

TPRS LAMISAFE

SAFE AND AESTHETIC LAMINATED GLASSES

DIGITAL CATALOGUE

kuraray

CERTIFIED PROCESSOR



Trust TPRS to explore Glass

TPRS GLASS (SINCE 2005)



TPRS - QSPI

QUALITY SERVICEABILITY PROFESSIONALISM INNOVATION

We are a trusted Architectural, Automobile, Elevator and Escalator Glass solutions provider in India. We hold maximum market share in Automobile OE segment, Architectural segment, Interior segment and Elevator segment. We also export Automobile and Architectural glasses to UAE, UK, African and Asian countries.

TPRS is a 1000+ member family and we specialise in toughened safety glass, laminated safety glass, screen printed safety glass, digitally printed safety glass and insulated glasses for Architectural, Automotive Elevators and Escalators segment. We have obtained necessary certifications viz. ISO 9001 : 2015, E Marking, IATF 16949, COP, ISI 2553 Part I & II, CE Marking, AS 1288:2006, DOW Corning Quality Bond Certification.

We have many established laboratories in which all the testings are conducted in line with required standards. We support rapid new product development, supply quality products and adhere to delivery commitments and we value our customer satisfaction which is a driving force in all walks of our development.



Trust TPRS to explore Glass

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INTRODUCTION

PROCESS INVOLVED

CUTTING – PREPROCESSING – HEAT TREATMENT - LAMINATION



CUTTING

Cutting based on drawing and templates

PROCESSING

Polishing – Chamfering – Holes – Cutout –
Toughening - Heat strengthened

LAMINATION

Die - Bend – Washing – Layup – Nip-roller /
Vacuum chamber - Autoclave

WHY TPRS LAMISAFE ?

WHY LAMINATED GLASS – WHY LAMISAFE



WHY LAMINATED GLASS

High safety

01

High
strength

03

Sound Proof

02

Burglar
Resistance

04

UV
Resistance

05

WHY TPRS LAMISAFE ?



ADVANCE FACILITY

Clean room facility for layup and storage
7 MIDI, 2 Vacuum chambers, 1 Autoclave



TOP NOTCH QUALITY

You can simply impress
your audience and add a
unique zing.



RANGE OF PRODUCTS

TPRS has various collections of
products



ECO-FRIENDLY

Reduces noise and eco-
friendly raw materials



ENDLESS GLASS SOLUTIONS

With inhouse development team, TPRS is
equipped with various expertise to provide
various range of solutions



TPRS LAMISAFE

LAMINATION CAPABILITIES

- ❖ Customized bend lamination
- ❖ SGP interlayer for effective impact resistance
- ❖ TPRS Wizard glass – Switchable glass
- ❖ Color and transparent laminated panels
- ❖ Mesh laminated panels

