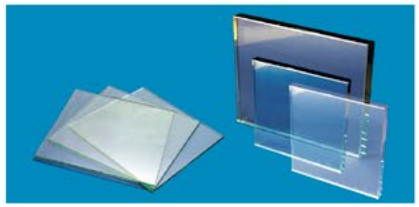
## Features



High transmittance of visible light - the transmittance is the highest among domestic products of the same category.

Outstanding evenness and uniformity - small deformation after re-processing, low distortion of reflected image.

High precision control - on-line digital scanner can detect defects larger than 0.1 mm.

## Specifications

Standard thickness(mm): 2.0, 2.1, 2.3, 2.5, 3.0, 3.2, 4.0, 5.0, 6.0, 8.0, 10, 12, 15, 19, 22

Standard dimension(mm): 914 x 1220, 1160 x 1600, 1500 x 2000, 1545 x 2440, 1650 x 2140, 2140 x 3300, 2140 x 3660, 2440 x 3050, 3660 x 4200, 3300 x 6000, 3300 x 10000, 2400 x 3300, 2440 x 3660, 2800 x 3660

The other thicknesses and sizes may be available upon request.

## Quality

Conforming to ASTMC1036-5, the American standard

Conforming to BS952, the British standard

Conforming to AS2208, the Australian standard

Conforming to JISR3202, the Japanese standard

Conforming to GB11614, the Chinese standard



# Infrared Screening Glass

About half of the energy consumption of buildings comes from windows. Improving energy efficiency of window glass contributes a lot in reduction of electrical bill. Application of high performance energy efficient glass plays a key role in green building development and energy saving for the society. As the leading energy efficient glass manufacturer in China, CSG Holding Co., Ltd. (CSG) developed a brand new series of glass products, namely infrared screening glass, with the latest coating technology, outstanding performance and a range of amazing colors, providing architects with exceptional options to meet the developing trend of architectures. The remarkable energy efficient infrared screening glass has the following specials:

Direct solar infrared transmittance below 2%, extraordinarily cool in summer
Emissivity approaching zero, about 0.02, low thermal transmittance;
Higher visible light transmittance, better daylight.
The best energy efficient glass for the Middle East.

## Advantages of Infrared Screening Glass

In the solar radiation, about 47% is visible light and 51% is infrared radiation (IR). The incoming solar IR through window glass causes heat accumulation and temperature rise, which is the major heat source of cooling load.

### Comparison of different glass products with the same visible light transmittance

Transmission spectra with the same Tv

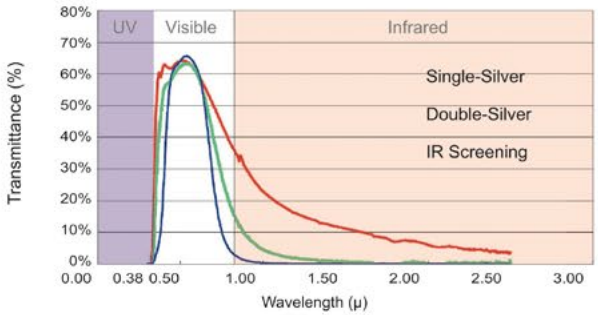



Figure 1

The figure 1 shows transmission spectra of single silver low-e, double silver low-e and infrared screening glass with the same visible light transmittance. Within the infrared region (780nm - 2500nm), the area under the transmission curve reflects direct solar IR transmittance. The overall transmittance in the solar IR region is the sum of direct solar IR transmittance plus secondary transfer, defined as total solar IR transmittance ($S_{IR}$)which quantitatively describes glass characteristics against solar IR. Much better than single and double silver low-e glass as shown, all infrared screening glass products of CSG have a direct solar IR transmittance below 2%, and a total solar IR transmittance around 3%, which indicates an extraordinary performance in reducing cooling load and creating comfortable working and living environment in hot seasons.

## Comparison of different glass products with the same shading coefficient

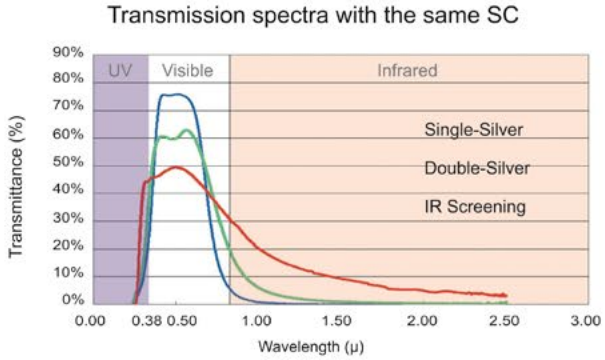



Figure 2

Shading coefficient (SC) is determined by integration over the whole solar spectra from 300nm to 2500nm, which is often used to evaluate glass performance against solar heat in design practice and building codes. As a matter of fact, visible light acts differently from solar infrared radiation in energy efficiency of buildings. The figure 2 shows a comparison of different glass products with the same SC. Obviously, infrared screening glass has the lowest solar IR transmittance and in return the best performance against solar IR and in reduction of cooling load. In view of all infrared screening glass products having a direct solar IR transmittance below 2%, they should be better selected following visible light transmittance and aesthetic appearance requirements rather than shading coefficient SC to optimize energy efficiency of buildings.

