

INSULATED GLASS

LOW-E GLASS | 4SG GLASS

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QINGDAO LAUREL GLASS TECHNOLOGY CO., LTD was established in 2003.

Based in Qingdao City, the North of China, we have become one of the most professional and reputable integrations of industry and trade with a wide spectrum of glass businesses in architecture facades, interior decoration, furniture, shower glass, and optical applications.

By more than 20 years of development, Laurel Glass has boomed into a powerful company with 280 skilled workers, 30 multilingual sales staff, 1000+ long-term cooperative customers from all over the world, and a 100,000㎡ workshop with top processing equipment, various processing methods, high capacity, and strong R&D ability.

Our premium products comply with European Standards (CE), North American Standards (SGCC), and Australian Certificates (CSI).

With excellent quality and detail-oriented service, Laurel Glass will be your best partner for glass materials and solutions.







CERTIFICATION SOLUTIONS INTERNATIONAL

PRODUCT COMPLIANCE SCHEDULE

Qingdao Laurel Glass Technology Co., LTD.

COMPANY ADDRESS:

Room 1003, Building 1, No.17, Lianyungang Road, Shibei District, Qingdao City, Shandong Province, China, 266700

This schedule identifies the Certified Product(s) on which the PAS-Mark and CSi Licence Number may be used.

AS 4666:2012 Insulating glass units

(Including Amendment, No1:2018)

IGU SYSTEM DESCRIPTION	
Types of substrates:	Annealed, Heat Treated, Coated, Patterned, Laminated, Low E Hard Coated, Low E Soft Coated. Any combination of the above substrates.
Types of sealants:	**Primary**: YG-838, Weihai Yuguang Sealer. **Secondary**: Zhengzhou Zhongyuan Two-Component Silicone, MF881
Spacer bar description:	Anodized Aluminium spacer, Supplier: Langfang Jianxing Weiye.
Spacer bar width:	6mm, 9mm, 12mm, 15mm, 16mm, 18mm, 19mm, 20mm, 24mm and 27mm
Desiccant:	Desiccant filled 4 sides, Type 3A Molecular Sieve (Shandong Natergy).
IGU Void fill:	1. Atmospheric Air filled
Construction components & Fabrication technique:	Mechanical application by automated machine, 4 bent corners continuous strip with metal straight line connector by Langfang Jianxing Weiye.
Long Term Test Report Number:	W02310500153E
Next Long-Term Test Report Due Date:	17, October 2025

This schedule supersedes any previously issued schedule.

CSi Licence Number: 7552
Certification Issue Date: 14 March 2025
Certification Expiry Date: 15 April 2026
CSi Schedule Number: CSi Lic No. 7552-2025-03-S1-R0

Certification Review Date: 28 February 2025
Next Annual Review Date: 1 April 2026
CSi Database ID Number: 1000051

PAS-Mark Product Conformance

Azma Khan
Managing Director

JAS-ANZ
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Insulating Glass (IGU) consists of two or more glass panes separated by a spacer and sealed to create an airtight cavity, typically filled with air or energy-efficient gases like argon.
This design provides excellent thermal insulation (reducing heat loss/gain), noise reduction, and UV protection while preventing condensation.
Available in various configurations (double/triple glazing) and glass types (clear, tinted, Low-E, etc.), IGUs enhance energy efficiency and comfort in modern buildings.



BETTER GLASS, BRIGHTER TOMORROW

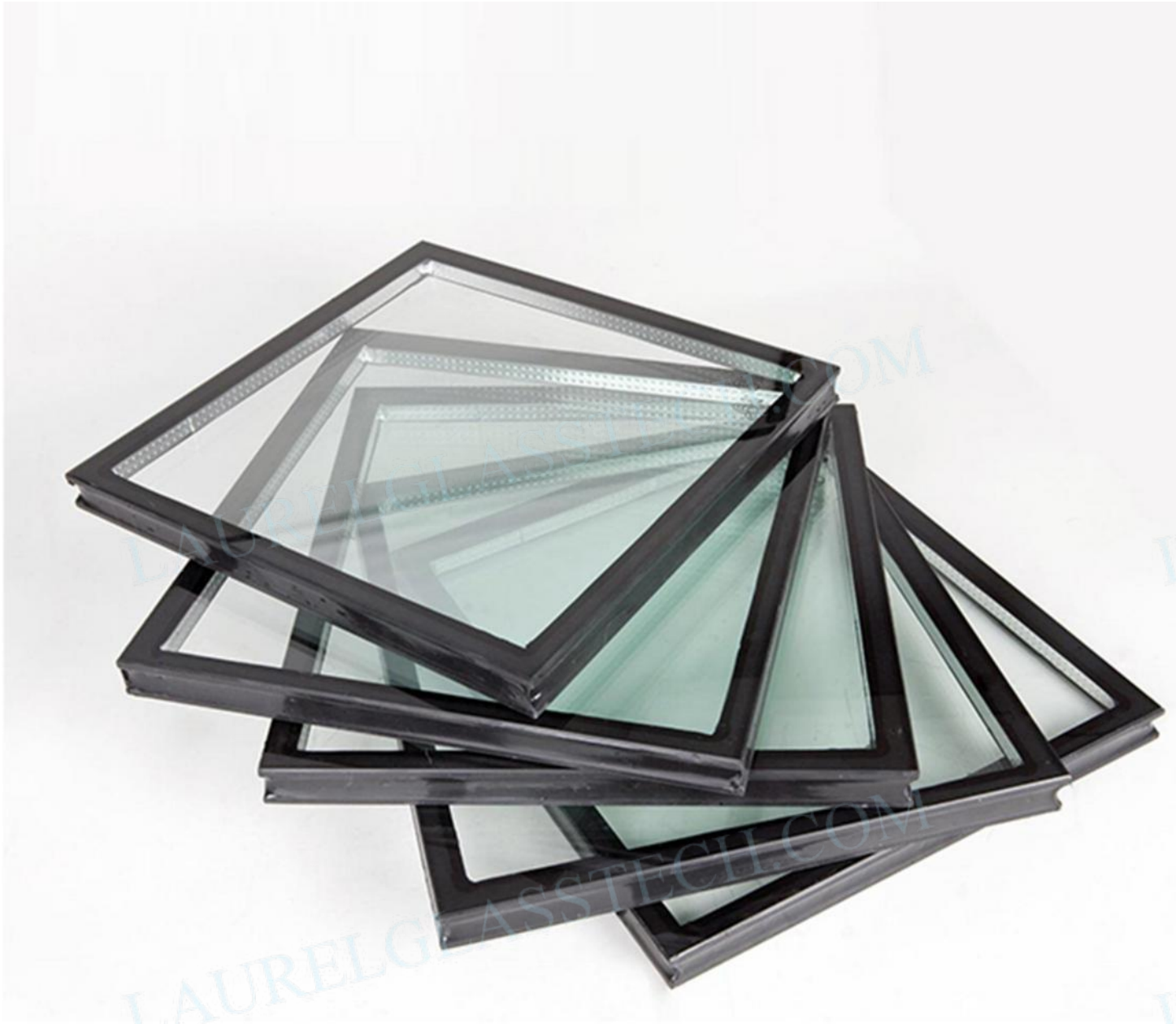
The story of insulating glass reflects humanity's quest for better energy efficiency:

Early Stages (1865-1930s)
- Thomas Stetson's pioneering double-glazing patent
- Basic air gap designs in early 20th century buildings

Modern Era (1940s-1990s)
- Post-WWII mass production with aluminum spacers
- 1983 Low-E coating breakthrough
- Noble gas fills enhance thermal performance

21st Century Advances
- Warm edge spacer technology (TPS/4SG)
- Triple/quad glazing for extreme climates
- Emerging smart glass integrations

At LAUREL GLASS, we prioritize environmental sustainability and believe in energy-efficient solutions for a healthier PLANET.



Core Advantages of IGU

- **Thermal Insulation**
- **UV Protection**
- **Energy Efficiency**
- **Condensation Resistance**
- **Noise Reduction**
- **Aesthetic Flexibility**
- **Natural Light Optimization**
- **Safety & Security (Tempered/Laminated IGU)**

*Heat soak testing eliminates nickel sulfide (NiS) and significantly reduces the risk of spontaneous breakage in tempered glass.

IGU Structure Variants

Double Glazing (2 Glass + 1 Cavity)
Balance of cost and performance for most climates.