CAPACITY

Maximum lamination of
2300 mm × 4700 mm with PVB / SGP – Double / Multi layer

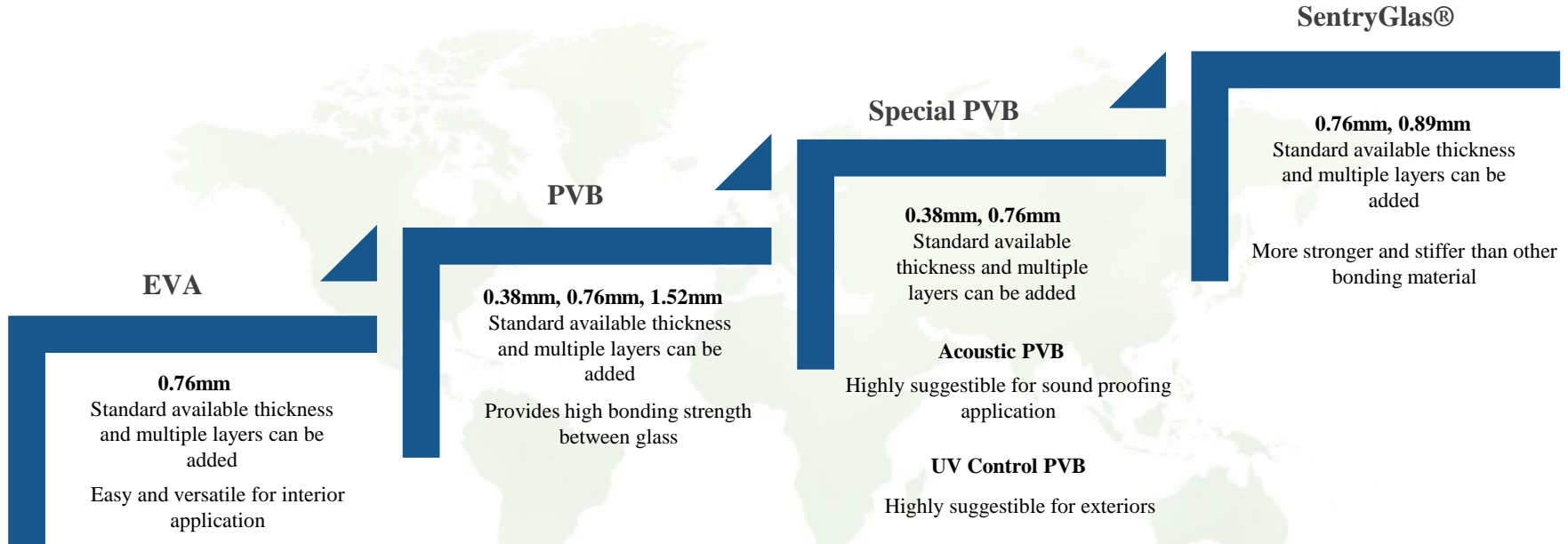
12,000 Sq. Meters + of glass per month

Upgraded technology with dust-free clean room (100,000 class) and auto-rewinding and motorised PVB pulling structure to protect the PVB's quality while laying on glass

PRODUCT PORTFOLIO

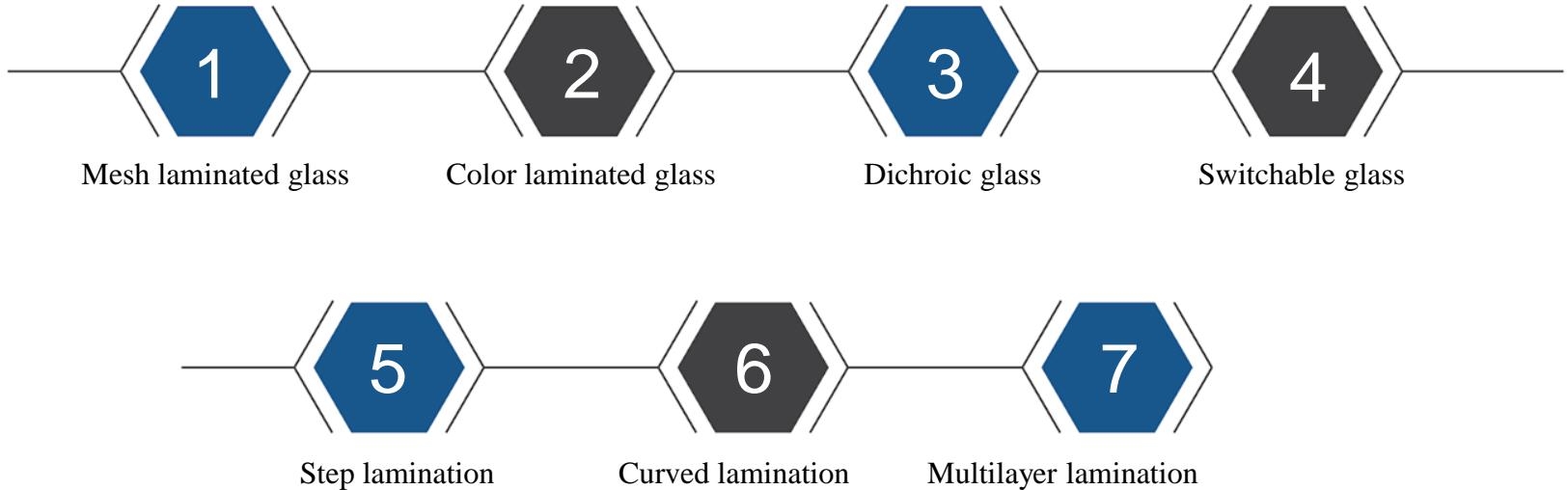
BONDING MATERIAL – INTERLAYER - PRODUCTS

TYPES OF BONDING MATERIAL



Laminated glass is basically a glass sandwich. It is made of two or more plies of glass with a vinyl interlayer(EVA /PVB /SGP) between.

