



Welcome to the world of glass...

# CITIGLASS GROUP LTD.

The Perfect Glass Maker  
With the most advanced technology  
& professional expert team



<http://www.citiglass.cn>

# Brief Introduction-

Welcome to CitiGlass Group!

CitiGlass Group Ltd is one of the largest glass manufacturers in China. We produce float glass, tempered glass, laminated glass, insulated glass, double-glazing unit, LOW-E glass, U glass, pattern glass, figure glass, frosted glass, fireproof glass, bulletproof glass, wired glass, low iron glass, LED glass, electrochromic glass, hologram glass, intelligent glass, and glass ceramic, borosilicate glass, heat resistant glassware, casserole, ... etc. The glass main application is for buildings and furnitures, windows and doors, glass ballustrades, ... etc.



CITIGLASS GROUP also can satisfy your demands of window and doors. We own an aluminium factory for finished window and door production, and we are manufacturing high performance integration finished aluminum windows and doors. Such as folding door, lift and sliding door, inward tilt and parallel sliding door, inward tilt-turn window, casement door, window and etc. Our marketing positioning is to provide best quality, high performance integrated door and window systems as well as tailor-made technical solutions, for project requirements and turn-key projects.



The company was established in the year of 1999, and has become a rapid-developing manufacturer of most kinds of glass. CitiGlass is equipped with advanced float glass production line, tempering furnace, insulating glass and laminated glass production line, bending glass production line, straight & special shaping edging grinders, acid etched machine and other glass-processing machines.



We have three major glass plants in China, both in the south and the north, and we have acquired international quality approvals and certificates, such as ISO9001:2000, BS6206, CE, CSI approvals. We promise our customers with "Best Quality, Excellent Service and Prompt Delivery".

\*Guarantee—Your emails will be replied in 12 hours!





# Float Glass



Clear float glass is made of molten glass which flows through tweek to tin bath and then to lehr. While floating through the molten tin, the glass with gravity and the surface tension becomes smooth and flat at both sides.

Characteristics of the glass:

1. Smooth and flat surface and good vision.
2. Resistant to acid, alkali and corrosion.
3. Flexible size specifications minimizing cutting loss.
4. High mechanical tension for each level of glass processing.

Thickness: 2mm, 3mm, 4mm, 5mm, 6mm, 8mm, 10mm, 12mm, 15mm, 19mm, 22mm, 25mm.

Standard Sizes:

1500mmx2000mm, 60"x80" 1830mmx2440mm, 72"x96"  
2134mmx3300mm, 84"x130" 2440mmx3660mm, etc...

Opti-float



## Colored / Tinted Glass

Characteristics:

1. Excellent optical performance.
2. Stable chemical properties
3. Absorbing the heat energy of radiation light, saving energy.

Colors available:

Green, Blue, Brown, Bronze, Grey, Yellow and Black...

Thickness: normally 3 - 12mm



## Reflective Glass

The reflective glass refers to coating the surface of the glass with one or many layers of metal, alloy or metal compound film to effectively control the transmission of visible lights and low infrared. In light of the different performance, the reflective glass can be classified into the following: heat-reflecting glass, low-emissivity glass (low-E), electro pane, etc.