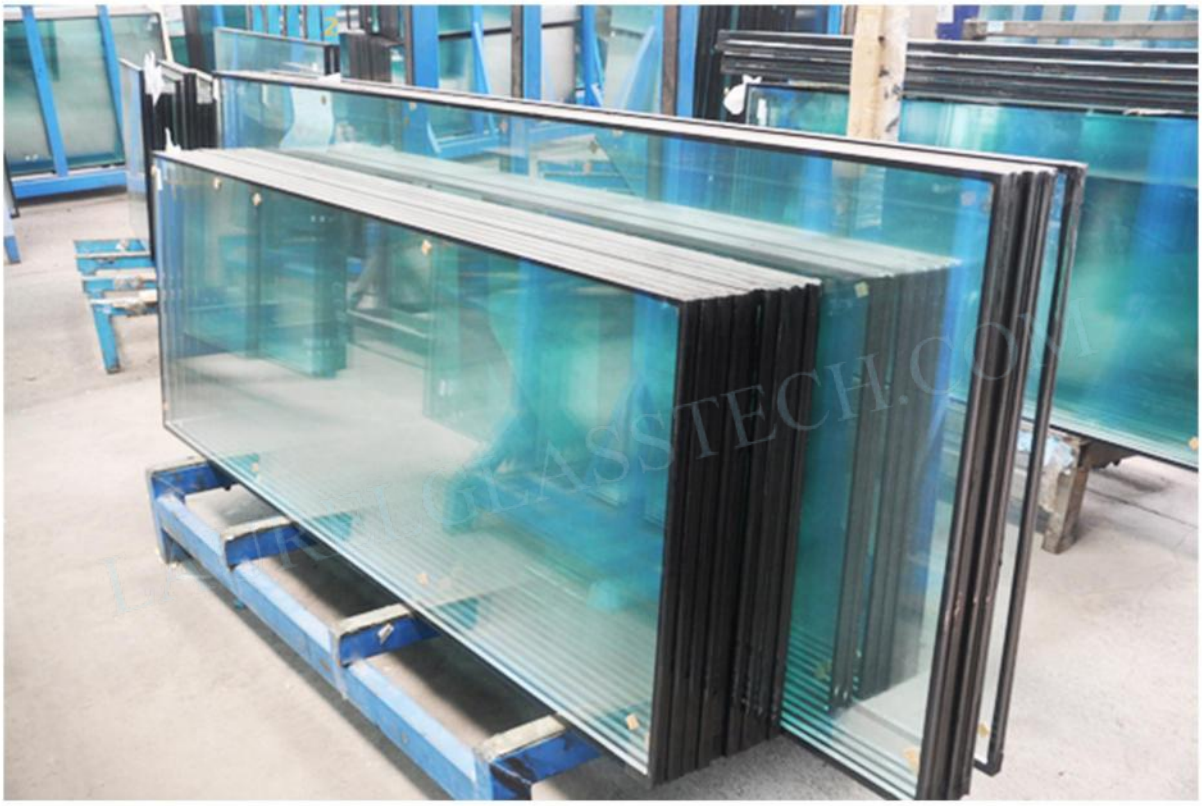
Triple Glazing (3 Glass + 2 Cavities)
Extreme insulation (U-value≤0.5)
for Arctic/passive house projects.

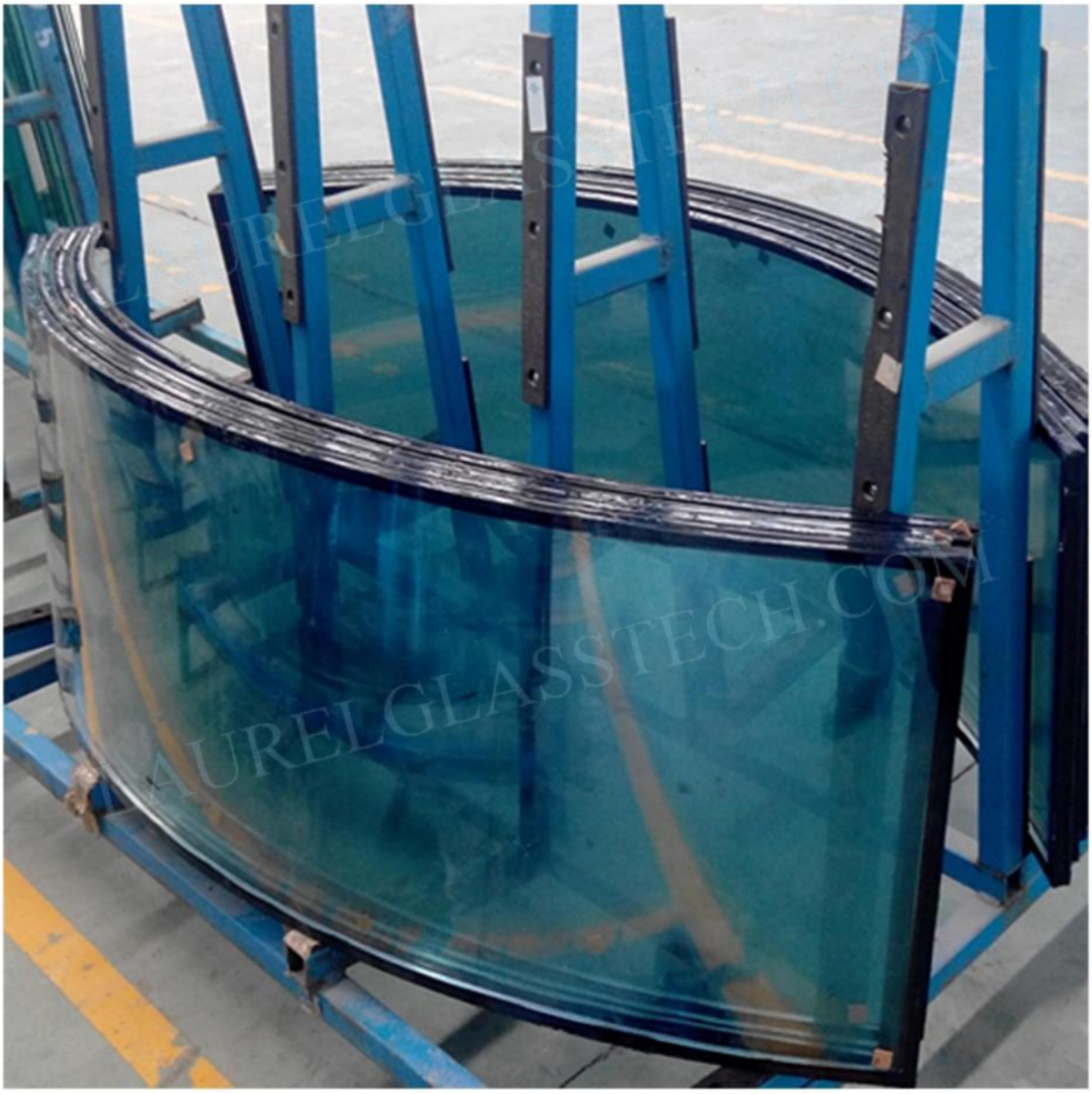
Laminated Glass IGUs
The optimal choice for skyscrapers due to its excellent safety, thermal insulation, 99% UV protection, and resistance to wind loads.

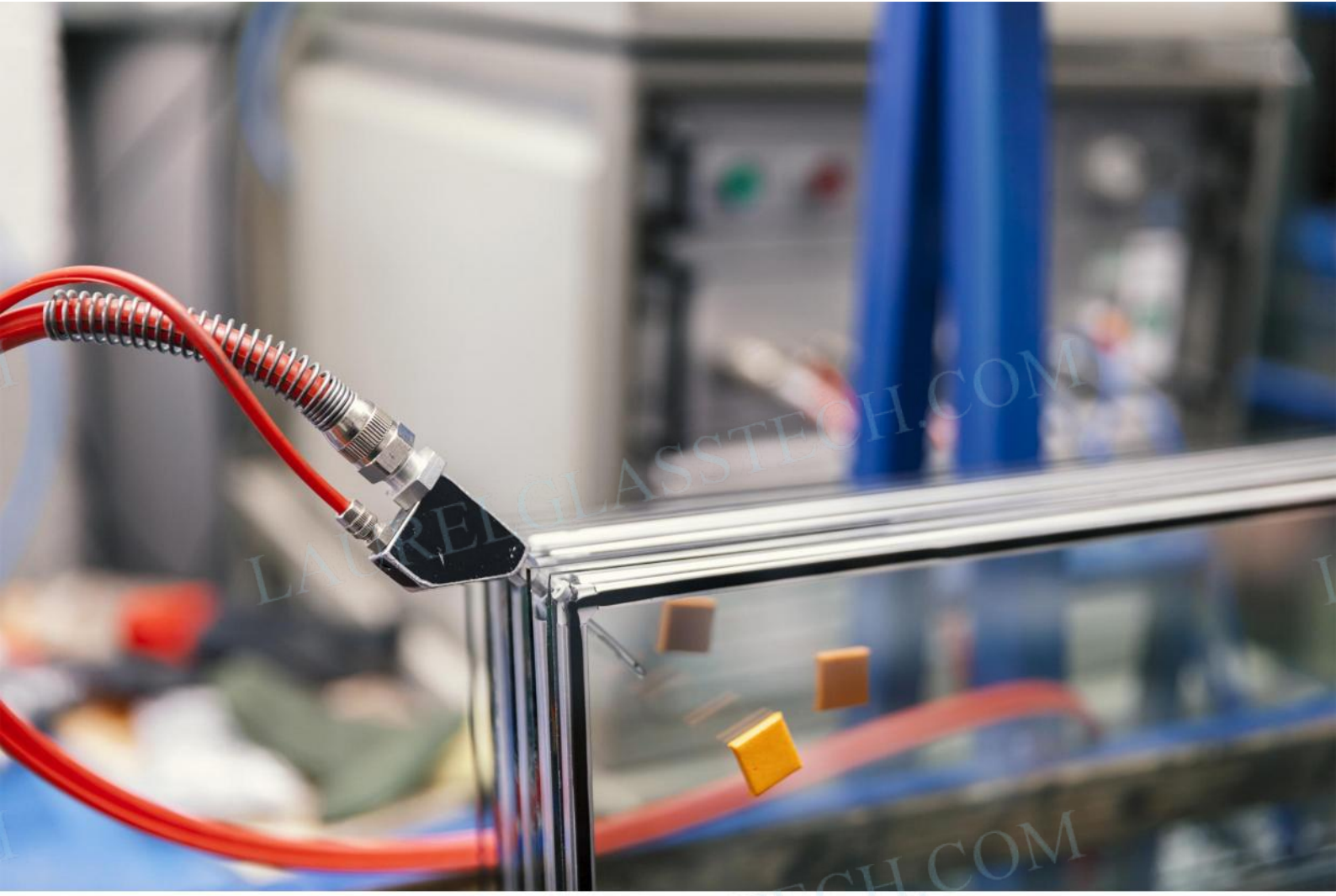
Curved Tempered IGUs & Custom Shapes
Asymmetrical architectural design
freedom for avant-garde facades and skylights.

Unequal Cavities
Optimize acoustic/thermal performance.