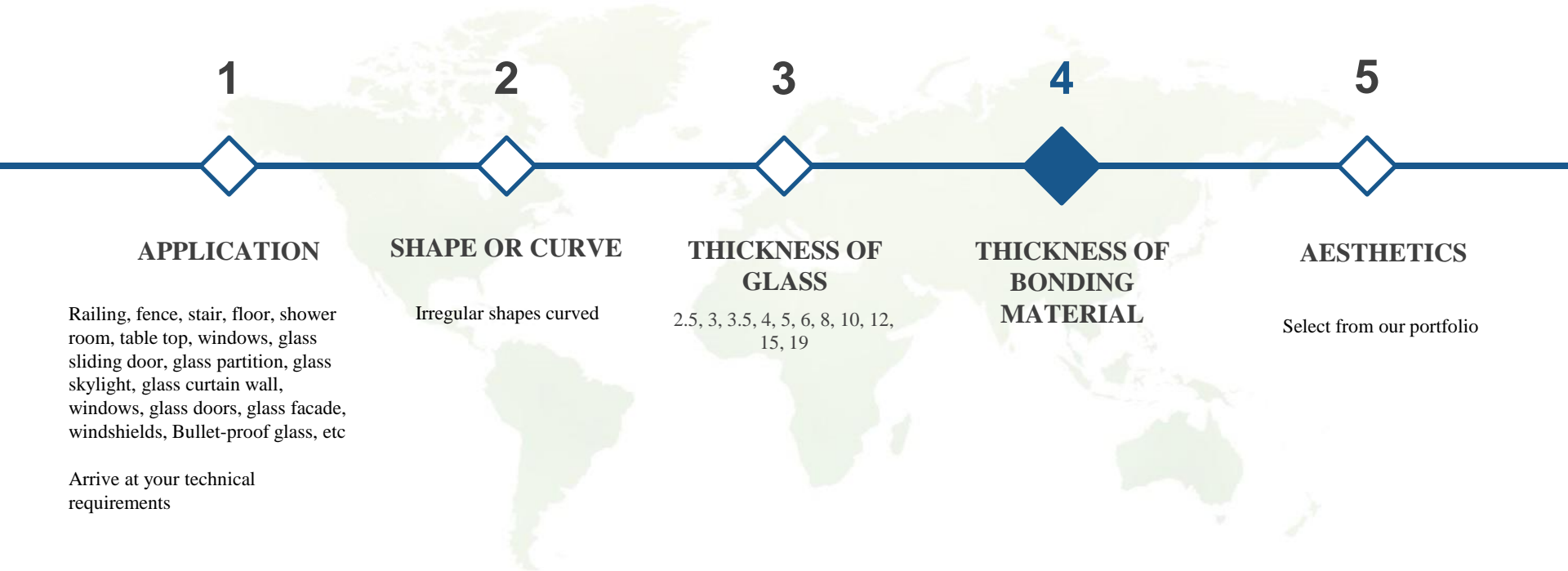
PRODUCT PORTFOLIO



Add aesthetics with functional benefits

Unique and versatile collections of interlayers which insulates

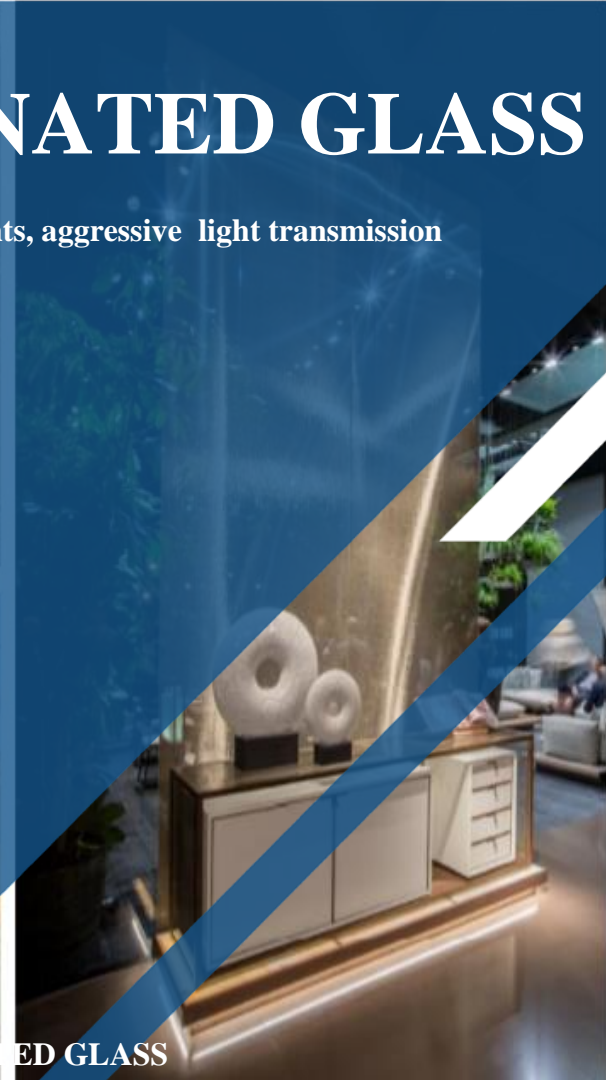
PRODUCT SELECTION JOURNEY



MESH LAMINATED GLASS

Prevents 0.7 – 1.5 % of UV rays, IR lights, aggressive light transmission

Maximum size : 2.4m X 4.5m



CURTAIN EFFECT WITHIN LAMINATED GLASS

COLOR LAMINATED GLASS

Prevents UV rays, IR lights, light transmission

Maximum size : 2.4m X 4.5m

AVAILABLE IN DIFFERENT SHADES ON DEMAND :

BASIC SHADES: Blue, Green, Yellow, Orange , Red,

DICHROIC GLASS

Prevents UV rays, IR lights, aggressive light transmission

Maximum size : 1.52m X 4.2m

ATTRACTIVE SHADES OF DYNAMIC COLORS

SWITCHABLE GLASS

Prevents UV rays, IR lights, light transmission

Maximum size : 1.7m X 3.6m

RANGE OF PRODUCTS :

1. White LCG
2. Blind
3. IR Film
