless-steel cladding, inspired by chrome fenders and aircraft wings, reflects motion from the surrounding plaza, making the building seem alive.

GLASS MAKE-UP

8 mm LI HS + 1.52 PVB + 8 mm LI HS with Low-E #4 + 20AR + 8 mm LI HS

GLASS SIZE

Curved insulated façade panels

NORTHGLASS / JUMBO GLASS

National Bank of Kuwait

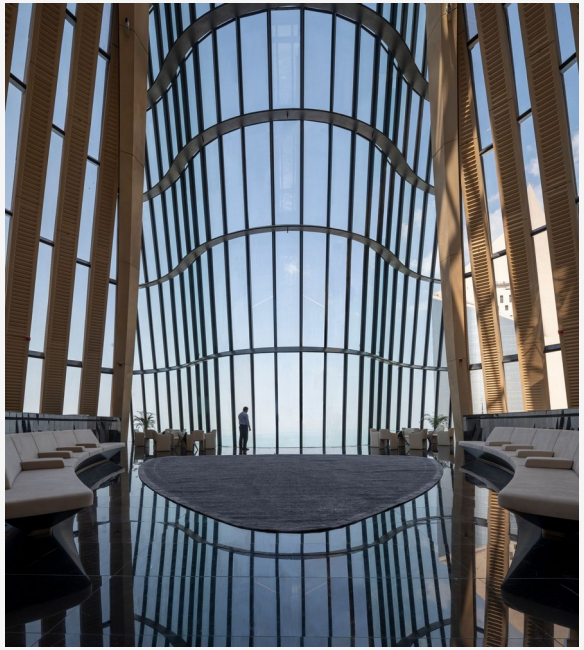
LOCATION	CLIENT	ARCHITECT
Kuwait City — Kuwait	NBK	Foster + Partners

The tower's cylindrical form opens like a shell to the north to avoid solar gain, revealing views of the Arabian Gulf. The southern façade is shaded by a series of concrete fins extending the full height of the tower — providing structural support, reducing solar exposure and evoking the form of the dhow sailing boat, a reference to Kuwait's roots in maritime trade. The tapered base maximises floor space at the top while promoting self-shading.

GLASS MAKE-UP

8 mm LI HS with Low-E #2 + 1.52 PVB + 8 mm Clear HS with Low-E #4 + 16AR + 6 mm Clear HS + 1.52 PVB + 6 mm Clear HS

GLASS SIZE **W. 2,175 × H. 7,989 mm**



NORTHGLASS / JUMBO GLASS

Palm Flower

LOCATION	CLIENT	ARCHITECT
Dubai — UAE	Alpago	Foster + Partners

Palm Flower is a striking residential building located on the 'trunk' of the Palm Jumeirah in Dubai — the last remaining plot to be developed along the two-kilometre stretch, making it one of the most exclusive new addresses in the city. Residents access the double-height lobby via an elevated drop-off, creating a sense of arrival and uninterrupted views across the water. Private lifts take residents directly from the lobby to their apartments, each spanning the entire floorplate — expansive living spaces framed against a backdrop of sea and sky.

GLASS MAKE-UP

6 mm LI HS with Solar Control Coating #2 + 1.52 SGP + 6 mm LI HS with Low-E #4 + 16AR + 8 mm LI FT/HST + Frit #5

GLASS SIZE

Bespoke curved residential glazing

Engineered to specification.

Each NorthGlass jumbo panel can be specified across substrates, thicknesses, make-ups and finishes — supporting bespoke façade and interior projects in the Middle East and the world's most demanding climates.

Substrates

- Low Iron (Optiwhite)
- Standard float
- Heat-soaked tempered (HST)
- Ceramic frit

Thicknesses

- 6 mm / 8 mm / 10 mm
- 12 mm / 15 mm
- Multi-laminated up to 133 mm
- Custom on request

Make-ups

- Tempered (FT) / Heat-Soaked
- SGP / PVB laminated
- Insulated (Air / Argon)
- Curved / 3D bent

Finishes

- Low-E (Single / Double Silver)
- Solar Control coatings
- Ceramic frit / digital print
- Anti-reflective on request

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GET IN TOUCH

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