Gas Fill Options

Type	Performance	Best For
Air	Standard insulation	Budget-friendly projects
Argon	30% better insulation than air	Energy-efficient builds
Vacuum	Near-zero heat transfer (~0.1 W/m²K)	Future-tech solutions

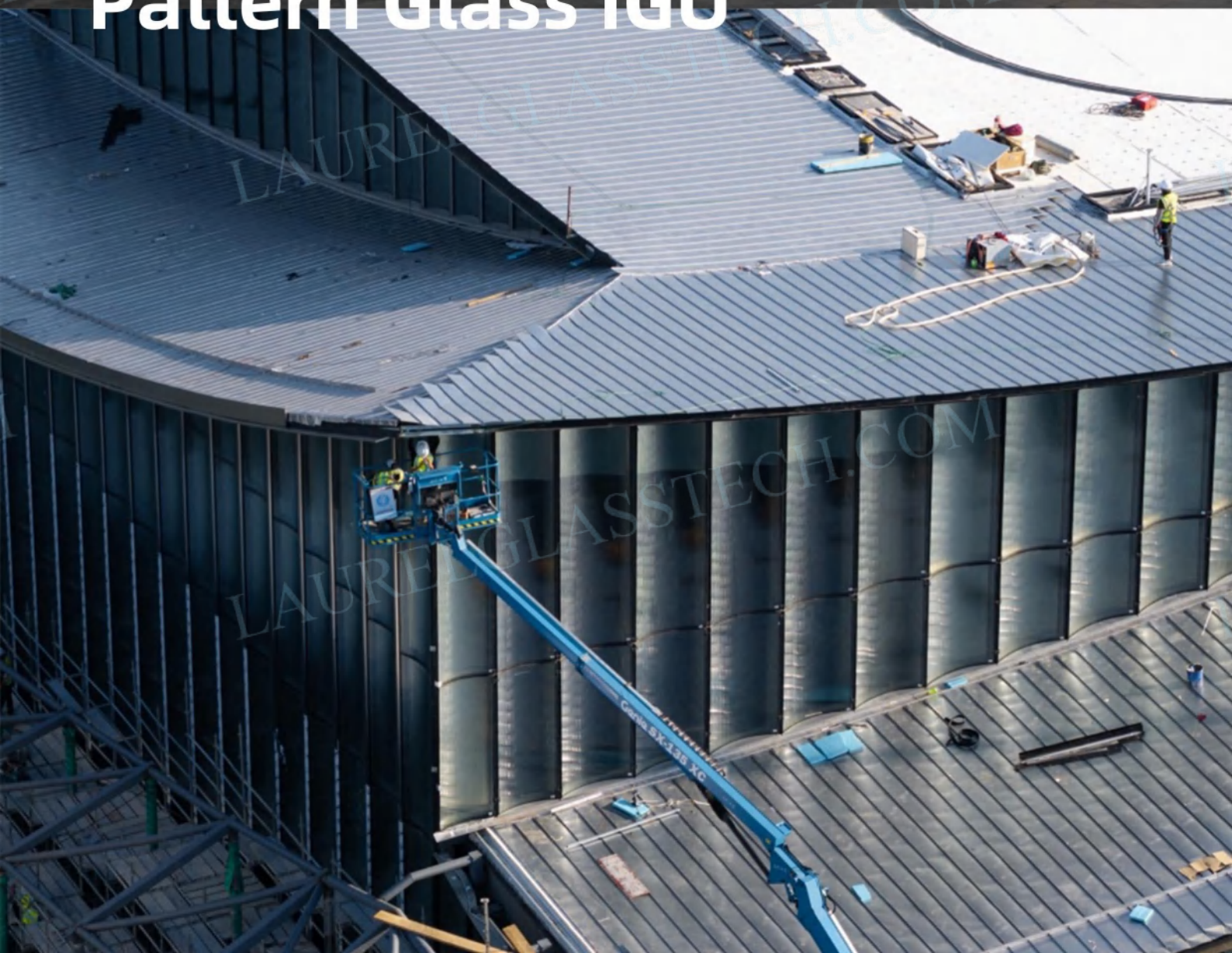
Glass Options

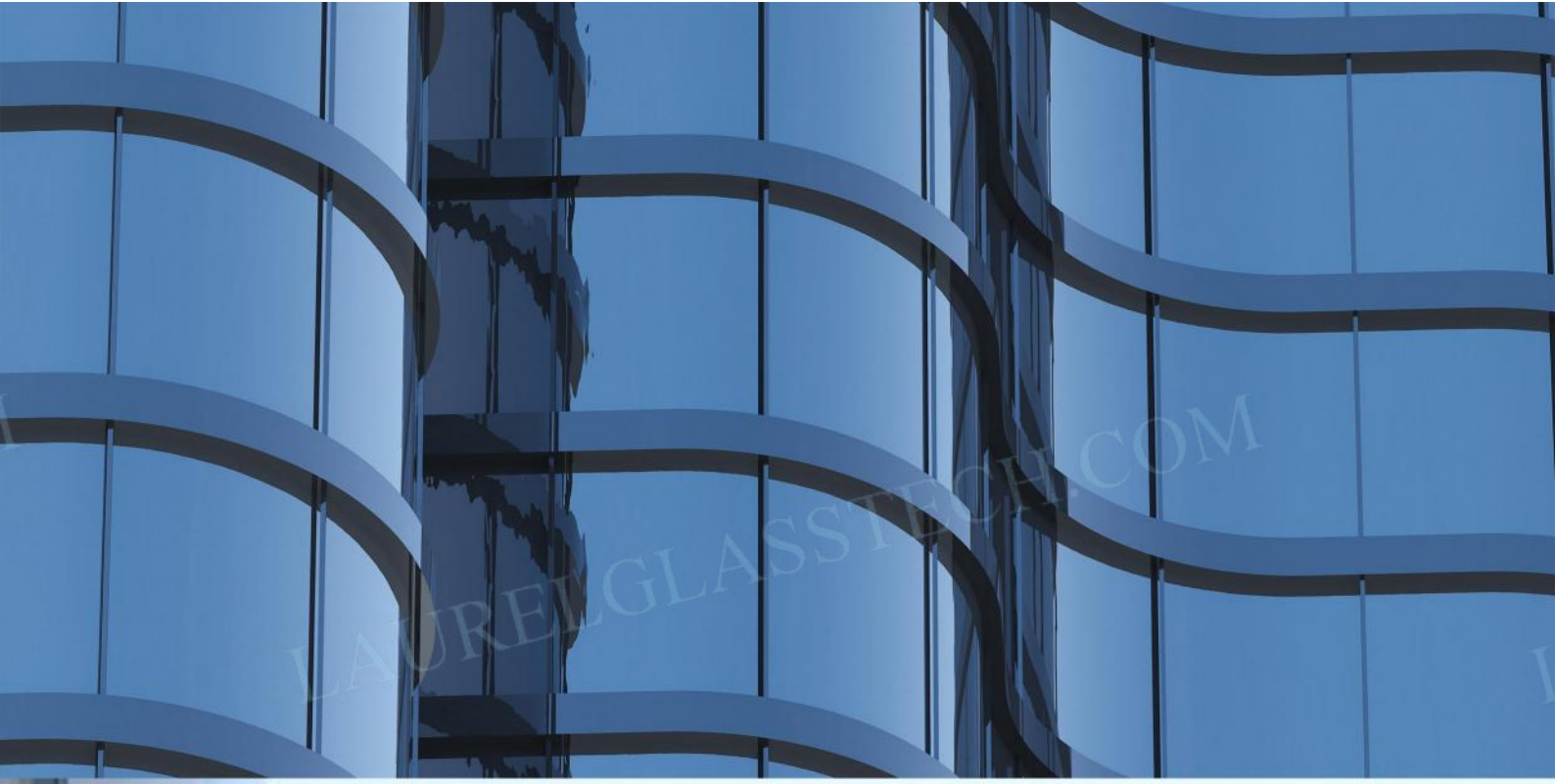
Type	Key Benefit
Clear Float	Cost-effective clarity
Ultra-Clear (Low-Iron)	91% VLT, no greenish tint
Tinted (Bronze/Gray/Blue)	Solar control + aesthetics
Coated (Reflective/Low-E)	Energy savings without blinds
Fire-Rated	60-120 minute integrity/insulation
Tempered/Half-Tempered	Impact resistance (+ heat soak option)
Patterned (Frosted/Textured)	Privacy + diffuse light
Silk-Screened (Bird-friendly)	Custom logos/designs + bird collision prevention





Pattern Glass IGU





Curved Glass IGU





Spacer Systems

(Aluminum v.s. Warm Edge Spacer)

Type	Pros	Cons	Best For
Aluminum	High strength, low cost	Thermal bridge (edge condensation)	Non-extreme climates
TGI (Stainless Steel Hybrid)	Durable, 30% warmer than aluminum	Moderate cost	High-humidity areas
TPS/TPSS (Thermoplastic)	**Zero metal**, seamless, best condensation resistance	Limited size flexibility	Passive houses
4SG (Silicone Hybrid)	**Superior longevity** (50-year lifespan), structural bonding	Premium price	Landmark buildings

TGI Spacer is a hybrid warm-edge insulating glass spacer consisting of stainless steel and a low-conductivity thermoplastic. It can be used in commercial, residential and architectural glazing systems.

TPS/TPSS (ThermoPlastic Spacer) spacer system is a one-piece, multi-tasking solution designed to deliver unmatched performance and reliability for insulated glass units, improving energy efficiency and resists moisture and gas leaks.
It is a warm edge spacer, meaning it has lower thermal conductivity than traditional aluminum spacers, reducing heat transfer and condensation.