4. High temperature film

Flexibility on demand

TECHNICAL DATA SHEET

COMPARISON – CONSIDERATION

ACOUSTIC PROPERTY

P
A
R
A
M
E
T
E
R
S

| SPECIFICATIONS | DECIBELS |
|----------------|-----------|
| 4 + 0.38 + 4 | 37(-1,-3) |
| 5 + 0.38 + 5 | 38(0.2) |
| 6 + 0.38 + 6 | 39(0,-2) |
| 8 + 0.38 + 8 | 41(-1,-3) |
| 10 + 0.38 + 10 | 42(0,-2) |

ACOUSTIC PROPERTY

P
A
R
A
M
E
T
E
R
S

Stiffness

Thickness

Damping



Frequency



Wavelength
h

Insulated glass for Acoustics ?

Thickness

Air Gap

GLASS DEFLECTION ACCORDING TO ASTM E1300-09A

X2. ALTERNATE PROCEDURE FOR CALCULATING THE APPROXIMATE CENTER OF GLASS DEFLECTION

GLASS PARAMETERS

| | |
|-----------------------------------|-----------|
| Thickness, t | 7.91 mm |
| Long dimension, a | 1000 mm |
| Short dimension, b | 1000 mm |
| Modulus of elasticity of glass, E | 71700 GPa |
| Uniform lateral load, q | 10 KPa |

