



 **Mad**TM
About Glass

Your advanced
Glass Maker in
Saudi Arabia



**A.N. Alodan & Sons Co. Glass
& Aluminium Factory
(Komate Glass)**

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Plant:
Sudair Industrial & Business City

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Centrally located
- **Sudair Industrial City**
near Riyadh

Komate
Committed to Quality. Committed to You

Mission

To be the name of repute and trust in the regional market of glass solutions and allied products and emerge as the most reliable player and solutions facilitator for our customers by continuous improvement in terms of man, machine, technology, product quality and services.

Vision

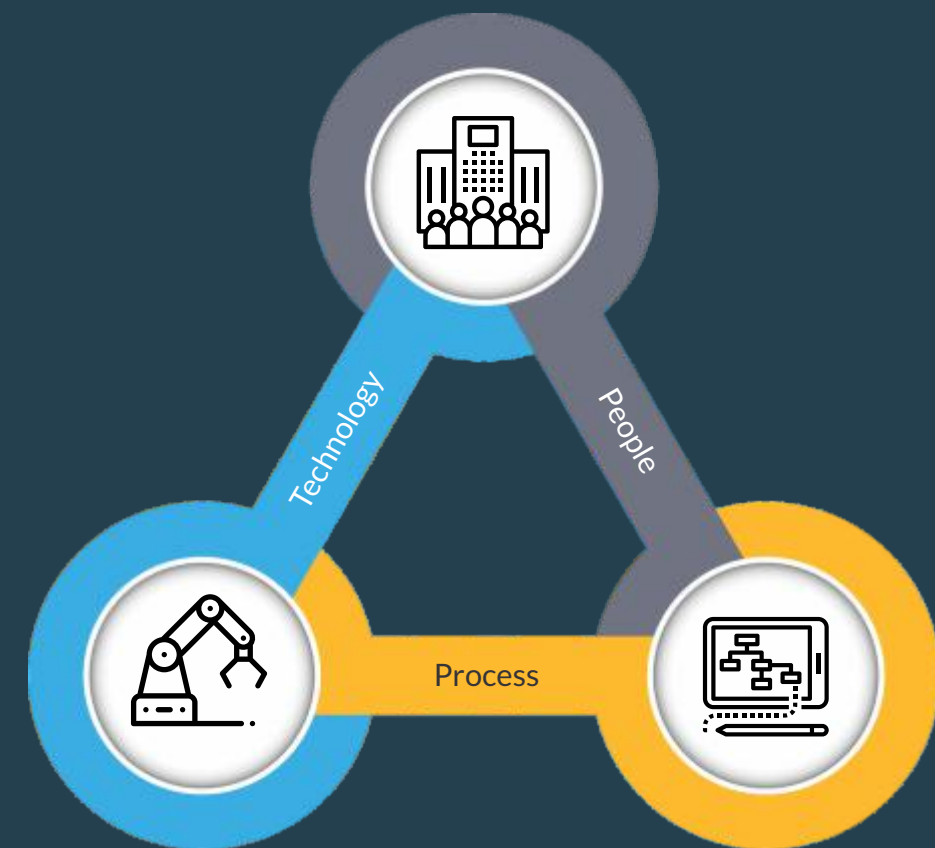
KOMATE'S vision is to "Strive for excellence". This byline captures KOMATE'S culture.

KOMATE'S products and services aim to delight our customers by helping them to obtain excellent products in terms of comfort, safety and security.

KOMATE'S corporate culture of merit and transparency brings best achievement of people who desire to excel in technology, knowledge, systems, customer relations and many more. **To transcend the ordinary.**

Our manufacturing facility continues to improve using
Six-Sigma Practices

Our Principles



The 3 pillars of People, Process and Technology are the foundation pillars of our existence

KOMATE has instituted a triad culture that has been the key focus from the start and is critical for reliable services delivery: People, Process & Technology.

People processes of selection, training, empowering and retention leads to business ownership and a disciplined approach towards assigned functions. The Process leg of the triad provides the roadmap and direction for our people to utilize our technology to address customer

requirements leading to satisfaction. Rather than merely being compliant with international standards, KOMATE is proud of the fact that the Quality Management System (QMS) has been audited externally and has processes in place for continuous improvement with the goal of providing consistent customer satisfaction for all types of glass that we make.