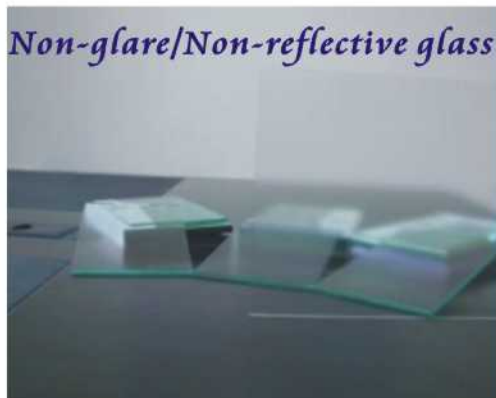
## Glass Cut-to-size for photo frames

Thickness: 2mm or 1.8mm

Sizes: 32"x40", 36"x48", 40"x60", 24"x36" ... etc

70x100, 60x80, 50x70, 40x50, 30x40, 24x30cm ...etc

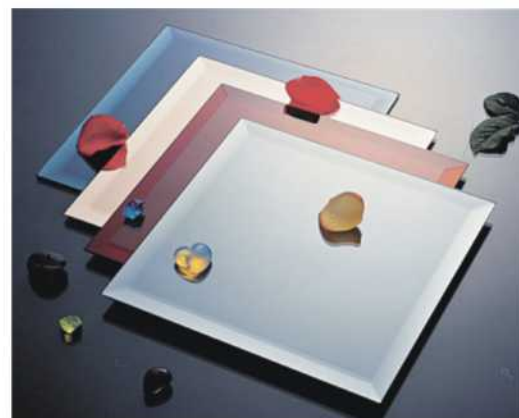
*Non-glare/Non-reflective glass* also available!



## Silver/Aluminium Mirrors

Silver mirror is made through a chemical sedimentation process. A sheet of specially treated silver is coated on quality float glass, followed by a sheet of special metal film instead of copper, and finished with two coatings (double-coating) of paint for chemical and physical protection. Copper free & lead free™ high quality mirrors.

\*Features: Higher anti-corrosion than normal copper mirror after edge grinding. With lead content less than 0.01% of mirror backing paint, the mirrors are able to achieve the vehicle mirror quality.



### \*Safety Mirror

Description Safety mirror with vinyl back, is produced by attaching an adhesive PE or PVC protective plastic film on the back of mirror, glossy film CAT I and Woven Fabric CAT II is available. It can prevent people from being hurt while mirror breaking.

\*Color Mirror Colors available: Bronze, gray, blue, green, golden, etc.

Thickness: 2-8mm

Maximum size: 1830mmx2440mm; 2440mmx3660mm.



Packing By strong sea-worthy wooden crates.





## Tempered Glass/ Toughened Glass

The process of tempered glass is to heat the original glass to a very high temperature and cool it down rapidly to form the surface compressive on the glass. According to the cooling method, it can be divided into the fully tempered glass and the heat strengthened glass (also called semi-tempered glass).

### Characteristics

The tempered glass is 3-4 times as strong as the common glass. Broken by the external force, it will become the bean-sized scrap, so as to lessen or avoid the injury to human body. The tempered glass has the virtues of high degree of precision, low rate of self-blast and without stressing flaw.

Thickness: 2mm to 25mm.



Shower Cabinet (6mm)

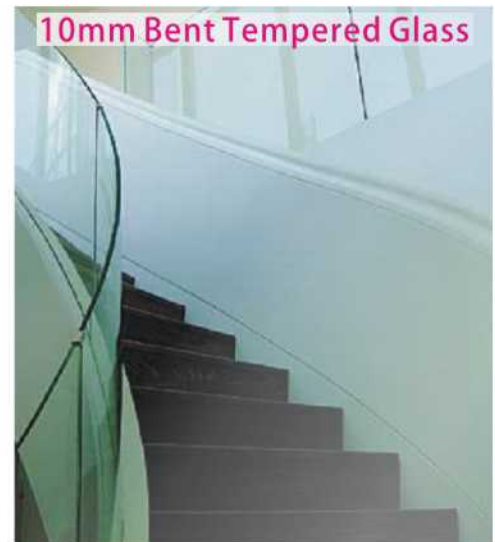
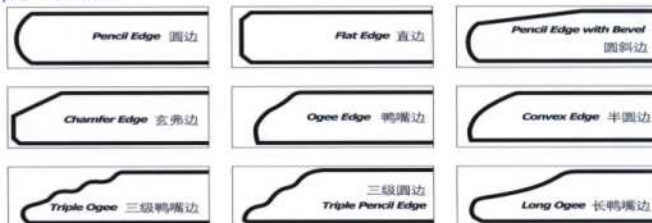
### Certified Approvals :

**CE(EN12150), BS6206, ASTM1048-97, JISR3206-96, DIN18516.**

## Curved Tempered Glass

Curved tempered glass is the curved-surface safety glass processed by heating the ordinary glass to fit certain arc and radius and then cooling it down suddenly to make the surface turned curved and the facial surface intensity increasing greatly. Curved tempered glass can meet the need for beauty of external glass of building.