4SG Spacer

4SG is the abbreviation of Four Structural Glazing, which can also be understood as Forever Saving Energy, and is a butyl-based, reactive thermoplastic warm edge system with integrated desiccant. It completely replaces the conventional edge sealing system with a spacer, desiccant, and primary sealant, optimally assuming the functions of both the spacer profile and the sealant while eliminating the metal thermal bridge.
A high-performance warm edge system demonstrates permanent gas tightness and the best thermal values. In addition to providing maximum energy efficiency, the flexible thermoplastic spacer offers unlimited creative freedom and a unique aesthetic.

4SG spacers are provided by Kommerling Germany, so the insulated glass made of 4SG spacer is also called Ködispace 4SG insulated glass.
Ködispace 4SG is an extremely robust and resilient thermoplastic warm edge system for multi pane glazing, which is ideally suited for use in structural glazing façades.
The additional chemical bonding to glass and silicone edge sealant creates extremely tight and durable gas-filled glass façades.

*Spacer widths from 6 mm to 20 mm possible



4SG IGU SUPERIOR PERFORMANCE

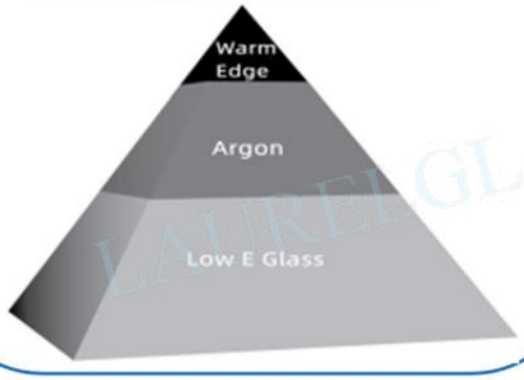
Long-term Energy-saving

▶ Minimal Argon gas leak

Provide superior tight seal that would prevent the leakage of gas from the Interpane cavity between panes of glass

▶ Adapt to stresses caused by thermal expansion and contraction

IGU energy contribution rate



Impeccable appearance

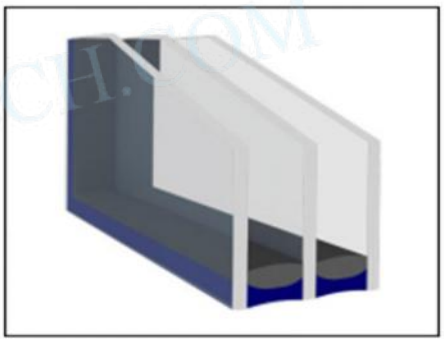
▶ No Butyl sealant overflow

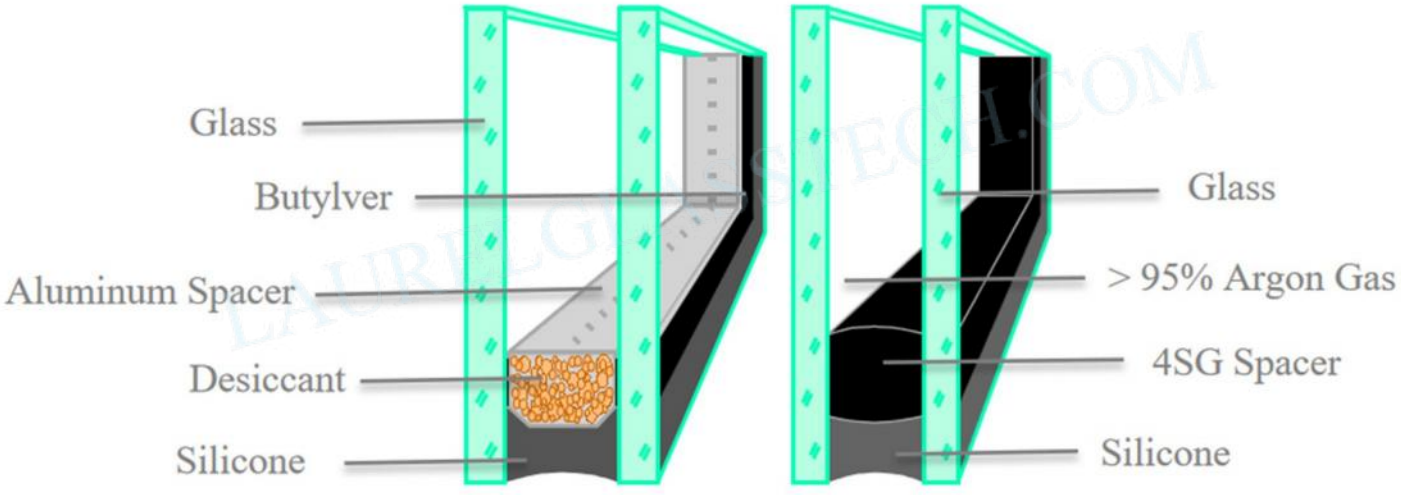
▶ No Desiccant leaks

▶ Spacer widths from 6 mm to 20 mm possible

▶ Individual shape design

▶ Reduce glass edge deformation and improve curtain wall imaging



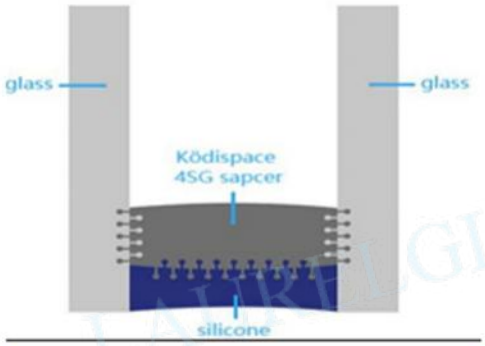


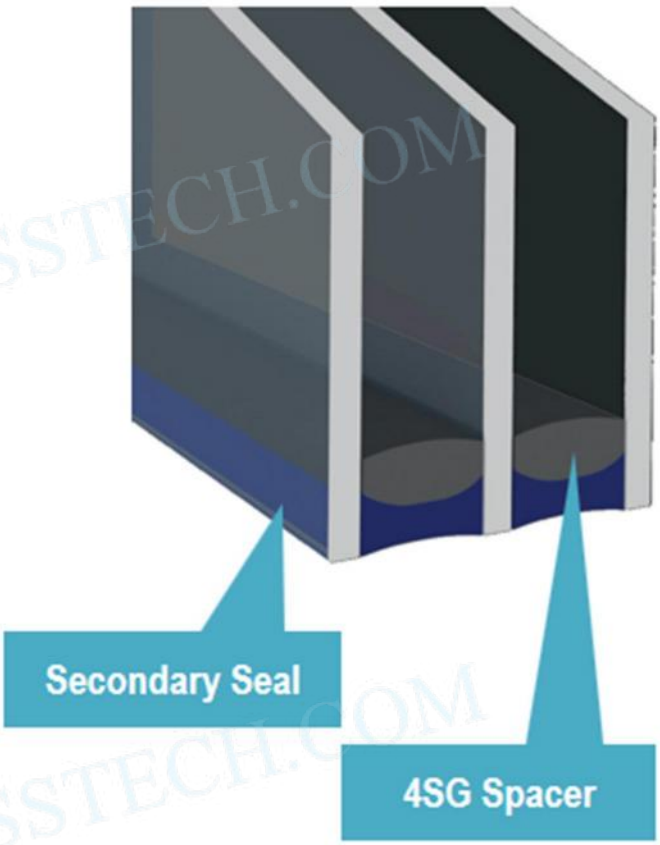
Traditional IGU 4SG IGU

4SG IGU SUPERIOR PERFORMANCE

Long-lasting seal

- 2-3 times longer usage time than traditional insulating glass
- 30 years warranty
- Perfect sealing and acoustic performance
- Additional chemical bonding to glass and silicone secondary sealants



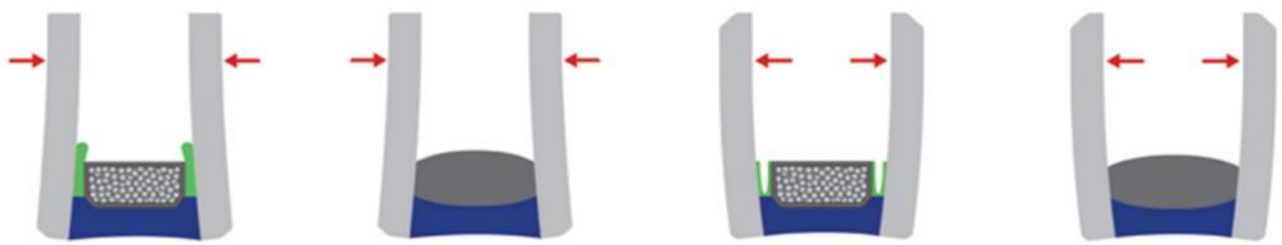


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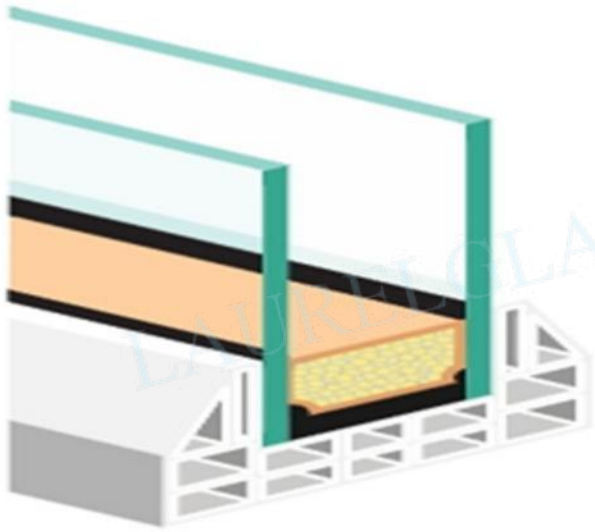
THE RESILIENT SYSTEM

The main stress in the sealing of box spacer profiles is on the butyl applied to both sides.
Expansion and contraction of the insulating glass caused by climatic stress
leads to enormous strain in the butyl.
This permanent stress caused by compression and elongation of the primary seal,
can cause seal failure over time.
However the edge bond with KÖDISPACE 4SG remains elastic
which results in considerably less stress on the bond and hence greater longevity.