About Komate

A.N. Alodan & Sons Co. Glass & Aluminium Factory

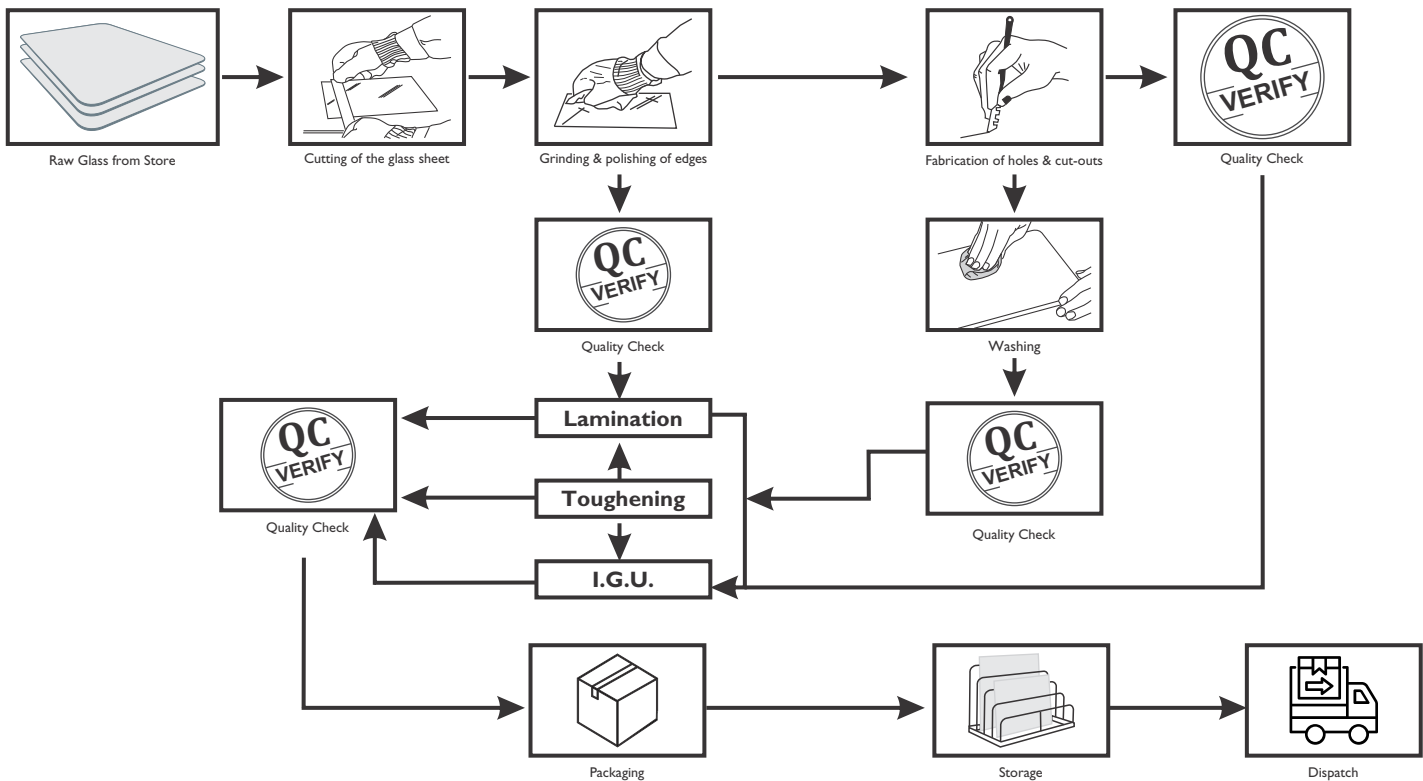


- Fastest emerging glass processing enterprise with extensive experience in the production, processing and trade of glass

→ Fully automated production line controlled by a highly sophisticated and customized ERP Systems from production control to web based real time ordering
- Having one of the best equipment's and machinery for highest performance.

→ One-stop-shop for all Glass requirements with high emphasis on world class quality, backed by research and testified by leading clients for products and service.

Process Flow



Production Line

Glass Sheet Inspection & Unloading	Auto Loader	CNC Cutting Machine	Preprocessing Line	CNC Work Station (Forvet)	Washing Machine (Triulzi)	Heat Soak Kiln from Blokkiln	Tempering Line (FC Series)	Insulated Glass Line	Laminated Glass Line	Autoclave
Capable to unload 6 tones or loss sheets using our cranes	A fully computerized PLC/Analog Machine with touch screen operations from Lisec. Two Arms Max. Glass size it can lift 3000x6000 mm No. of lifting Location 4 x 2	From Lisec, Austria with edge deletion facility & scanning ability. No. of sheets 200 /8 hrs shift Max. Glass size it can lift 3000x6000 mm Thickness 3 to 19 mm	An automatic pre-processing line integrated with cutting having both double edgers and seamers. Size: 2500x5000 mm Thickness: 4 to 19 mm Volume: 6000 lm / 8 hrs	An automatic CNC Work Station from Forvet, Italy to have best quality edge processing. Size: 2500x4880 mm Thickness: 4 to 19 mm Volume: 5000 lm / 8 hrs	A machine from Triulzi, Italy with capability to do low-e and triple silver glasses. Size: 2500x4880 mm Thickness: 4 to 19 mm Volume: 8000 lm / 8 hrs	Size 5 meter x 3 meter	From Glaston, Finland equipped with top & bottom convection with ability to process low emissivity and triple silver glasses Size: Flat Glass: 2440x4880 mm Thickness: 4 to 19 mm of glass. Volume: The Installed capacity of line is 1600 sq m in 10 hrs	From Lisec, Austria with integrated robotic sealing and online gas filling with ability to do stepped units. Size: 2440x4880 mm Thickness: Up to 40 mm Volume: 800 sq m in 8 hrs	From Handong, China, the line is fully automatic line with automatic cutting of PVB and heater section equipped with forced convection technology, thus having ability to process soft coated low-e glasses. Size: 2440x4880 mm Thickness: Up to 80 mm Volume: 600 sq m in 8 hrs	From Akarmak, Turkey, one of the leading autoclave manufacturers equipped with vacuum bags. Size: 3000x6000 mm Volume: 800 sq m in 8 hrs

The Best Technology of Today

Ready for Tomorrow



Lamination

“ Factory Area
- 20,000 sq.
meters ”



Automated Insulated Glass Line



Heat Soaking



Automatic Cutting Line

“ Capital
Investment
of over
40 million
Saudi Riyal ”



Fully controlled by Enterprise
Resource planning from
LISEC



State-of-Art Tempering Line



Automated Pre-Processing Line

Technology Partners

LISEC

AUSTRIA

FORVET

ITALY

glaston

FINLAND

GL

CHINA

TRIULZI

ITALY

akarmak

TURKEY

BLOKKILN

NETHERLAND

IMMES

ITALY

Atlas Copco

BELGIUM

“ Ability to
produce glass
covering 1 football
field in 3 days ”



Sandblasting - Dynamiki

70
experienced
and qualified
professionals

“ 24x7
customer service
mind-set ”