DESIGN PARAMETERS

| | | |
|--|-------|-----------------------|
| $r_0 = 0.553 - 3.83 (a/b) + 1.11 (a/b)^2 - 0.0969 (a/b)^3$ | | ASTM E1300-09A (X2.2) |
| $r_0 = 0.553 - 3.83 (1000/1000) + 1.11 (1000/1000)^2 - 0.0969 (1000/1000)^3 =$ | -2.26 | ASTM E1300-09A (X2.2) |
| $r_1 = -2.29 + 5.83 (a/b) - 2.17 (a/b)^2 + 0.2067 (a/b)^3$ | | ASTM E1300-09A (X2.3) |
| $r_1 = -2.29 - 5.83 (1000/1000) + 2.17 (1000/1000)^2 + 0.2067 (1000/1000)^3 =$ | 1.58 | ASTM E1300-09A (X2.3) |
| $r_2 = 1.485 - 1.908 (a/b) + 0.815 (a/b)^2 - 0.0822 (a/b)^3$ | | ASTM E1300-09A (X2.4) |
| $r_2 = 1.485 - 1.908 (1000/1000) + 0.815 (1000/1000)^2 - 0.0822 (1000/1000)^3 =$ | 0.310 | ASTM E1300-09A (X2.4) |
| $x = \ln\{\ln[q(ab)^2 / Et^4]\}$ | | ASTM E1300-09A (X2.5) |
| $x = \ln\{\ln [10 (1000/1000)^2 / 71700 \times 10^3 \times 7.91^4]\} =$ | 1.27 | ASTM E1300-09A (X2.5) |

CENTER OF GLASS DEFLECTION, w

| | | |
|---|-----------------|-----------------------|
| $w = t \times \exp\{r_0 + r_1 \times x + r_2 \times x^2\}$ | | ASTM E1300-09A (X2.1) |
| $w = 7.91 \times \exp\{-2.26 + 1.58 \times 1.27 + 0.31 \times 1.27^2\} =$ | 10.12 mm | ASTM E1300-09A (X2.1) |

| HEIGHT | | | | | | | |
|-----------|------|-------|-------|-------|-------|------|-------|
| WIDT H | Size | 2000 | 25000 | 3000 | 3500 | 4000 | 4500 |
| | 1000 | | | 0.23 | 0.4 | 0.49 | 0.49 |
| | 1500 | 0.086 | 0.266 | 0.5 | 0.761 | 0.97 | 1.121 |
| | 2000 | 1.03 | 1.47 | 2.028 | 2.59 | 3.11 | 3.54 |
| | 2400 | 2.29 | 2.97 | 3.84 | 4.77 | 5.66 | 6.46 |

TECHNICAL COMPARISON

PVB vs SGP

PVB

PVB is Polyvinyl butyral, many different suppliers can produce this material all around the world.

“PVB” it will fall down or break when both sides have become damaged.

Application for PVB laminated glass: railing, fence, stair, floor, shower room, table top, windows, glass sliding door, glass partition, glass skylight, glass curtain wall, windows, glass doors, glass facade, windshields, Bullet-proof glass, etc

Clarity: The PVB yellow index is 6-12

PVB is hygroscopic in nature. And it should not be exposed to direct moisture

SGP

SGP is abbreviation of SentryGuard Plus Interlayer, created by American brand Dupont, on June 1, 2014, Kuraray Co., Ltd. became the exclusive licensee for the technology and trademark of SentryGlas®.

“SGP” will stay standing when both sides are broken

The SGP laminated glass is five times stronger and up to 100 times stiffer than PVB laminated glass.

Designers like to use SGP laminated glass for application which face to bad weather like typhoons, hurricanes and cyclones, also for some place with war or need high security.

Clarity: The SGP yellow index is smaller than 1.5

TECHNICAL COMPARISON



Annealed Glass

Breaks easily, typically in long sharp shards.



Heat-strengthened glass

Resistant to breakage, 2X as strong as annealed glass, breaks in large shards.



Fully Tempered Glass

Resistant to breakage, 4X as strong as annealed glass, shatters completely in small pieces, typically vacates the frame after impact.



Laminated Glass

Resistant to penetration, breaks upon impact, tends to keep shards intact upon and after breakage. Two or more pieces of glass adhered together by interlayer.