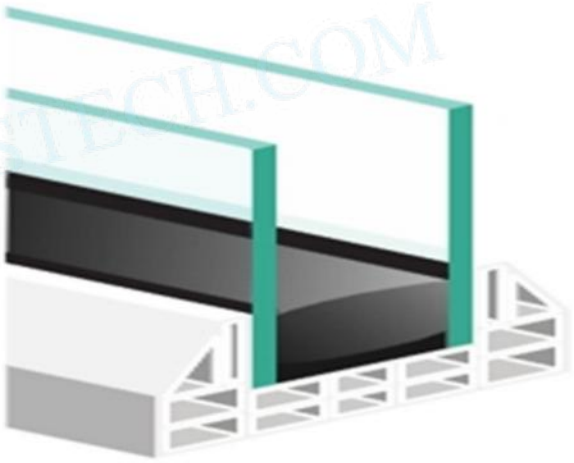
+ Excellent compensation of climatic stress
+ Optimal sealing barrier against gas loss and penetrating moisture
+ Absolutely tight joint due to CNC application
+ No extra butyling of joints and corners required



4SG SPACER V.S. TRADITIONAL SPACER



Aluminum Spacer



4SG Spacer

Comparative calculation of heat conduction efficiency between 4SG windows and aluminum strip windows

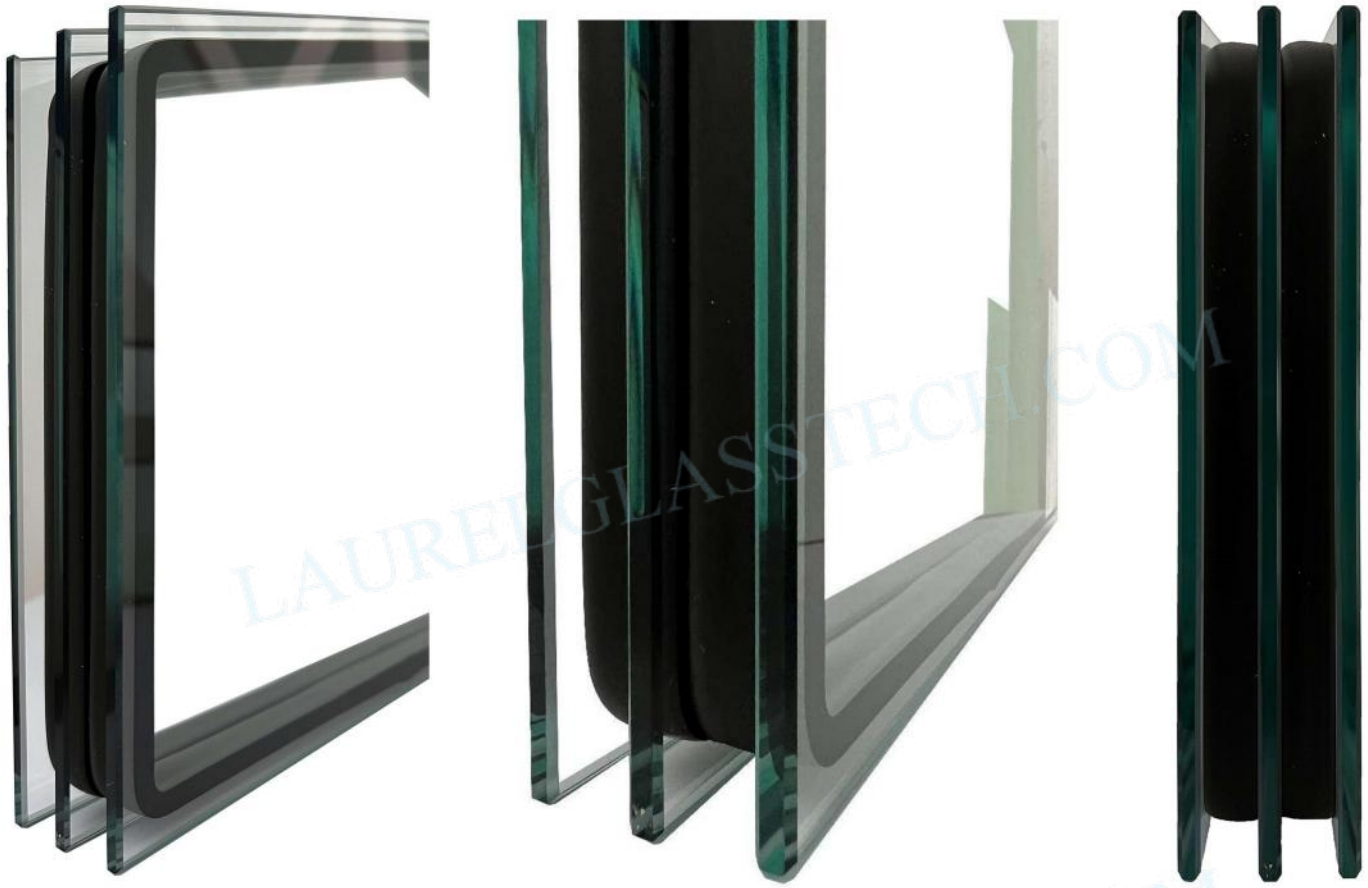
Thermal efficiency of windows			
Window frame	Uf=1.54 W/m²K		
Spacer	4SG	Aluminum	Warm Edge
ψ	0,038 W/mK	0,108 W/mK	0,057 W/mK
Glass	Ug=1.15 W/m²K		
Glass width	1,23 m(4,03ft)		
Glass height	1,48 m(4,9ft)		
Frame width	0,12 m(0,4ft)		

Uw=1,51 W/m²K (4SG)

Uw=1,69 W/m²K (Aluminum)

Conclusion:The thermal conductivity of 4SG is significantly better than aluminum spacer.