Trulzi Washing



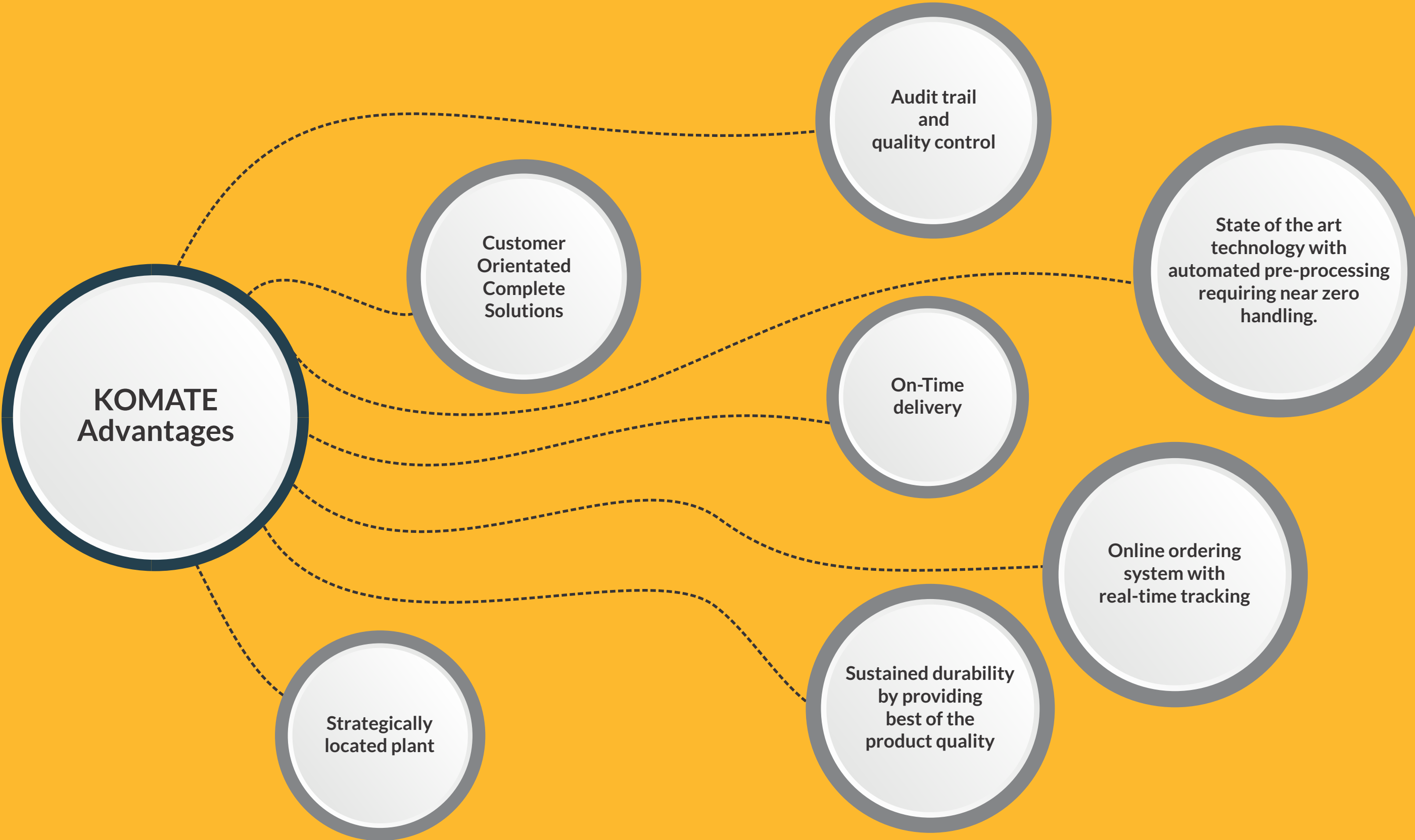
CNC Workstation



Automated Loading Station

Our Key Differentiations

KOMATE Advantages



KOMATE Glass Product Range

Tempered Glass



- Clear Tempered glass
- Ultra-Clear Tempered glass
- Hard Coated reflective tempered glass
- Soft Coated Low-e reflective tempered glass including double silver and SN-X series
- Tinted tempered glass

Heat Strengthened Glass



- Clear Heat Strengthened glass
- Hard Coated & Soft coated reflective heat strengthened
- Tinted heat strengthened glass

Heat Soaked Glass



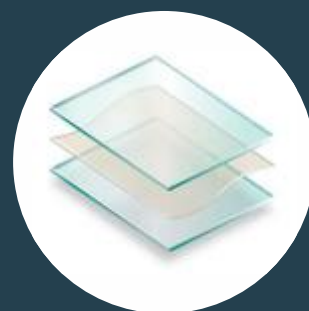
- Tempered Heat Soaked Glass

Insulated Glass



- Double glazed Units
- Triple glazed units
- Insulated glass Units with low-e high performance glasses.
- Insulated glass units with up to 4-side stepped
- Insulated glass Units with Argon Gas
- Insulated glass Units with U Insert and Schuco Spacers

Laminated Glass



- Annealed Clear Laminated Glass
- Triple Laminated Annealed Glass
- Tempered Clear Laminated Glass
- Bulletproof Laminated Glass

Premium Glass



- Decorative / Coloured Laminated Glasses

Printed Glass



- Roller Coated / Digital Printed Tempered / Insulated / Laminated Glasses

Ready to conform to every demanding application

- 1 Wall partition
- 2 Wall Cladding
- 3 Facade
- 4 Window
- 5 Balustrade
- 6 Spandrel
- 7 Door