Edges polished:



### Specifications

Maximum size: 7500mmx2400mm

Minimum size: 300mmx600mm

### Thickness:

2-10mm (R>500mm)

12-25mm (R>800mm)

### Packing:

By strong sea-worthy wooden crates.



Balustrade Glass



6mm thick  
Ground Glass for fireplaces

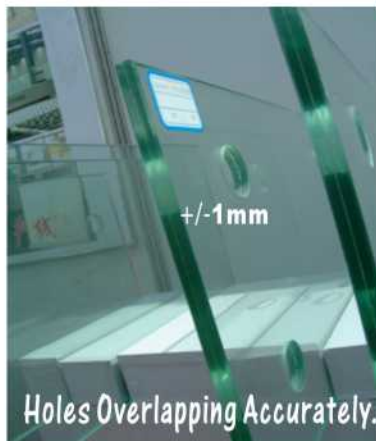


Fire Guard



# Laminated Glass/Sandwich Glass

Laminated glass is a combination of two or more glass sheets with one or more interlayers of plastic (PVB) or resin. In case of breakage, the interlayer holds the fragments together. This glass is particularly suitable where it is important to ensure the resistance of the whole sheet after breakage. It is produced using a heat and pressure process, sandwiching a flexible interlayer between layers of glass.



Furthermore, the interlayer provides a barrier against penetration. Tinted interlayer materials can be used to help minimise heat transmission, the PVB interlayer also gives the glass a much higher sound insulation rating, due to the damping effect, and also blocks 99% of transmitted UV light.

Quality control--Overlapping accuracy.

When we put the 2 pieces of glass together, the edges (and the holes) must be overlapped uniformly.

We make the difference of overlap no more than 1mm.

## Key Properties

- \* Increased safety factor; Resistant to shattering.
- \* Acoustic damping properties.

Maximum size: 3000mmx7500mm/ Minimum size: 300mmx300mm

Thickness: 4 -80mm

PVB color: Clear, milky, gray, blue, green, pink and bronze, etc. PVB

thickness: 0.38mm, 0.76mm and 1.52mm or above.



## Applications:

Skylight glazing, balconies, balustrade;

Automobile windshields;

Hurricane-resistant windows;

Storefronts, curtainwalls. Stair-railings, roof glazing.



# Insulated Glass/Double Glazed Unit(DGU)

Also called hermetically sealed units, meaning that the environment inside of the unit is isolated from the external environment. These units are produced with the intention of maximizing the thermal insulating properties of a gas contained in the space formed by the unit while at the same time providing clear vision through the unit at low temperatures.

"triple glazing" are becoming more common due to higher energy costs. Insulated glazing may be framed in a sash, frame or in a curtain wall.

## Thermal Performance

The maximum insulating efficiency of a standard IGU is determined by the thickness of the space containing the gas. Typically, most sealed units using a gas space of between 5/8 to 3/4" (16-19 mm). When combined with the thickness of the glass panes being used, this can result in an overall thickness of the IGU of between 7/8 and 1" for 3 mm glass (22-25 mm) to 1 1/2" (28-31 mm) for 1/4" plate glass.

IGU thickness is a compromise between maximizing insulating value and the ability of the framing system used to carry the unit.



**Installation of Curtain Wall**

# LOW-E Glass --Solar-control to help you save energy!

It allows the sun's heat and light to pass through the glass into the building. At the same time it blocks heat from leaving the room, reducing heat loss considerably. It may reduce the emission of the glass from 0.84 to 0.1, the radiant heat waste may be reduced by 90%.



**Decoration Cross-bar**

The alternative is to replace air in the space with inert gases such as argon (argon has a thermal conductivity 67% that of air.)

Characteristics: The Low-E glass is able to reflect the far infrared heat energy, compared with the normal coated glass it allows the highly visible light to transmit, as well as a low outward reflection. If it is made to insulating glass, it can make an economy air condition expense in summer and saving the heating cost in winter, which results in an energy saving.