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ADVANTAGE OF 4SG SPACER

Long-term Energy-saving

Long-lasting Seal

Impeccable Appearance

Seamless Connection

Fully Automated Production System

Special-shaped / Multiple Cavities

Elastic Edge Seal

Extreme Environment Adaptability

No Butyl Sealant Overflow

No Desiccant Leaks

No Gas Loss

Minimization of Condensation

Reduce Heat Loss and Energy Consumption

Perfect Acoustic Performance

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LOW-E GLASS

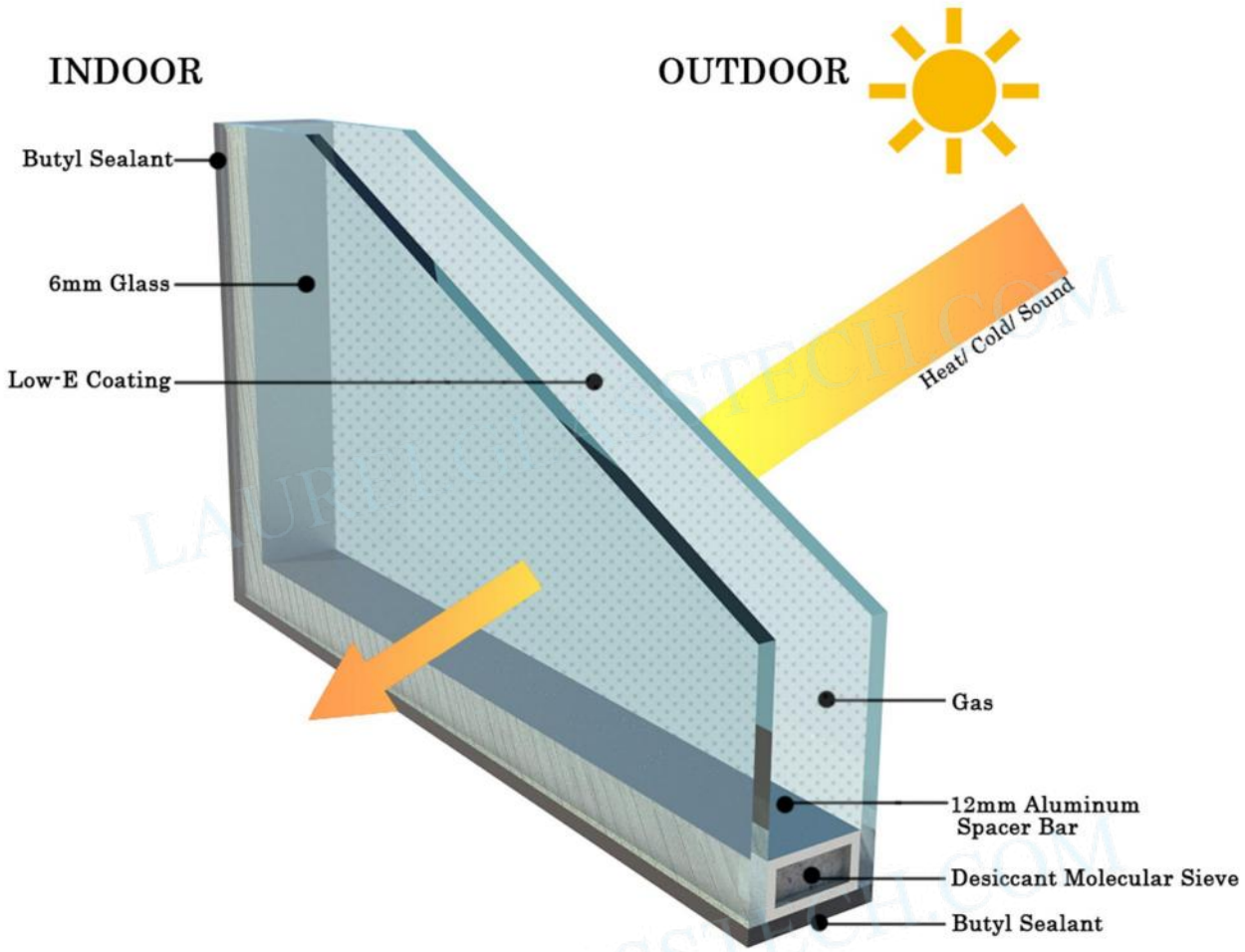


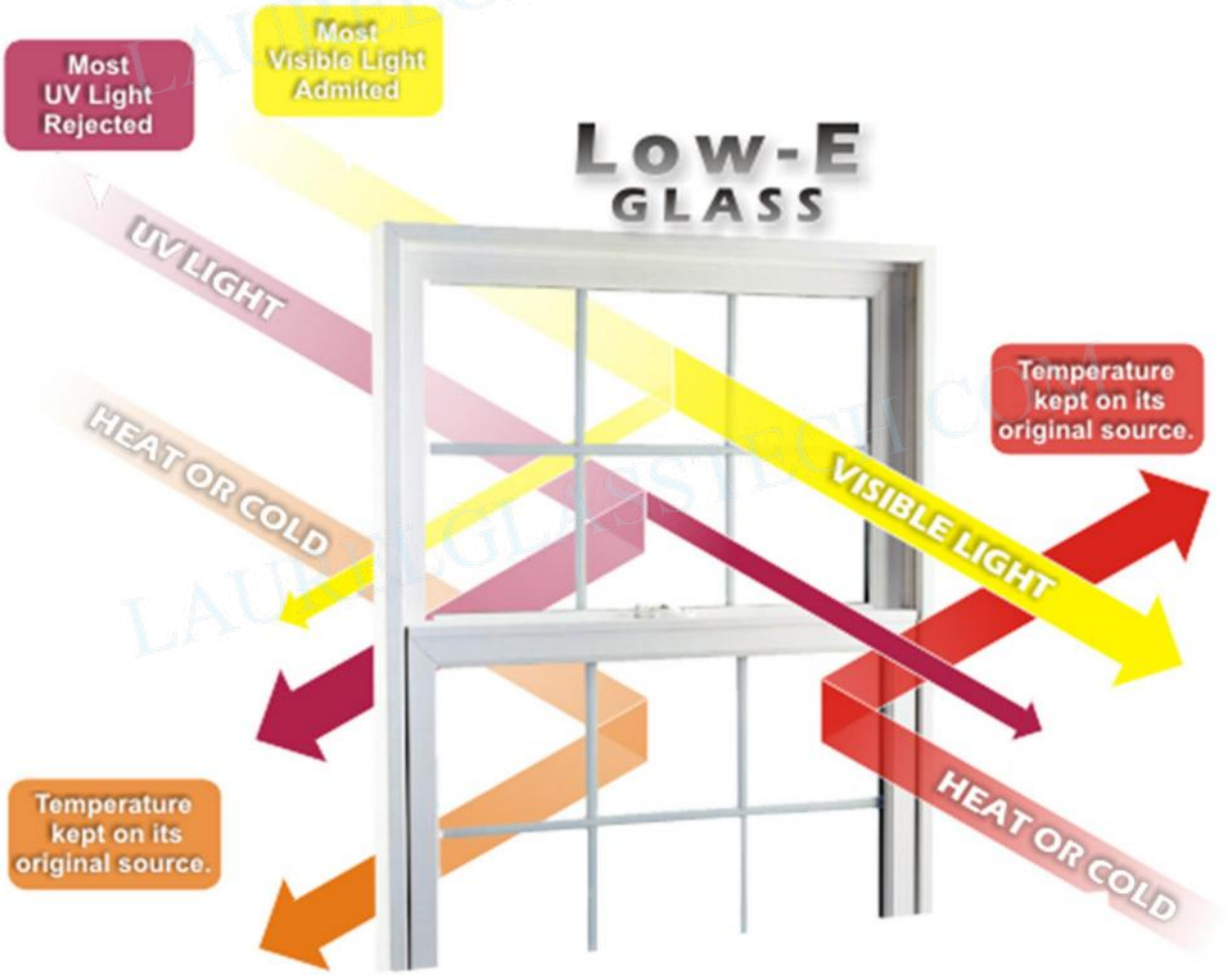
Low E

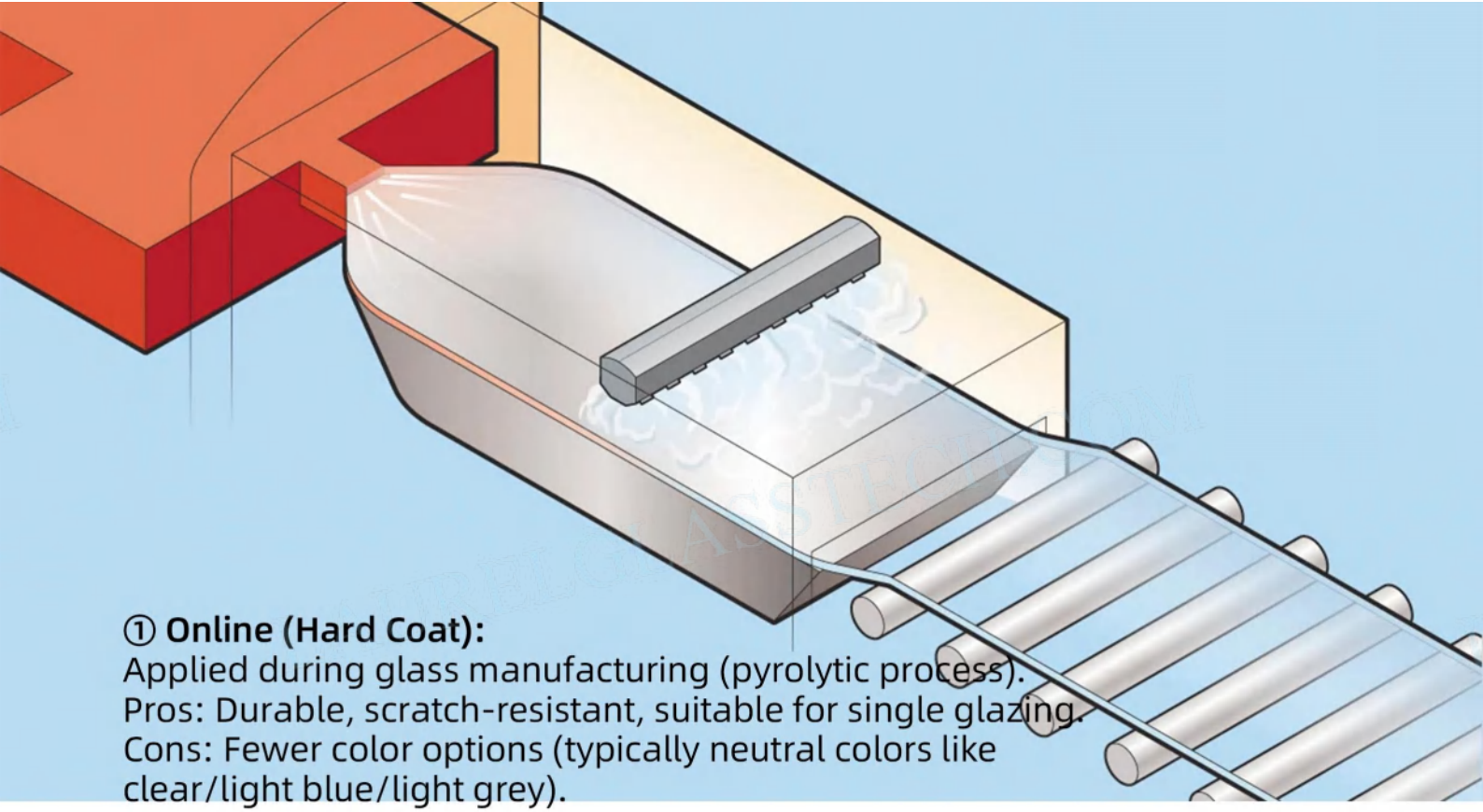
Low-E glass, a kind of coated glass, short for low emissivity glass, is a type of energy-efficient glass that is designed to minimize the amount of heat transfer through the glass. It has a microscopically thin, transparent metallic or oxide coating that reflects infrared (heat) radiation while allowing visible light to pass. The coating's emissivity (ε) determines its efficiency. It is commonly used in curtain walls, windows, and doors to improve the thermal performance of buildings, reducing energy consumption for heating and cooling, and providing greater comfort for occupants.

Low-E glass features a thin, transparent coating made of metal or metal oxide that reflects infrared radiation (heat) while still allowing visible light to pass through. This coating helps keep heat inside the building during cold weather and prevents excess heat from entering the building during hot weather, reducing the need for heating and air conditioning.

Offline low-E coatings typically offer better energy efficiency and solar control compared to online low-E coatings. Whereas online low-E glass tends to be more cost-effective and scratch resistant than offline low-E glass.


INDOOR
OUTDOOR
Butyl Sealant
6mm Glass
Low-E Coating
Heat/ Cold/ Sound
Gas
12mm Aluminum
Spacer Bar
Desiccant Molecular Sieve
Butyl Sealant


Most
UV Light
Rejected
Most
Visible Light
Admited
Low-E
GLASS
UV LIGHT
HEAT OR COLD
Temperature
kept on its
original source.
VISIBLE LIGHT
HEAT OR COLD
Temperature
kept on its
original source.



① Online (Hard Coat):
Applied during glass manufacturing (pyrolytic process).
Pros: Durable, scratch-resistant, suitable for single glazing.
Cons: Fewer color options (typically neutral colors like clear/light blue/light grey).

② Offline (Soft Coat):
Applied post-production (magnetron sputtering).
Pros: Higher performance (lower U-value), diverse colors provide aesthetic flexibility for façades
(silver, grey, blue, green, bronze, gold, etc.).
Cons: Easy to scratch and oxidize; Requires edge deletion; handled carefully before sealing in IGUs.