Tempered Glass



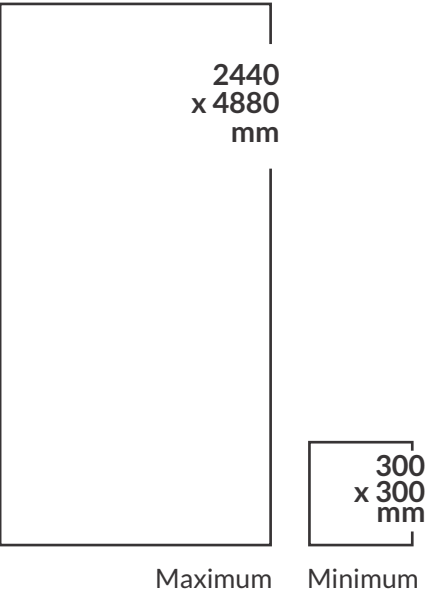
Thickness

✂ 4 mm to 19 mm

Product Range

- Clear Tempered glass
- Ultra-Clear Tempered glass
- Hard Coated reflective tempered glass
- Soft Coated Low-e reflective tempered glass including double silver and SN-X series
- Tinted tempered glass

Available Sizes



Technical Specifications

Properties	Annealed Glass	Tempered Glass series
Bending Strength / Tensile Strength	20 – 40 N/mm2	120 – 200 N/mm2
Compressive Strength	20 – 50 N/mm2	80 – 120 N/mm2
Thermal Stress resistance	Low	5 to 6 times that of annealed glass
Thermal Endurance	Temperature differential of 28 to 38 degree Celsius	Temperature differential of 180 to 220 degree Celsius
Mechanical or Impact Resistance	230 gm steel ball breaks a 6mm annealed glass when dropped from 50 cm height. 500 gm steel ball dropped from 30 cm will break 8mm annealed glass	230 gm steel ball cannot break 6 mm clear tempered glass when dropped from 350 cm height 500 gm steel ball dropped from 2 meters will not break 8 mm clear tempered glass.
Breakage Pattern	Large harmful pieces, no fixed pattern	Small harmless pieces with dulled edges. 2 square inch of 5 mm clear tempered glass will break into more than 45 harmless pieces

Product Range

Clear Tempered Glass:
It provides safe breakage characteristics. Ideally suited for critical locations where safety is important such as doors, side panels and glazing at low levels.

Extra Clear Tempered Glass:
Low Iron Oxide Extra Clear Tempered Glass provides extra vision, higher light transmission and zero color distortion.

Tinted Tempered Glass:
It improves aesthetics and saves power.

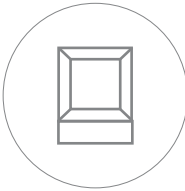
Reflective tempered Glass:
It is a high performance hard coat / soft coat reflective tempered glass that reduces heat gain inside buildings, reduces glare, and provides better working environment.

Low-e Tempered Glass:
High Performance Low Emissivity reflective tempered glass performs better than reflective tempered glass in terms of light transmittance and heat gain.

Frosted tempered Glass:
A Clear Tinted rough body, figured float or other translucent tempered glass that can be used at places where translucent light, safety and privacy is of utmost importance.



Furniture



Commercial Use

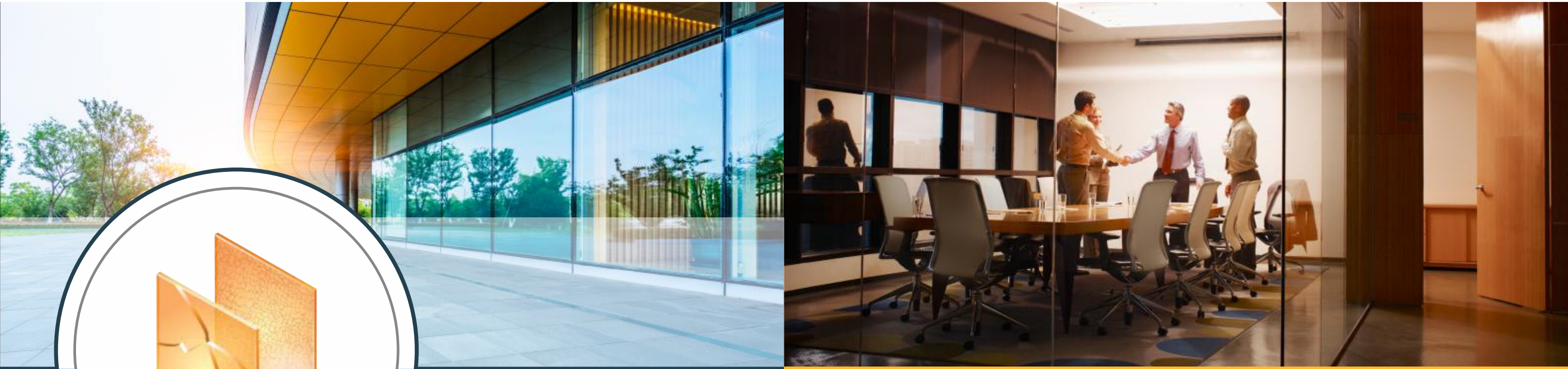


Construction



Home Appliances

Heat Strengthened Glass



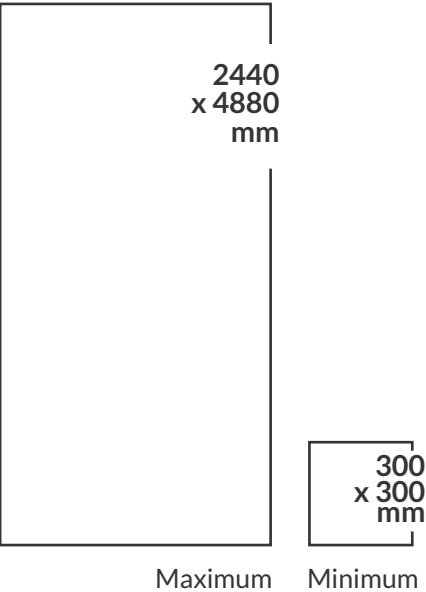
Thickness

✂ 4 mm to 19 mm

Product Range

- ➔ Clear Heat Strengthened glass
- ➔ Hard Coated & Soft coated reflective heat strengthened
- ➔ Tinted heat strengthened glass