TECHNICAL COMPARISON

PVB vs SGP

PVB



SGP



TECHNICAL COMPARISON

P
A
R
A
M
E
T
E
R
S

| Performance | SGP | PVB |
|---|--------------------------------------|--------------------|
| Density (g/cm ³) | 0.95 | 1.07~1.08 |
| Coefficient of linear expansion (°C ⁻¹) | 10~15x10 ⁻⁵ (-20°C ~32°C) | 4x10 ⁻⁴ |
| Tensile strength (Mpa) | 34.5 | 20 |
| Tear strength (Tear energy) (MJ/m ³) | 50 | 10-15 |
| CSS (Mpa) | >20.7 | |
| Elongation (%) | 400 | 275 (ASTM D-412) |
| HDT @ 66 PSI | 43°C | |
| Haze | <2% | <2% |
| YID % | <2.5 | 10-15 |
| Refractive index | 1.5 | 1.47~1.5 |
| UV cutoff wavelength (nm) | 310 | 380 |
| UV screening (%) 3C+0.38+3C | 99.98 | 99.98 |

TECHNICAL CONSIDERATION

TOUGHENED VS HEAT STRENGTHENED

TOUGHENED LAMINATION

Delamination in future

Weak adhesion between glass due to roller waves

HS LAMINATION

The bonding of two glasses will be at the best.

Incase of breakage at any side, the replacement can be done at any duration and the view will not be much disturbed.

The roller marks on the surface of the glass is very minimal, superior in adhesion and distortion is also very minimal.

Incase of breakage the glass will not sag or drop down, it will remain as rigid – It doesn't require immediate replacement.

HS glass can withstand a maximum wind load (ref : NBC)

Incase of burglary – The breaking pattern of glass will vary from one side to another, wherein it is difficult to penetrate inside.

Delamination issues are very minimal.

QUALITY ASSURANCE

As per Indian and international standards

RESISTANCE TOWARDS IMPACT

As per Indian and European standards

RESISTANCE TOWARDS PENETRATION

As per Indian and European standards

RESISTANCE TOWARDS UV

As per Indian and European standards

RESISTANCE TOWARDS DISTORTION

As per Indian and European standards

RESISTANCE TOWARDS LOAD

As per Indian and European standards

RESISTANCE TOWARDS TEMPERATURE

As per Indian and European standards

Dedicated laboratory with state of art technology as per Indian, European, Australian, standards