## Various options

The infrared screening glass products have a wide range of visible light transmittance (from around 45% to 70%), different brightness (reflectivity from about 10% to 30%), and various colors (neutral, light grey, silver grey, silver, light blue, blue grey etc.). Exhibiting crystal clear look of satisfied colors at different viewing angles, the infrared screening glass products are incredible combinations of best performance and outstanding aesthetic effect, providing architects with idea options for various design concepts.



## Performance Data(Triple Silver Low-E)

| Coating | Glass Makeup | Appearance | Visible Light(%) | | | Solar Energy(%) | | | U-value(W/m2·K) | | Shading Coefficient | SHGC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trans | Refl | | Trans | Refl | | Winter night | Summer day | | |
| | | | | Out | In | | Out | In | | | | |
| SJ65S | 6C (SJ65S)#2+12A+6C | Light grey | 62 | 12 | 13 | 24 | 38 | 46 | 1.65 | 1.58 | 0.32 | 0.28 |
| SJ52S | 6C (SJ52S)#2+12A+6C | Grey | 50 | 15 | 11 | 20 | 37 | 42 | 1.67 | 1.61 | 0.28 | 0.24 |
| SJ50S | 6C (SJ50S)#2+12A+6C | Grey | 50 | 9 | 15 | 22 | 35 | 38 | 1.69 | 1.64 | 0.30 | 0.26 |
| SJ35S | 6C (SJ35S)#2+12A+6C | Grey | 35 | 14 | 12 | 14 | 35 | 45 | 1.70 | 1.65 | 0.22 | 0.20 |
| LB61S | 6C (LB61S)#2+12A+6C | Bluish grey | 58 | 16 | 15 | 24 | 36 | 44 | 1.67 | 1.61 | 0.32 | 0.28 |
| LB49S | 6C (LB49S)#2+12A+6C | Bluish grey | 47 | 9 | 17 | 20 | 34 | 38 | 1.67 | 1.61 | 0.28 | 0.24 |
| BJ52S | 6C (BJ52S)#2+12A+6C | Silver grey | 52 | 20 | 16 | 21 | 39 | 44 | 1.65 | 1.58 | 0.30 | 0.26 |

Remarks:
1. The data is provided for your reference.
2. The glass performance is estimated with the OPTICS， which would be different with the test results.
3. Note: A—Air space; C—Clear Glass.

Street no. 60, jing an district, Shanghai
quantity： 38000 ㎡
Glass Makeup：
Triple Silver Low-E laminated insulating glass

Market Street， Singapore
Quantity： 20000 ㎡
Glass Makeup：
Triple Silver Low-E laminated insulating glass

# Double Silver Low-E Glass

While maintaining the same visible light transmittance, double silver Low-E glass has much lower total solar IR transmittance, $S_{IR}$, than single silver Low-E glass. In other words, double silver Low-E glass filters the sunshine as a cool lighting source to a larger extent and provides a better solution to energy efficiency of buildings, especially in hot climate zones.

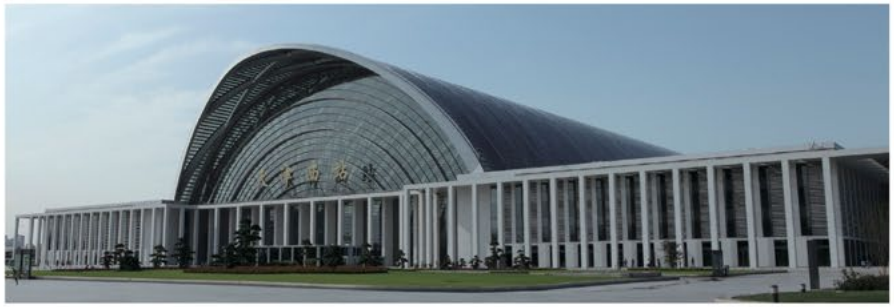
## Features

A wide range of visible light transmittance - meet various daylight requirements;
A variety of crisp colors - sound options for different aesthetic effects;
Low total solar IR transmittance, $S_{IR}$ - more comfortable and effectively reducing cooling load.