Available Sizes



Technical Specifications

Properties	Annealed Glass	Heat Strengthened Glass
Bending Strength /Tensile Strength	20 – 40 N/mm2	50 – 70 N/mm2
Thermal Stress resistance	Low	2 to 3 times that of annealed glass
Thermal Endurance	Temperature differential of 28 to 38 degree Celsius	Temperature differential of 100 to 150 degree Celsius
Mechanical or Impact Resistance	230 gm steel ball breaks a 6 mm annealed glass when dropped from 50 cm height.	230 gm steel ball cannot break 6 mm clear hear strengthened glass when dropped from 150 cm height
Breakage Pattern	Large harmful pieces with sharp edges	Large pieces with dulled edges

Applications

It can be used for general glazing where additional strength or resistance is required for mechanical / thermal loads caused by certain tinted or coated glass. The glass can also be used in high wind load areas, but cannot be used in any safety glazing

applications, due to its breakage pattern similar to annealed glass. Heat-strengthened glass is widely used in laminated glass for additional strength, such as in overhead and sloped glazing.

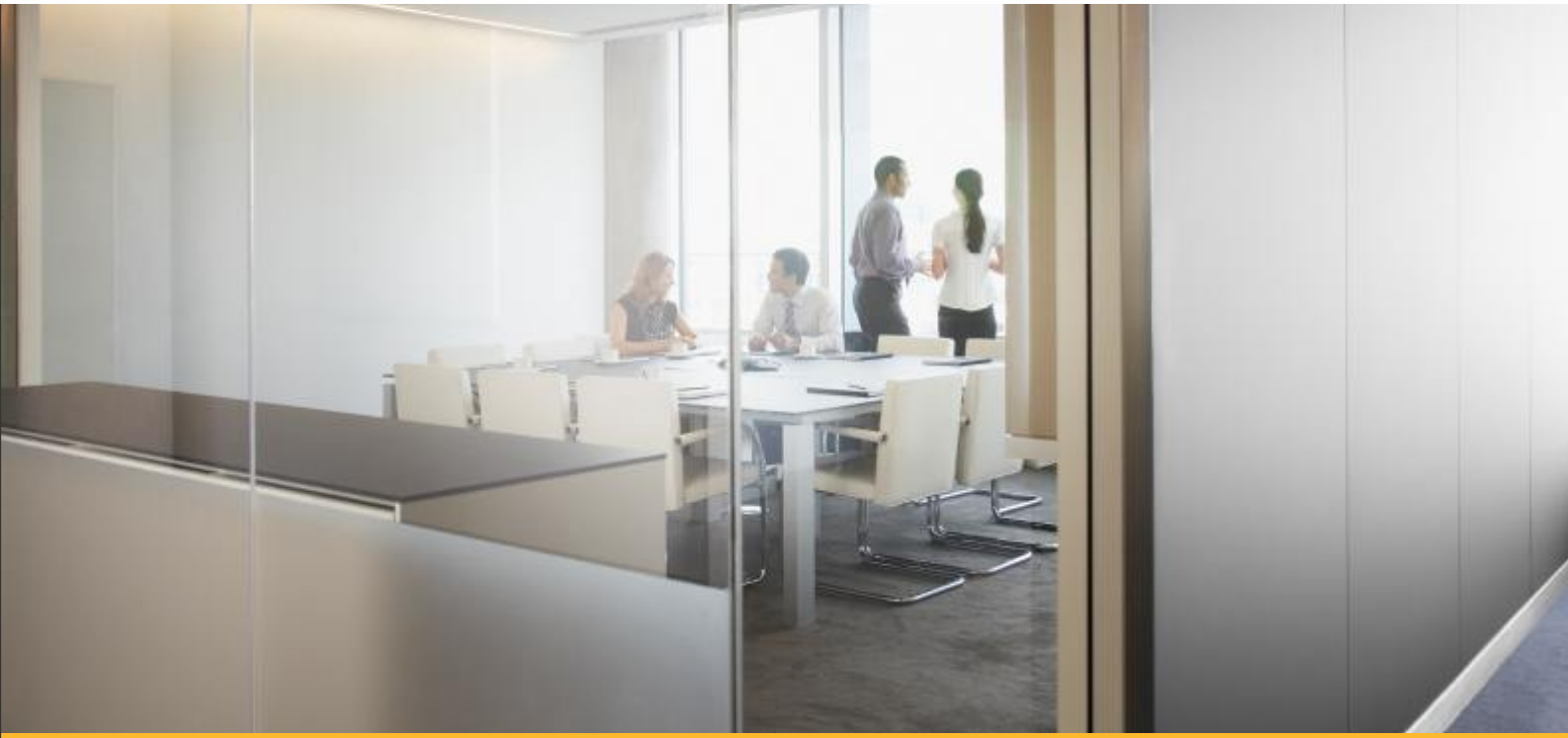


Higher thermal endurance Areas



Higher temperature variation Areas

Heat Soaked Glass



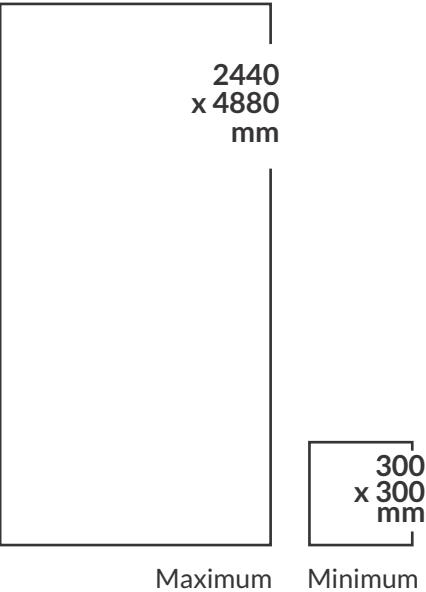
Thickness

✂ 4 mm to 19 mm

Product Range

→ Tempered Heat Soaked Glasses

Available Sizes



Product Range

Up to 95% NiS infected panes are usually destroyed at factory itself.
Due to inherent safety and security benefits, it is highly recommended for tempered glass to be heat soaked in applications where consequences of breakages are high.

