

ARCHITECTURAL FORM | TOUGHENED | HEAT STRENGTHENED | EN 12150 | EN 1863 | ASTM C1048

Curved Heat Treated Glass

Fluid Form. Engineered Strength. Architectural Freedom.

IPH Glasses processes curved toughened and heat-strengthened glass for architects and designers who demand both aesthetic freedom and structural performance — from cylindrical facades and circular atriums to curved balustrades and sculptural canopies.

PRODUCT CATEGORY

Architectural Form
Toughened
Heat Strengthened
EN 12150
EN 1863
ASTM C1048

AUTHORIZED DISTRIBUTOR

Guardian Glass | Saint-Gobain
Kuraray | Technoform | Fenzi

PRODUCT OVERVIEW

Curved Heat Treated Glass

Where architectural form meets engineered structural performance.

Curved heat-treated glass is manufactured by heating flat glass to its softening point, forming it over a precision mould, then rapidly cooling it through the heat treatment process. The result is either **Fully Tempered Curved Glass** (69–110 MPa, 4–5× strength) or **Heat Strengthened Curved Glass** (30–52 MPa, 2× strength) — enabling fluid architectural forms without sacrificing safety, thermal, or structural performance.

FT: 69–110 MPa

Fully tempered surface stress

HS: 30–52 MPa

Heat strengthened surface stress

5–12 mm

Thickness range

2850 × 6000 mm

Maximum panel size

PRODUCT TYPES

Heat Treatment Classification

Property	Curved Fully Tempered	Curved Heat Strengthened
Surface Stress	69–110 MPa (10,000–16,500 psi)	30–52 MPa (4,300–7,500 psi)
Strength vs Annealed	4–5× stronger	2× stronger
Breakage Pattern	Small, blunt fragments — safe breakage	Large fragments — retained better in laminates
Lamination	Suitable — standalone safety glass	Preferred for overhead laminated applications
Standards	EN 12150 ASTM C1048 FT IS 2553 AS/NZS 2208	EN 1863 ASTM C1048 HS AS/NZS 2208 (as laminate)
Primary Applications	Facades, balustrades, partitions	Curved overhead laminated glazing, structural canopies

TECHNICAL DATA

Technical Specifications

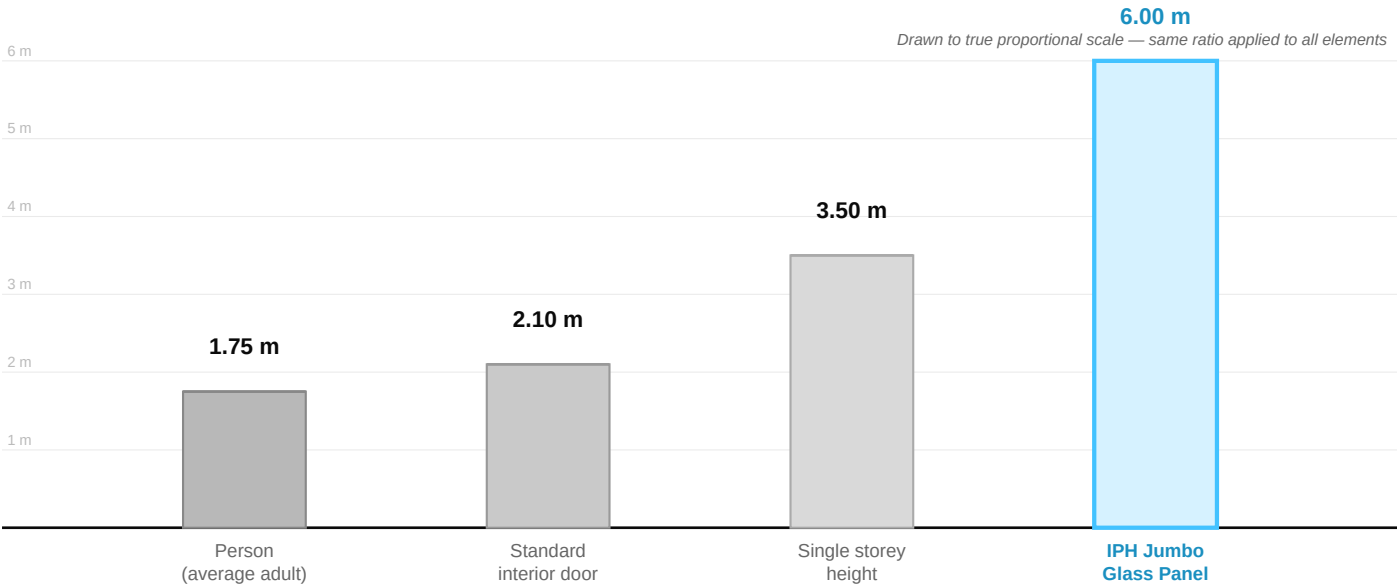
Parameter	Specification
Process Type	Horizontal Roller — Forced Convection Furnace (with precision bending)
Glass Substrate Types	Clear, Extra Clear, Ultra Clear, Tinted, Solar-Control Coated, Low-E Coated
Surface Treatments	Ceramic Frit, Digital Printing, Sandblasting, Acid Etching — applied pre-bending
Upgrade Path	Curved Insulated Glass Unit Curved Laminated Glass
Thickness Range	5 mm / 6 mm / 8 mm / 10 mm / 12 mm
Maximum Dimensions	2,850 mm × 6,000 mm (subject to radius and thickness)