Non-Silver (TCO) Low-E
Composition: Uses transparent conductive oxides (e.g., SnO_2).
Pros: Cost-effective, UV-blocking, neutral color.
Cons: Moderate thermal performance (higher U-value).
Best For: Budget-conscious projects in mild climates.

Single Silver Low-E
Structure: 1 layer of silver between dielectric layers.
Pros: Balanced performance (U-value ~1.1–1.5), clear/bluish tint.
Best For: Temperate regions (e.g., Europe, North China).

Double Silver Low-E
Structure: 2 silver layers for enhanced reflectivity.
Pros: Superior solar control (SHGC ~0.3–0.5), higher visible light (VLT >70%).
Best For: Hot summers/cold winters (e.g., U.S. Midwest, Central Asia).

Triple Silver Low-E
Structure: 3 silver layers + advanced dielectrics.
Pros: Ultimate insulation (U-value <0.8), neutral color, high VLT (~60%).
Best For: Extreme climates or passive houses.



Optimizing Low-E Glass Position in Insulated Glass Units (IGUs) for Different Climates

In a standard double insulating glass unit (IGU) there are four potential surfaces to which coatings can be applied: the first (#1) surface faces outdoors, the second (#2) and third (#3) surfaces face each other inside the IGU and are separated by a peripheral spacer which creates an insulating air space, while the fourth (#4) surface faces directly indoors.
The performance of Low-E glass varies significantly depending on its position within the double or triple glazing unit.
Here's how to optimize it for different climate zones:

Tropical Climates (e.g., Singapore, Dubai)
Recommended Position: Outer pane (#2 surface)
Why?
Reflects solar heat outward before it penetrates the glass
Reduces SHGC (Solar Heat Gain Coefficient) by up to 50% vs. clear glass
Maintains cooler indoor temperatures
Best Low-E Type: Double/Triple silver with high IR reflection

Subtropical Climates (e.g., Florida, Southern China)
Recommended Position: Middle pane (#3 surface in triple glazing)
Why?
Balances solar control with winter heat retention
Prevents excessive cooling loads while allowing passive heating in winter
Best Low-E Type: Double silver with moderate SHGC (~0.4)

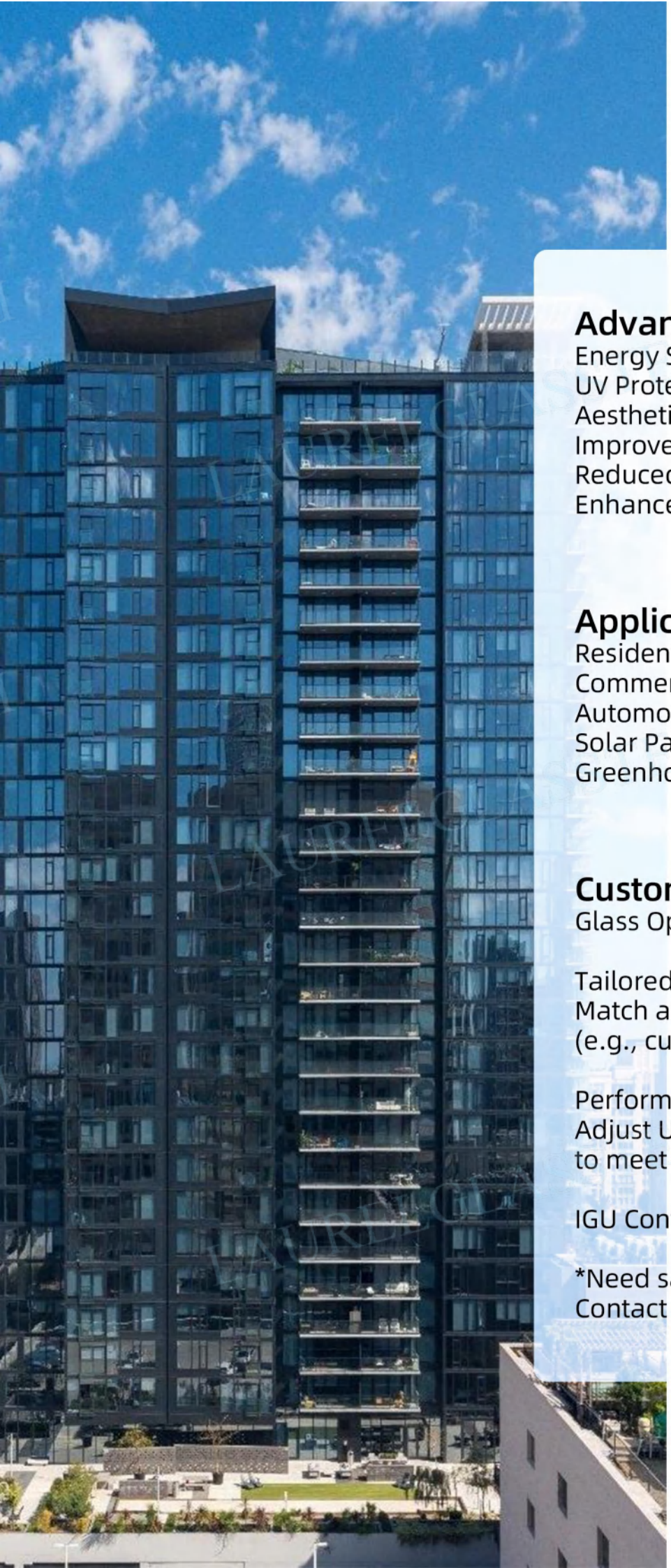
Temperate Climates (e.g., France, U.S. Northeast)
Recommended Position: Inner pane (#4 surface)
Why?
Traps interior heat during winter

Comparative Performance Data

Climate	Low-E Position	SHGC Range	U-value (W/m²K)	Energy Focus
Tropical	#2 Surface	0.2-0.3	1.8-2.2	Cooling
Subtropical	#3 Surface	0.3-0.45	1.3-1.6	Balanced
Temperate	#4 Surface	0.4-0.6	1.0-1.3	Heating
Cold	#2+#5 Surface	0.5-0.7	0.5-0.8	Insulation

*** Custom Solutions Available:**
We can engineer IGUs with climate-specific Low-E configurations and provide energy modeling for your exact location.





Advantages of Low-E Glass

Energy Savings
UV Protection
Aesthetics
Improved Comfort
Reduced Condensation
Enhanced Durability

Applications

Residential Buildings
Commercial Buildings
Automotive Industry
Solar Panels
Greenhouses

Custom Services:

Glass Optical Parameter Test

Tailored Colors:
Match architectural designs
(e.g., custom metallic hues).

Performance Parameters:
Adjust U-value, SHGC, and VLT
to meet project needs.

IGU Configuration Suggestion

*Need samples or technical specs?
Contact us!

Double Silver Low-E Insulated Glass Performance Parameters

Low-E Series	Product Configuration	Color	Visible Light (%)			ASHRAE				
			Tvis	Rvis		U Value (W/㎡.K)		SC	SHGC	RHG (W/㎡.K)
				Outdoor	Indoor	Winter	Summer			
Insulated Glass (XEDB179 Coating on Position 2#)	6+12A+6C	Neural	71	11	12	1.65	1.59	0.48	0.41	313
	8+12A+8C	Neural	71	11	12	1.63	1.58	0.47	0.41	310
	10+12A+10C	Neural	69	11	12	1.62	1.57	0.46	0.4	303
Insulated Glass (XEDN175-D Coating on Position 2#)	6+12A+6C	Neural	66	10	11	1.67	1.62	0.45	0.39	299
	8+12A+8C	Neural	66	10	11	1.66	1.61	0.45	0.39	296
	10+12A+10C	Neural	64	10	11	1.64	1.6	0.44	0.38	289
Insulated Glass (XEDN169-D Coating on Position 2#)	6+12A+6C	Neural	61	13	13	1.66	1.61	0.41	0.36	273
	8+12A+8C	Neural	61	13	13	1.65	1.6	0.41	0.36	271
	10+12A+10C	Neural	59	13	13	1.63	1.58	0.4	0.35	265
Insulated Glass (XEDG160B Coating on Position 2#)	6+12A+6C	Light Grey	53	15	15	1.66	1.61	0.36	0.31	240
	8+12A+8C	Light Grey	53	15	15	1.65	1.6	0.36	0.31	239
	10+12A+10C	Light Grey	51	15	15	1.63	1.58	0.35	0.31	235
Insulated Glass (XEDG160E Coating on Position 2#)	6+12A+6C	Blue Grey	54	14	14	1.66	1.61	0.37	0.32	245
	8+12A+8C	Blue Grey	54	14	14	1.65	1.6	0.37	0.32	243
	10+12A+10C	Blue Grey	52	13	14	1.63	1.58	0.36	0.31	239
Insulated Glass (XEDG155B Coating on Position 2#)	6+12A+6C	Grey	50	18	19	1.64	1.58	0.32	0.28	215
	8+12A+8C	Grey	50	18	19	1.63	1.57	0.32	0.28	215
	10+12A+10C	Grey	48	17	18	1.62	1.56	0.32	0.27	212
Insulated Glass (XEDG150B Coating on Position 2#)	6+12A+6C	Grey	46	22	22	1.62	1.56	0.29	0.25	195
	8+12A+8C	Grey	45	22	22	1.61	1.55	0.29	0.25	194
	10+12A+10C	Grey	44	22	22	1.6	1.54	0.29	0.25	192
Insulated Glass (XEDG145B Coating on Position 2#)	6+12A+6C	Grey	42	26	25	1.63	1.56	0.27	0.23	180
	8+12A+8C	Grey	42	26	24	1.62	1.55	0.27	0.23	180
	10+12A+10C	Grey	41	25	24	1.6	1.54	0.26	0.23	178
Insulated Glass (6+12A+6C Coating on Position 2#)	XEDB279	Green	60	9	11	1.65	1.59	0.37	0.32	245
	XEDN275-D	Green	56	9	11	1.67	1.62	0.35	0.31	234
	XEDN269-D	Green	52	11	13	1.66	1.61	0.33	0.28	219
	XEDG260B	Light Green	45	12	15	1.66	1.61	0.29	0.26	198
	XEDG260E	Blue Green	46	11	14	1.66	1.61	0.3	0.26	201
	XEDG255B	Light Green	42	14	19	1.64	1.58	0.27	0.24	184
	XEDG250B	Light Green	39	17	22	1.62	1.56	0.25	0.22	171
	XEDG245B	Light Green	36	19	25	1.63	1.56	0.24	0.2	161