## Performance Data(Double Silver Low-E)

| Coating | Glass Makeup | Appearance | Visible Light(%) | | | Solar Energy(%) | | | U-value(W/m2·K) | | Shading Coefficient | SHGC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trans | Refl | | Trans | Refl | | Winter night | Summer day | | |
| | | | | Out | In | | Out | In | | | | |
| SJ79 | 6C (SJ79)#2+12A+6C | Neutral | 70 | 11 | 12 | 38 | 27 | 33 | 1.69 | 1.64 | 0.50 | 0.43 |
| SJ66 | 6C (SJ66)#2+12A+6C | Neutral | 62 | 12 | 12 | 31 | 32 | 37 | 1.68 | 1.62 | 0.42 | 0.36 |
| SJ60 | 6C (SJ60)#2+12A+6C | Light grey | 54 | 15 | 12 | 25 | 35 | 40 | 1.67 | 1.61 | 0.35 | 0.30 |
| SJ55 | 6C (SJ55)#2+12A+6C | Grey | 47 | 12 | 12 | 24 | 28 | 32 | 1.72 | 1.67 | 0.35 | 0.31 |
| SJ48 | 6C (SJ48)#2+12A+6C | Grey | 43 | 16 | 13 | 20 | 33 | 36 | 1.71 | 1.66 | 0.30 | 0.26 |
| SJ42 | 6C (SJ42)#2+12A+6C | Grey | 42 | 8 | 12 | 19 | 22 | 36 | 1.69 | 1.63 | 0.3 | 0.26 |
| LB63 | 6C (LB63)#2+12A+6C | Bluish grey | 57 | 21 | 16 | 25 | 43 | 43 | 1.69 | 1.63 | 0.34 | 0.3 |
| LB60 | 6C (LB60)#2+12A+6C | Bluish grey | 54 | 16 | 12 | 24 | 39 | 41 | 1.67 | 1.61 | 0.34 | 0.30 |
| LB51 | 6C (LB51)#2+12A+6C | Silver grey | 46 | 27 | 16 | 20 | 44 | 44 | 1.67 | 1.61 | 0.28 | 0.25 |
| LB45 | 6C (LB45)#2+12A+6C | Blue | 40 | 19 | 13 | 18 | 38 | 37 | 1.69 | 1.63 | 0.26 | 0.23 |

Remarks:
1. The data is provided for your reference.
2. The glass performance is estimated with the OPTICS, which would be different with the test results.
3. Note: A–Air space; C–Clear Glass.





# Single Silver Low-E Glass

Within the coating structure of single silver Low-E glass, there is one silver layer. Single Silver Low-E glass has been widely used in various buildings at different locations worldwide.

## Features

Visible light transmittance - adequate indoor natural daylighting.
Solar energy transmittance - a wide range of shading coefficient SC available, for different geological locations.
High far infrared reflectance - low U-value, reduced thermal transfer due to temperature difference.

## Performance Data(Single Silver Low-E)

| Coating | Glass Makeup | Appearance | Visible Light(%) | | | Solar Energy(%) | | | U-value(W/m2·K) | | Shading Coefficient | SHGC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trans | Refl | | Trans | Refl | | Winter night | Summer day | | |
| | | | | Out | In | | Out | In | | | | |
| CES11-80N | 6C (CES11-80N)#2+12A+6C | Neutral | 72 | 12 | 13 | 50 | 18 | 22 | 1.90 | 1.91 | 0.65 | 0.57 |
| CEF13-46 | 6C (CEF13-46)#2+12A+6C | Bluish grey | 43 | 20 | 15 | 25 | 27 | 34 | 1.77 | 1.74 | 0.37 | 0.32 |
| CEB13-60 | 6C (CEB13-60)#2+12A+6C | Bluish grey | 52 | 21 | 12 | 34 | 26 | 25 | 1.84 | 1.83 | 0.46 | 0.4 |
| CEF16-50 | 6C (CEF16-50)#2+12A+6C | Silver grey | 46 | 30 | 15 | 28 | 32 | 31 | 1.77 | 1.74 | 0.39 | 0.34 |
| CEB12-45 | 6C (CEB12-45)#2+12A+6C | Grey | 44 | 15 | 13 | 27 | 22 | 29 | 1.79 | 1.77 | 0.39 | 0.34 |
| CEY14-60 | 6C (CEY14-60)#2+12A+6C | Blue | 55 | 19 | 11 | 35 | 26 | 28 | 1.79 | 1.77 | 0.48 | 0.42 |

Remarks:
1. The data is provided for your reference.
2. The glass performance is estimated with the OPTICS, which would be different with the test results.
3. Note: A–Air space; C–Clear Glass.

Magnetron Sputtering Coating Line with 50 cathodes