## LOW-E Performance Data

Color	Visible Light %			Solar Energy %			U-Value(W/m <sup>2</sup> K)		Shading Coeff.
	Reflectance		Trans.	Reflec.	Trans.	Absorp.	Winter	Summer	
	out	in							
Clear	10.9	11.5	72.5	19.5	47.6	32.9	1.766	1.748	0.643
Aqua	60.0	9.0	12.0	28.0	8.0	64.0	1.790	1.780	0.410
Blue-grey	24.5	18.0	60.7	35.2	32.5	32.3	1.707	1.670	0.460
Blue	20.6	16.0	62.0	30.6	37.5	31.9	1.712	1.676	0.501
Sky-blue	16.0	12.0	62.0	38.0	28.0	34.0	1.770	1.760	0.500
Blue-green	19.0	13.0	41.5	12.0	19.0	69.0	1.790	1.780	0.300
Silver-blue	31.0	15.0	43.6	37.5	20.3	42.2	1.726	1.696	0.310
Grey	17.2	15.9	47.2	25.6	23.6	51.1	1.707	1.670	0.368
Silver-grey	34.0	15.0	32.0	40.0	15.0	45.0	1.600	1.520	0.239





# Fire-rated/Fireproof Glass



Glass heated to 878.6 °C

Fire-rated glass can help keep flames and smoke from spreading from one room to another. It means that glass can play a vital role in restricting fire damage to a limited area.

## 1) Single piece/monolithic fire resistant glass

It is type-C fire resistant glass of the fire-resistant integrity, which is characterized with high glass strength, good fireproof integrity, good smoke proof and weather resistance and so on. Specially, it's mainly used in the

buildings. In the room it can prevent fire from spreading outward and outdoor fire spreading inward. Thickness is 5mm, 6mm, 8mm, 10mm, and 12mm etc.

## 2) Grouting complex fire resistant glass

With the characteristics of heat-insulating type A fire resistant glass is highly transparent as well as fire-resistant and heat-insulating. Its thickness is 15mm, 18mm, 19mm, 20mm, 23mm, 25mm, 26mm, 32mm, 36mm and so on.



Type	Thickness (mm)	Fire-resistant & heat-insulating limit	Weight (per m <sup>2</sup> )	Elevating temp. of the fire surface	Fire back surface max. average temp.
EI120	32 ±2.0	>=120 mins	52kgs	1113 °C	<=129 °C
EI 60	26 ±1.5	>=60 mins	45kgs	925.3 °C	<=60.5 °C
EI 30	19 ±1.3	>=30 mins	35kgs	826.7 °C	<=74.6 °C

## Test of large size EI 120 Glass -in Japan



The gel can work in extreme weather condition from -40°C to +60°C

**EI 60minutes Glass**

5mm glass+6mm Gel+5mm glass+6mm gel+5mm glass

Complex insulating glasses are now available that stop flame, smoke and heat transfer. They are wireless safety glasses and are being specified more and more as glass becomes an integral part of the fabric of a building, not just in windows and doors.





# Bulletproof Glass

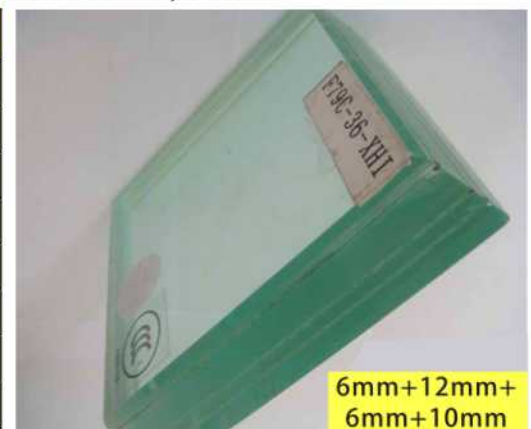
Bulletproof glass is particularly resistant to being penetrated when struck by bullets. Since manufacturing glass of usable thicknesses capable of fully stopping most bullets cannot currently be done, the industry generally refers to it as bullet-resistant glass instead.