Edge Finishes	Rough Grind Arrissed Super Polished
Curve Type	Single-axis cylindrical (standard) Compound curves (project-specific feasibility)
FT Surface Stress	69 MPa – 110 MPa (10,000 – 16,500 psi)
HS Surface Stress	30 MPa – 52 MPa (4,300 – 7,500 psi)
Coating Emissivity	Minimum 0.01 (with low-E coated substrates)

MAXIMUM DIMENSIONS

Jumbo Glass Capability & Scale

IPH Glasses processes panels up to **2,850 mm × 6,000 mm** — enabling large, uninterrupted glass surfaces that reduce joint lines and elevate the visual quality of architectural facades, atriums, and interior spaces. The scale diagram below is drawn to true proportion: every bar uses the same fixed scale factor.



Maximum panel width: 2,850 mm — shown separately from height, as glass panels are supplied to project-specific width and height combinations up to these maximum dimensions.

Reference Object	Typical Dimensions	How IPH Glass Compares
Standard interior door	900 × 2,100 mm	IPH panel height is 2.9× a standard door height
Typical floor-to-floor height	3,000 – 3,600 mm	A single IPH panel can span the full floor-to-ceiling height in one piece
Average adult height	~1,750 mm	IPH panel height is 3.4× the height of an average adult
ISO shipping container height	2,591 mm	IPH panel height is 2.3× the height of a standard shipping container
Maximum panel width (separate dimension)	2,850 mm	Width and height are supplied independently up to these maximums, in project-specific combinations

- At 2,850 × 6,000 mm, IPH curved glass panels span full double-storey heights in a single continuous curved surface.
- Minimum bending radius depends on glass thickness — contact IPH Glasses with your target radius and thickness for confirmation.
- Surface treatments including ceramic frit and digital printing are applied to flat glass before the bending and heat treatment process — ensuring they are permanently fused.

STANDARDS & COMPLIANCE

Applicable Standards

IPH Glasses processes and supplies this product in compliance with the following Indian (IS/BIS), European (EN/ISO), American (ASTM/UL/NIJ), and Australian/New Zealand (AS/NZS) standards:

Standard Code	Title & Scope
Indian Standards — Bureau of Indian Standards (BIS)	
IS 2553 Part 1 : 1990	Safety glass — General requirements (curved fully tempered) (India)
IS 14900 : 2000	Transparent float glass — Specification (India)
European Standards — CEN	
EN 12150-1 : 2015	Glass in building — Thermally toughened soda lime silicate safety glass — Definition and description (curved FT)
EN 12150-2 : 2004	Glass in building — Thermally toughened safety glass — Evaluation of conformity (curved FT)
EN 1863-1 : 2011	Glass in building — Heat strengthened soda lime silicate glass — Part 1: Definition and description (curved HS)
EN 1863-2 : 2004	Glass in building — Heat strengthened soda lime silicate glass — Part 2: Evaluation of conformity (curved HS)
EN 572-1 : 2012	Glass in building — Basic soda lime silicate glass products — Definitions
EN 1279-1 : 2018	Glass in building — Insulating glass units (for curved IGU upgrade)
European Standards — CEN / ISO	
EN ISO 12543-1 : 2011	Glass in building — Laminated glass — Definitions (for curved laminated upgrade)
ASTM International — USA	
ASTM C1048 : 2018	Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass — Kind FT and Kind HS
ASTM C1036 : 2016	Standard Specification for Flat Glass
ASTM E1300 : 2016	Standard Practice for Determining Load Resistance of Glass in Buildings
Australian / New Zealand Standards — Standards Australia / SNZ	
AS/NZS 2208 : 1996	Safety glazing materials in buildings
AS 1288 : 2006	Glass in buildings — Selection and installation
AS/NZS 4667 : 2000	Quality requirements for cut-to-size and processed glass

ARCHITECTURAL APPLICATIONS

Applications

Curved Building Facades

Cylindrical towers, curved retail fronts, and radius-planned buildings — continuous curved glass facades.