Minimizing NiS Fractures:
Making sure that fractures happen within the factory rather than at site after installation.

Applications

The use of heat-soaked tempered glass is recommended where the risk of spontaneous breakage would cause difficulty, either from a replacement point of view, or where falling glass fragments may be unsuitable, such as roof or high level glazing, balustrades, screens and high level curtain walling.

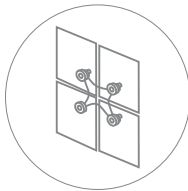
Heat soak glass is appropriate where there is a risk of human impact. If breakage does occur, the breakage pattern is such that the resultant pieces of glass are relatively harmless and are unlikely to cause severe injury.



School Façade



Hospital Façade



Spider Fittings

Insulated Glass



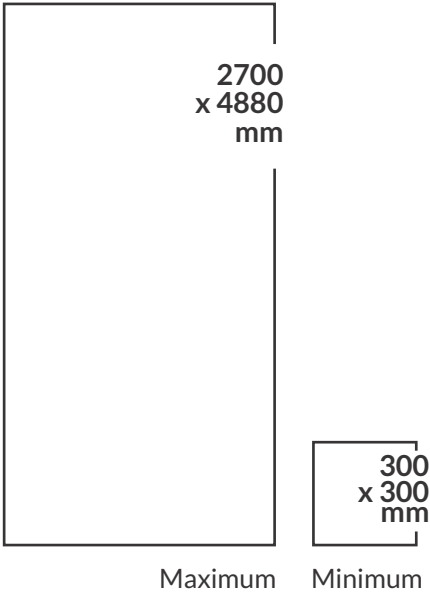
Thickness

✂ up to 60 mm

Product Range

- ➔ Double glazed Units
- ➔ Triple glazed units
- ➔ Insulated glass Units with low-e high performance glasses.
- ➔ Insulated glass units with up to 4-side stepped
- ➔ Insulated glass Units with Argon Gas
- ➔ Insulated glass Units with U Insert and Schuco Spacers

Available Sizes



Product Range

Clear Insulated Glass:

Mainly used in Facades, windows, partitions and display glazing, Komate Clear insulated glass is perfectly suited to places where banning solar heat, acoustic insulation and high visibility is the requirement.

Tinted / Reflective Insulated Glass:

It provides higher insulation from heat produced due to direct and indirect solar incident energy and due to conduction / convection and long wave infrared radiation.

Super safe and silent Insulated Glass:

The special properties of this glass are its very high acoustic and heat insulation capabilities that confirm to BS 5713, EN 1179, IS 11907, 11050, 9901 and 3792. It lowers U Value by 50% and gives total insulation from UV, Noise and burglary. It is used extensively in high noise pollution and high safety areas like airports, hospitals, railways etc.

This glass is also highly preferred in meeting rooms, board rooms, restaurants, pharmaceutical labs, covering of boiler / blower rooms, Yoga and meditation centers etc.

Low-e high Performance Insulated glass units

Low-emissivity glass (or low-e glass as it is commonly referred to) is a type of **energy-efficient glass** designed to prevent heat escaping out through your windows to the cold outdoors. By installing low-e windows, you can significantly improve your Window Energy Ratings and reduce the amount of energy lost through your windows by 75%! .

Applications

Insulating glass (IG) units are used in a wide range of applications including: Commercial, Residential Fixed, Operable windows, Curtain, Walls, Storefronts, Sloped, Overhead Glazing, Non-vision (Spandrel) locations.



Refrigeration Industry



Windows & Partitions



Facades

Laminated Glass



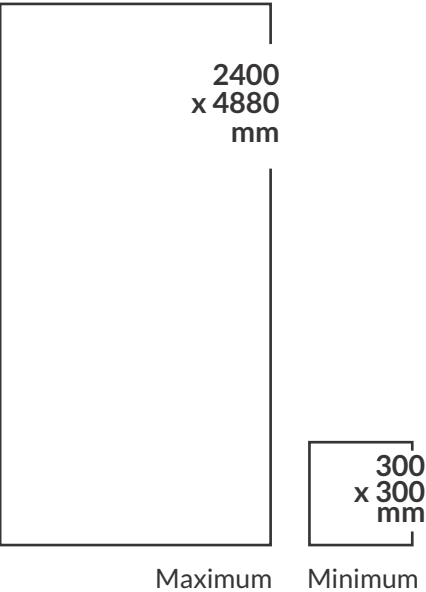
Thickness

✂ 25 mm to 80 mm

Product Range

- ➔ Annealed Clear Laminated Glasses
- ➔ Triple Laminated Annealed Glasses
- ➔ Tempered Clear Laminated Glasses
- ➔ Bulletproof Laminated Glasses

Available Sizes



Technical Specifications

Type of Glass	Nominal Thickness	Weight (Kg /m2)	Weight Type of firearm(Kg /bullet)	Ammunition type	Test range	Bullet Velocity (m/s)	No. of strikes
19 mm Clear Tempered	19	47	Handgun / SoftCore	0.22 Caliber	10 m	400 ±10	Fail
Toughened Laminated	19	44	Handgun / SoftCore	0.22 Caliber	10 m	400 ±10	Fail
Toughened triple laminate	19	44	Handgun / SoftCore	0.22 Caliber	10 m	400 ±10	3
Toughened triple laminate	23	53	Handgun / SoftCore	0.357 magnum	10 m	430 ±10	3
Toughened triple laminate	13	31	Rifle / Roun dnose	0.22 LR	10 m	360 ±10	3

Product Range

Annealed Clear laminate glass:

Komate laminated glass provides better sound insulation and heat insulation than a monolithic glass of same thickness. It additionally provides elementary safety against risk of injury, due to falling of fragments in the event of breakage.