Bullet-resistant glass is usually constructed using a strong but transparent material such as polycarbonate thermoplastic or by using layers of laminated glass. The desired result is a material with an appearance and light-transmitting behavior of standard glass but offers varying degrees of protection from small arms fire.



## RECOMENDEND COMPOSITIONS FOR BULLET RESISTANT (BULLET PROOF) GLASS

CLASS TEST "S"	WEAPON & AMMUNITION	SOLIVER CODE	TOTAL THICKNESS
BR 1	Carbine 0,22 LR	3340	14 mm
BR 2	Pistol 9 mm Luger	3495	22,5 mm
BR 3	Pistol 0,357 Magnum	3360	22,2 mm
BR 4	Pistol 0,44 REM	3625	34,5 mm
BR 5	Rifle 5,56 x 45	3646	38,6 mm
BR 6	Rifle 7,62 x 51	3600	60 mm
SG 1	Riot gun CAL. 12/70 Brenneke	3625	34,5 mm
SG 2	Riot gun CAL. 12/70 Brenneke	3627	36,3 mm
	Kalashnikov AK 47 Mild steel core 7,62 x 39	3627	36,3 mm



## U glass (Channel Glass) PROFILIT

U-profile glass is an new and unique kind of construction glass, enjoying over 40 years history of production and applications. Thanks to its U shaped section, its mechanical strength is higher than ordinary plating glass. It has much advantages such as ideal light transmission, good sound insulation, excellent heat insulation, reservation and convenient installation. This product is the first-choice construction material for interior walls, exterior walls, partitions, roofs and windows etc. Using U-profile glass, a

lot of metal materials can be saved.



Specifications  
Thickness: 6 -7mm patterned, unwired  
Section Size:  
260x41x6mm, 260x60x7mm  
Colors: clear, bronze, blue or affixing color film as customer's require.

Applications:  
interior walls, exterior walls, partitions,  
roofs and windows etc.



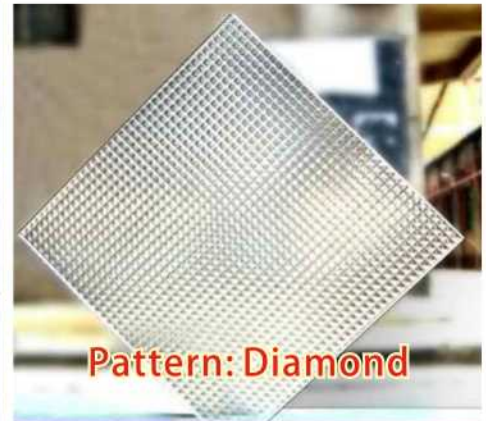


# Pattern Glass/Figure Glass

Pattern glass is produced by coating and rolling clear or body-tinted, translucent clear, flat glass. The glass is heated to its softening point and passed between two rollers, which emboss the pattern into the glass. It not only provides function of visual screen but also creates aesthetic beautiful senses of changing lights and shades.

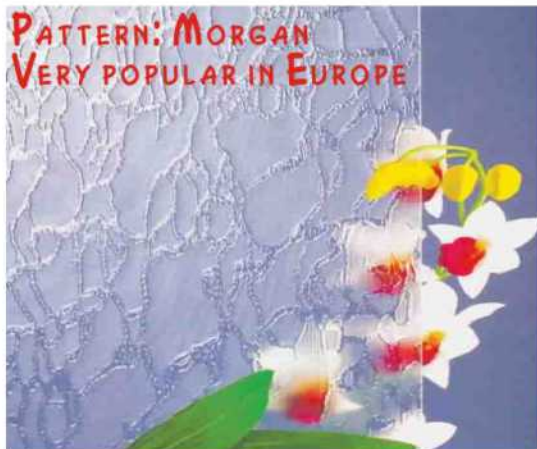
## Product Characteristics:

1. Distinguished lighting effect (for example, the patterns of the glass include Nashiji, Flora, Waves, Diamonds, Millennium, etc.)
2. Special transparency effect-- The pattern glass can distill comfortable volumes of light and create a delicate obscurity effect.