Circular Atriums & Lobbies

Curved glass walls and cylindrical glazed lift shafts — where the glass form is the primary architectural element.

Curved Balustrades & Railings

Staircase balustrades, circular mezzanines, and sweeping ramp balustrades in premium projects.

Architectural Canopies

Curved glass entrance canopies and porticos — weather resistance and architectural identity.

Retail & Hospitality Shopfronts

Curved glass shopfronts for luxury retail, hotel lobbies, and restaurant entrances.

Interior Feature Walls

Curved glass partitions, wine display walls, and architectural screen elements in luxury interiors.

COMPARISON

Product Comparison

Performance Attribute	Standard Float Glass	Curved Heat Treated Glass
Form Capability	✗ Flat glass only — no curved form possible	✓ Single and compound curves achievable — any radius
Breakage Safety	✗ Annealed: sharp shards — major safety risk	✓ FT: small safe fragments HS: large fragments retained in laminates
Structural Strength	✗ Baseline only	✓ 2–5× stronger depending on heat treatment grade
Coating Compatibility	✗ Limited options for curved glass	✓ Solar control, low-E, ceramic frit — all compatible
Upgrade Path	✗ No upgrade available for curved glass	✓ Curved Insulated Glass and Curved Laminated Glass available
Standards Compliance	✗ No heat treatment standard	✓ EN 12150 EN 1863 ASTM C1048 IS 2553 AS/NZS 2208

MANUFACTURING EXCELLENCE

Quality Assurance

Every panel processed at IPH Glasses passes through a structured, multi-stage quality control process — from incoming raw material to final pre-dispatch inspection.

Raw Material Verification

Incoming float glass and component materials (interlayers, spacers, sealants) are checked against supplier specification before entering production.

Process-Controlled Manufacturing

Furnace temperature, cooling rate, lamination pressure, and IGU assembly parameters are monitored and logged at each processing stage.

Optical Quality Inspection

Glass surfaces are visually inspected for distortion, bow, roller wave, and coating defects prior to dispatch.

Dimensional Accuracy Checks

Panel dimensions, squareness, and thickness are verified against project specification tolerances.

Edge Quality Inspection

Edge finish (rough grind, arressed, or super polished) is checked for consistency and conformance to the specified finish.

Toughening Process Validation

Surface compressive stress and fragmentation pattern are verified on sample panels from each production batch to confirm heat treatment compliance.

Batch Traceability

Production records link each panel batch to its raw material source, processing parameters, and quality check results.

Final Pre-Dispatch Sign-Off

A final inspection is carried out before packing and dispatch, confirming the panel meets project specification and IPH Glasses' internal quality criteria.

OUR CAPABILITY

Why Choose IPH Glasses?

IPH Glasses — operating as Mahavir Glass Enterprise — is one of Gujarat's most trusted architectural glass processors and authorized distributors for Guardian Glass and Saint-Gobain. We serve architects, developers, facade consultants, and PMC teams from our facility in Kheda, Gujarat.

Authorized Distributor

Guardian Glass and Saint-Gobain — certified supply chain, authentic products with full traceability.

Advanced Processing

Horizontal roller furnace, autoclave lamination, and fully automatic IGU assembly line.

Complete Product Range

Toughened, laminated, insulated, digital printed, curved, anti-burglar, and bullet-resistant glass — all from one processor.

Technical Support

In-house team for glass selection, specification writing, performance calculations, and full project delivery support.

Multi-Stage Quality Control

Raw material verification, in-process inspection, optical and dimensional accuracy checks, and final pre-dispatch quality sign-off on every batch.

Export Experience

Supplying projects across India, East Africa, Congo, Sri Lanka, and expanding international markets.

CONTACT & TECHNICAL SUPPORT

Get in Touch

Head Office & Factory	Sales & Technical	Digital Presence
IPH Glasses Mahavir Glass Enterprise Kheda, Gujarat — India	+91 70690 01101 mktg@iphglASSES.com Sales: Shalin Shah	www.iphglASSES.com linkedin.com/company/iphglASSES instagram.com/iphglASSES

Our technical team is available to assist with glass selection, specification writing, performance calculations, and project-specific requirements. Contact us to schedule a technical consultation or to request samples and project pricing.

This catalogue is for reference purposes. Specifications subject to change. Consult IPH Glasses technical team for project-specific recommendations.