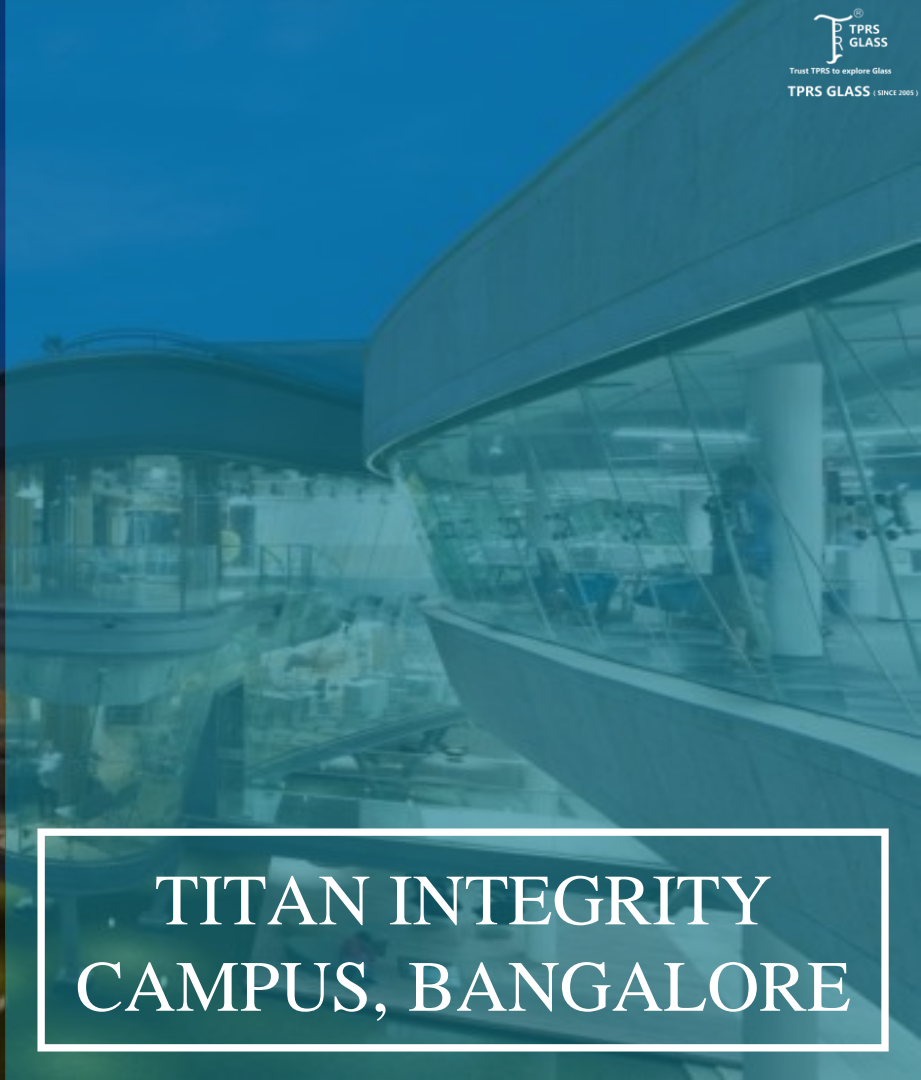
PROJECT PORTFOLIO

TITAN INTEGRITY CAMPUS, BANGALORE

Bend Laminated and SGU Panel for spider glazing curved facade



Bend Laminated and SGU Panel for spider glazing curved facade



TITAN INTEGRITY CAMPUS, BANGALORE

PROJECT VOLUME : 5000 SQM

PRESTIGE TRADE TOWER, BANGALORE

KS 138 IGU PANELS


PRESTIGE TRADE TOWER

PRESTIGE TRADE TOWER, BANGALORE

Bend Laminated and SGU Panel for skylight

MODI MASJID, BANGALORE

Digitally printed and bent laminated glass

KESSAKU, BANGALORE

Curved laminated glass

KESSAKU



VR MALL, CHENNAI

Ceramic printed laminated glass

Responsive to customer needs



Inhouse product and design development team



Always audit ready for vendor assessment



100 % quality

We bring 25 years of safety glass expertise

Clear and transparent account statement



Easy access to all levels of people in management



Superior Finish
High accuracy



Just In Time delivery
Short lead time



Realtime support for post sales enquiry



Quick adaptability to any changes



Round the clock operations

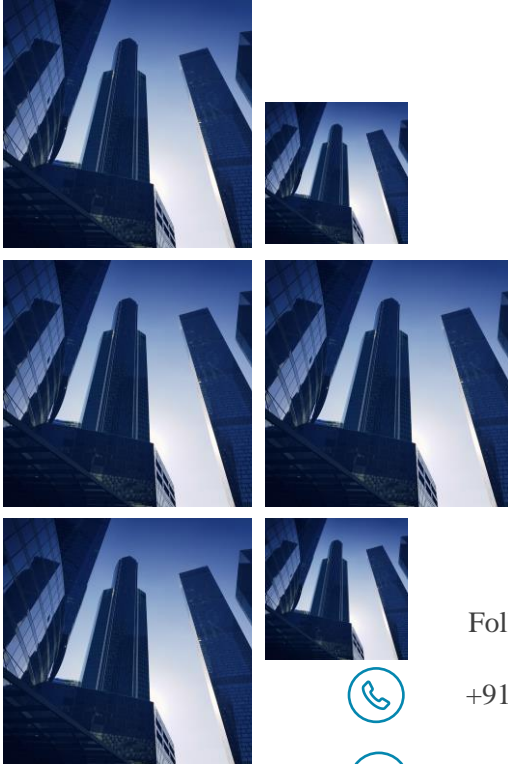


Packaging to suit your needs



TRUST TPRS

to explore glass



Currently Serving :

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- Karnataka
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- Goa
- Telangana
- Andhra Pradesh etc.

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We will be happy to assist you with the most trusted glass and fabrication suggestions



TPRS

Values – QSPI

- Quality
- Serviceability
- Professionalism
- Innovation