This acoustic insulating glass during breakage forms a spider web, sticks to self and remains fixed to the structure until replacement.

Annealed Triple laminated glass:

This is a higher grade of interior safety and acoustic glass that typically uses three layers of annealed clear/tinted glass or mirror. It is primarily used at places where the properties desired in terms of sound insulation and safety is of higher concern and at the same time economics of scale is also desired. It can be used in glazing for show case, jewelry shop counters, receptions, bank teller and cash counters, etc.

Its Uses:

- ➔ Overhead Glazing like roofing and canopy etc.
- ➔ Board rooms, meeting rooms and class rooms where silence is required.
- ➔ Glazing art home and offices
- ➔ Glazing at higher levels.

KOMATE tempered laminated glass:

With higher mechanical strength, thermal strength and resistance against breaking in, this glass has higher strength than above two products with double / triple layers of glasses and in various combination of Clear / Tinted / Reflective glasses. It is suitable for side panels, fish aquariums, steps of stair case, shopping malls, atriums, airports and hotels. It provides higher grade of protection and safety from the risk of breakage, injury and burglary, etc.

It has much higher heat insulation properties and will depend on the type of product selected for heat insulation.

KOMATE Bullet Proof glass:

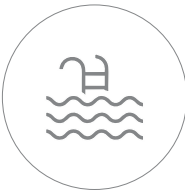
This glass gives security against bullet and shot gun attacks and complies with safety and glazing standards EN 1063 and BS 5051. It is capable of giving protection from hand guns of range 9mm parabellum, 357 / 44 magnum, rifles and 1.2 bore shot gun, explosions and bombs and thus, used in high safety areas like defense Installations, VIP rooms and buildings, very tall buildings, top-most hospitals, banks, financial institutions, etc.



Shower Screens



Sliding Doors



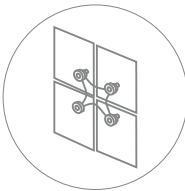
Swimming Pools



Offices & Banks



Balustrade



Spider system

Premium Glass



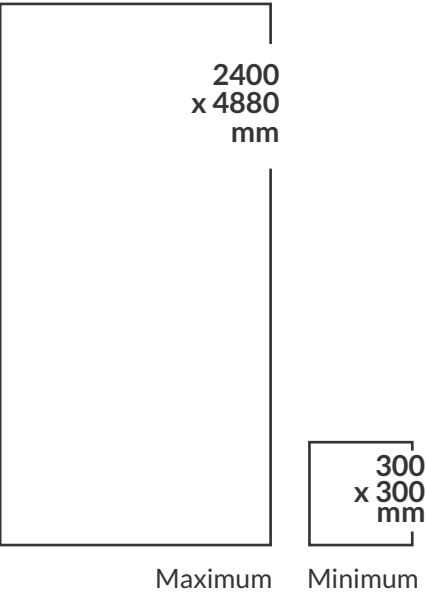
Thickness

✂ 6 mm to 80 mm

Product Range

➔ Decorative /
Coloured laminated Glasses

Available Sizes



Product Range

KOMATE decorative laminated glass:

It is a decorative PVB laminated glass available in wide variety of colors, design and thickness confirming to BS 6206, BS 6262, EN 12150, IS 6640, BS 857, ANSIZ - 97 Standards.

Komate decorative laminated glass provides aesthetics with safety. It is primarily used in interiors as a decorative glass but at places where human contact is very regular. It does not fall, remains stuck to self and fixed to the structure until replacement in the event of breakage. It forms a spider web when broken which is difficult to penetrate due to strength of PVB.

Applications

This glass can be specified for both exterior and interior applications. When used on building exteriors, the painted surface must be protected from direct contact with the environment and is normally found in an insulating glass unit.

It is suitable for use in critical locations where safety is important and aesthetics is the requirement such as overhead glazing, glazing at floor, side panels, receptions, shop counters, hotel décor, galleries and different interior usage. It is also perfectly suitable for use in furniture's, table tops, shelves, shower baths, windows at high levels and display glazing. It provides heat and glare control. Also, it provides better acoustic control due to dampening effect of PVB.

Major applications include semi-transparent and translucent silk-screened glass for interior applications, including glass doors, partitions, handrails, glass ceilings, bathrooms, elevator walls and shower enclosures.



Wall Cladding



Shop Fronts



Galleries



Hotel Décor

Printed Glass



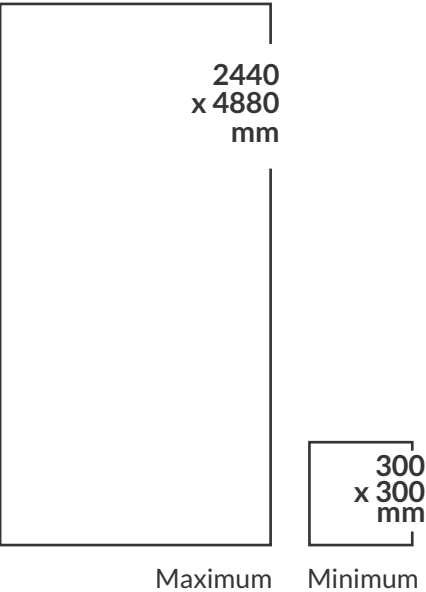
Thickness

✂ 4 mm to 19 mm

Product Range

➡ Roller Coated / Digital
Printed Tempered / Insulated
/ Laminated Glasses

Available Sizes



Product Range

Appearance:

Ceramic printed glass offers great variety of creative design options. In addition to the standard range, virtually any pattern or design can be screen-printed onto the glass.