Single Silver Low-E Insulated Glass Performance Parameters

Low-E Series	Product Configuration	Color	Visible Light (%)			ASHRAE				
			Tvis	Rvis		U Value (W/㎡.K)		SC	SHGC	RHG (W/㎡.K)
				Outdoor	Indoor	Winter	Summer			
Insulated Glass (XETN180 Coating on Position 2#)	5+6A+5C	Neural	73	10	11	2.5	2.54	0.67	0.59	445
	6+9A+6C	Neural	72	10	11	2.04	2.11	0.65	0.57	427
	6+12A+6C	Neural	72	10	11	1.85	1.85	0.65	0.56	424
	8+12A+8C	Neural	71	10	11	1.83	1.84	0.64	0.55	416
	10+12A+10C	Neural	69	10	11	1.82	1.83	0.61	0.53	399
Insulated Glass (XETS140 Coating on Position 2#)	5+6A+5C	Silver Grey	36	29	9	2.47	2.5	0.37	0.32	249
	6+9A+6C	Silver Grey	36	29	9	2	2.06	0.35	0.3	235
	6+12A+6C	Silver Grey	36	29	9	1.8	1.8	0.34	0.3	229
	8+12A+8C	Silver Grey	35	29	9	1.79	1.78	0.34	0.29	226
	10+12A+10C	Silver Grey	34	28	9	1.77	1.77	0.33	0.28	220
Insulated Glass (XETS150 Coating on Position 2#)	5+6A+5C	Silver Grey	45	29	12	2.44	2.47	0.41	0.36	280
	6+9A+6C	Silver Grey	44	29	12	1.97	2.02	0.4	0.34	266
	6+12A+6C	Silver Grey	44	29	12	1.76	1.75	0.39	0.34	260
	8+12A+8C	Silver Grey	44	28	12	1.75	1.74	0.39	0.33	256
	10+12A+10C	Silver Grey	43	28	12	1.74	1.72	0.37	0.32	249
Insulated Glass (XETS160 Coating on Position 2#)	5+6A+5C	Light Grey	54	22	10	2.47	2.5	0.47	0.41	318
	6+9A+6C	Light Grey	53	22	10	2	2.06	0.45	0.39	303
	6+12A+6C	Light Grey	53	22	10	1.8	1.8	0.45	0.39	298
	8+12A+8C	Light Grey	52	22	10	1.79	1.78	0.44	0.38	293
	10+12A+10C	Light Grey	51	21	10	1.77	1.77	0.43	0.37	284
Insulated Glass (XETG150 Coating on Position 2#)	5+6A+5C	Grey	45	22	9	2.48	2.51	0.43	0.38	293
	6+9A+6C	Grey	44	22	8	2.02	2.08	0.41	0.36	277
	6+12A+6C	Grey	44	22	8	1.82	1.82	0.41	0.35	271
	8+12A+8C	Grey	44	22	8	1.81	1.81	0.4	0.35	267
	10+12A+10C	Grey	43	21	8	1.79	1.79	0.39	0.34	259
Insulated Glass (XETG141 Coating on Position 2#)	5+6A+5C	Bronze	36	25	10	2.48	2.51	0.35	0.31	242
	6+9A+6C	Bronze	36	25	10	2.02	2.08	0.34	0.29	228
	6+12A+6C	Bronze	36	25	10	1.82	1.82	0.33	0.29	222
	8+12A+8C	Bronze	35	25	10	1.81	1.81	0.33	0.28	219
	10+12A+10C	Bronze	34	24	10	1.79	1.79	0.32	0.28	214
Insulated Glass (6+12A+6C Coating on Position 2#)	XETS240	Green	30	22	9	1.8	1.8	0.26	0.22	177
	XETN280	Green	61	8	11	1.85	1.85	0.43	0.38	288
	XETS250	Green	37	21	12	1.76	1.75	0.29	0.25	195
	XETS260	Green	44	16	10	1.81	1.8	0.34	0.3	230
	XETG250	Green	37	17	8	1.82	1.82	0.3	0.26	203
	XETG241	Green	30	19	10	1.82	1.82	0.26	0.22	176

Online Low-E Glass Performance Parameters

Product Configuration	Thickness (mm)	Visible Light (%)			Solar light (%)			U-value (W/㎡.K)	SHGC	SC
		Tvis	Rvis		Tsol	Rsol	UVT			
			Outdoor	Indoor						
Single Panel (Pilkington EA)	3	82	11	12	69	11	57	3.7	0.72	0.83
	4	82	10	11	68	10	55	3.7	0.71	0.82
	5	83	11	12	68	10	53	3.7	0.71	0.82
	6	82	10	11	66	10	49	3.6	0.7	0.81
	8	81	10	11	62	9	45	3.6	0.67	0.77
	10	80	10	11	59	9	42	3.6	0.65	0.75
	12	80	10	11	57	8	43	3.6	0.63	0.73
Insulated Glass (Pilkington EA) The insulating glass unit consists of two glass panes of equal thickness with a 12mm air spacer. The exterior glass features an Energy Advantage coating on Surface #2, while the interior glass is clear float glass.	3	75	17	18	59	15	45	1.9	0.65	0.75
	4	74	16	17	56	14	42	1.9	0.63	0.73
	5	74	17	17	55	14	41	1.9	0.63	0.73
	6	73	16	17	52	13	37	1.8	0.62	0.711
	8	71	15	16	47	12	32	1.8	0.58	0.67
	10	69	15	16	43	12	29	1.8	0.56	0.64
	12	68	15	16	39	10	28	1.9	0.54	0.62

Product Configuration	Thickness (mm)	Light Properties		Thermal Properties				U-value (W/㎡.K)
		LT(%)	LR (Extra) %	DET%	ER%	SF%	SC	
Single Panel (AGC Sunergy Clear)	5	71	9	53	10	60	0.69	3.9
	6	71	9	52	9	60	0.69	3.9
	8	70	8	50	9	58	0.67	3.9
	10	69	8	48	9	57	0.65	3.9

Product Configuration	Thickness (mm)	Light Properties		Thermal Properties				U-value (W/㎡.K)	
		LT(%)	LR (Extra) %	DET%	ER%	SF%	SC	Air	Argon
Insulated Glass (AGC Sunergy Clear Coating on Position 2#)	5-9-5	64	13	45	12	53	0.61	2.2	1.9
	5-12-5	64	13	45	12	53	0.6	2	1.8
	5-15-5	64	13	45	12	52	0.6	2	1.8
	6-9-6	63	13	43	12	52	0.6	2.2	1.9
	6-12-6	63	13	43	12	52	0.6	2	1.7
	6-15-6	63	13	43	12	52	0.59	2	1.8
	8-9-8	62	12	40	11	50	0.58	2.2	1.9
	8-12-8	62	12	40	11	50	0.57	2	1.8
	8-15-8	62	12	40	11	50	0.57	2	1.8
	10-9-10	60	12	37	11	48	0.56	2.2	1.9
	10-12-10	60	12	37	11	48	0.55	2	1.7
	10-15-10	60	12	37	11	48	0.55	2	1.8

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Glossary

Insulating glass (IG) optical parameters are used to evaluate its light transmission, thermal insulation, and solar control performance.

1. Visible Light Transmittance (VLT / Tvis)
The percentage of visible light (380–780 nm) that passes through the glass.
Higher VLT improves daylighting but may increase glare and solar heat gain.

2. Visible Light Reflectance (VLR)
Percentage of visible light (380-780nm) reflected by glass surfaces.
Affects glare control and building aesthetics; high reflectance may cause light pollution.

3. Solar Transmittance (Tsol)
Percentage of total solar energy (300-2500nm) transmitted through glass.
Directly influences heat gain; lower Tsol reduces cooling loads but may limit daylight.

4. Solar Reflectance (Rsol)
Percentage of solar energy reflected by glass surfaces.
Higher Rsol improves solar rejection but may increase urban heat island effect.

5. Solar Heat Gain Coefficient (SHGC)
The fraction of total solar energy (including direct transmission and absorbed/re-radiated heat) that enters through the glass.
Lower SHGC provides better heat insulation (ideal for hot climates), while higher SHGC allows passive solar heating (beneficial in cold climates).

6. Ultraviolet Transmittance (UVT / Tuv)
The percentage of ultraviolet (UV) radiation (280–380 nm) transmitted through the glass.
Low UVT reduces fading of interior furnishings (achieved via Low-E coatings or laminated interlayers).

7.U-value ($W/m^2 \cdot K$)
Measures how much heat escapes through $1m^2$ of glass for every 1°C temperature difference between indoor and outdoor environments.
Lower U-value = Better insulation.

8. Shading Coefficient (SC)
The ratio of SHGC of the glass to that of 3mm clear monolithic glass (SC = SHGC ÷ 0.87).
Lower SC (e.g., 0.3–0.5) indicates better solar control.

These parameters collectively determine the optical performance of insulating glass and should be selected based on architectural requirements (e.g., daylighting, thermal insulation, glare control).



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SUSTAINABLE GLASS FOR A GREENER TOMORROW

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