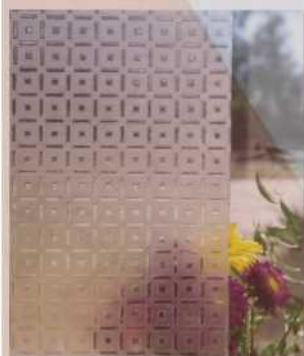
## Applications:

Offices, buildings, hospitals, sports grounds, body-building rooms, bathrooms, washrooms, etc.



# Satin/Frosted/Enameled/Sandblast Glass

Acid-etched glass has a distinctive, uniformly smooth and satin-like appearance. Acid-etched glass admits light while providing softening and vision control. Sandblast glass is made by spraying sand at high velocities over the surface of the glass. This gives the glass a translucent surface, which is usually rougher than that obtained by etching. During sandblasting, only the areas that are to remain transparent are masked for protection. The depth and degree of the translucency of the sand-blasted finishing vary with the force and type of sand used.





## Low Iron Float Glass (Extra Clear Glass)

We are supplying two kinds of ultra-clear glass, one is called solar ultra-clear glass and another is optic ultra-clear glass. The solar ultra-clear emphasizes particularly on high solar light transmission. Such glass are widely used in greenhouse, soloar collector. . . The optic ultra-clear is

The glass mainly are applied in top grade buildings, furnitures, decorated glass, screen printed. . . Our ultra-clear is available in thicknesses ranging from 3 mm to 19 mm and sizes up to 3660\*2250mm. Both of the ultra-clear glass can be fabricated, tempered, and laminated like regular float glass, giving it a broad range of decorative and functional applications.



COMPARISONS IN LIGHT TRANSMISSION:

Thickness	Clear float galss	Ultra-clear glass
3mm	89%	91.40%
4 mm	88%	91.20%
5 mm	87%	90.85%
6 mm	85%	90.50%
8 mm	83%	90.45%
10 mm	82%	90.30%
12 mm	79%	90.20%
15 mm	77%	89.90%
19 mm	73%	89.60%

## Low Iron Pattern Glass for Solar Panels

The main technique for the production of solar cell sealed glass is Rolling Process. The patterned roller is specially made for solar glass, which the specail pyramid pattern is pressed on the downward surface and the special matt pattern is pressed on the upware surface on the ultra white glass. The special patterns are designed to reduce the direction reflectance and to increase the internal reflection effect that the solar energy can be absorbed effectively. The maximum transmittance of the solar lights and the efficiency of electricity generation are also raised.

Solar transmittance: (3.2mm polisse)>=92.2%

IRON CONTENT: <=120ppm Fe2O3

Poisson's ration: 0.2

Density: 2.5g/cc

Young's Modulus: 73GPA

Tensile strength: 50MPa

Resistance curving strength: 80mpa

Expansion coefficient: 8.5x10-16/degree C

Softening point: 717 degree C

Annealing point: 550 degree C

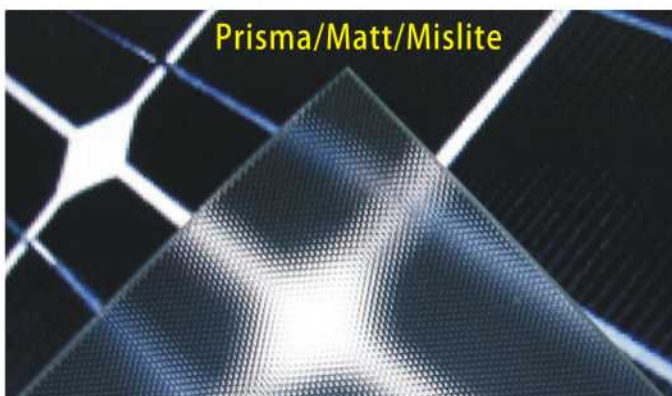
Pattern: mistlite, prismatic, matt/matt.

Max. width: 2200mm.

Thickness: 2.5 -6.0mm, standard thickness 3.2mm.



Roof Solar Collector







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