Solar control:

Depending on the colour and density of the screen-printed pattern and the type of glass used, ceramic printed glass provides or enhances the solar control performance of the glazing.

Protection against glare:

Depending on the pattern and its distribution over the glass, ceramic printed glass acts as a filter against direct sunlight and helps reduce glare.

Aesthetic:

One major application is hiding the spandrel panels in a building (spandrel panels are the area between the floors, which has the concrete or the piping which is visible if glass is used). Spandrel panels are designed specifically for use in non-vision areas such as floor slabs, false ceilings, internal walls and columns. Ceramic printed glass acts as a cover to such an area, and also has an additional quality of improving the overall aesthetic of a building.

Applications

Splashbacks
Shower panels

Wall panels
Art installations

Corporate signage
Shop fit outs

Advertising Panels
Bus Shelters



Advertising Panels



Bus Shelters

Quality Policy

Transcend the Ordinary

Certifications & Approvals

To provide utmost satisfaction to the customers, shareholders, suppliers, employers and society.

Giving accurate and reliable results confirming to national / international standards.

Communicate the company’s quality statement & objective to all personnel and to involve every employee as active participant in the process of continual improvement.

Tests carried out during Processing

Tempered Glass

- 1. Dimensional test for length & width of cut size
- 2. Test for Visual Defects
- 3. GASP Surface Stress, Roller Wave & Edge Lift Measurements
- 4. Resistance to shock test
- 5. Impact Resistance Test
- 6. Fragmentation test
- 7. Glass Color Measurement by Spectrophotometer

Insulated Glass

- 1. Dimensional test for length & width of cut size
- 2. Test for Visual Defects
- 3. Condensation Test
- 4. Heat Gain Test
- 5. Shore A Hardness Test

To provide professional & honest services adhering to the highest level of business ethics.

Updating the skill of personnel through training.

Comply with requirements of certification bodies conducting periodical external audits to ensure quality and specification compliance.

Laminated Glass

- 1. Dimensional test for length & width of cut size
- 2. Test for Visual Defects
- 3. Light Stability Test
- 4. Boil Test
- 5. Fracture and Adhesion Test



Conformance to
ASTM and
EN Standards

Various Standards followed by company

British Standards:

- BS 6262 – Glazing for buildings, safety related to human impact.
- BS 6206 – Spec. for impact performance of flat safety glass for use in buildings.
- BS 857 – Spec. for safety glass for land transport.
- BS 5544 – Glazing resistant to manual attack.
- BS 5713-1979 – Hermetically sealed flat double-glazing unit

European Standards:

- EN 12150 – 1; Thermally Toughened soda-lime silicate glass.
- EN 1063 & 356; security glazing – resistant against manual attack.
- BS EN ISO 12543 Part 1&6 – Laminated safety glass specification.

American Standards:

- ASTM C 1036 – 06 – Standard Specifications for Flat Glass
- ASTM C 1048 – 04 - Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass
- ASTM C 1172 – 09 - Standard Specification for Laminated Architectural Flat Glass
- ASTM C 1464 – 06 – Standard Specification for Bent Glass
- ANSI Z97.1-2004 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test



Technical Specifications

- Sound Control

SOUND CONTROL		STL	STC	Rw	PSR
Glass Type	Configuration	Average STL (db)	STC Rating	Rw (db)	% Perceived Sound Reduction
4mm Float		25	28	28	10
5mm Float		26	29	29	15
6mm Float		27	31	31	25
8mm Float		29	33	33	35
10mm Float		30	34	34	40
6.38mm PVB Laminated	3mm/0.38mm/3mm	30	33	33	35
8.38mm PVB Laminated	4mm/0.38mm/4mm	33	35	35	45
10.38mm PVB Laminated	5mm/0.38mm/5mm	34	36	36	50
12.38mm PVB Laminated	6mm/0.38mm/6mm	36	38	38	55
9.52mm Acoustic Laminated	4mm/1.52mm Acoustic/4mm	34	38	38	52
11.52mm Acoustic Laminated	5mm/1.52mm Acoustic/5mm	36	39	39	55
13.52mm Acoustic Laminated	6mm/1.52mm Acoustic/6mm	37	40	40	58
20mm Komate IGU	4mm/12mmAS/4mm	28	30	30	20
22mm Komate IGU	5mm/12mmAS/5mm	29	31	31	25
24mm Komate IGU	6mm/12mmAS/6mm	30	31	31	25
22.4mm Komate IGU	6.38mm/12mmAS/4mm	34	38	38	55
24.4mm Komate IGU	6.38mm/12mmAS/6mm	34	38	38	55
25mm Komate IGU	7mmSoundstop/12AS/6mm	38	40	40	60

Enterprises Resource Planning & Maintenance Management



Enterprises Resource Planning

Komate had invested in state of art Enterprises Resource Planning system from Lisec, Austria to implement state of art systems and real time order status to its customers. Our ERP System consists of following modules:

Order Management

- Quotation Management
- Order Management
- Purchase management
- Warehouse & Inventory management
- Delivery and logistics management
- Invoicing

Production Management

- Production Planning
- Optimization
- Label management and printing solution
- Identification and traceability using online terminals
- Quality management and audit trails

ECom

- Web based Online ordering
- Quote and order status
- Real time order status
- Delivery and logistics update

Maintenance management

The goal of maintenance management is to control the allocation of resources, time and costs to ensure the efficiency and adequacy of the maintenance operations, avoiding waste of resources or even periods of downtime due to faulty equipment.

Komate has comprehensive scheduled preventive and predictive maintenance schedules to ensure smooth and uninterrupted operations. We have configured all our

machineries and spare parts assets in upkeep maintenance management software to organize maintenance schedule requests.

It helps us to manage

- Preventive maintenance
- Corrective maintenance
- Predictive maintenance