



BULLET RESISTANT GLASS

PRODUCT RANGE & STANDARD SIZES

Category	Thickness	Glass make-up	Rating
		(with 0.38 interlayers)	
GA	28mm	4+10+10+3*	9mm Parabellum
GB	38mm	4+10+10+10+3*	357 Magnum
GC	53mm	4+12+12+10+10+3*	44 Magnum
RA	53mm	4+12+12+10+10+3*	R4 Rifle
RB	78mm	(6 x 12)+3*	R1 Rifle

TERMS AND DEFINITIONS

Visible Light

This is made up of all colours of the rainbow, it is the light humans can see. It is also known as “white light”.

Visible Light Transmission

The percentage of visible light transmitted through the glass when the sun shines at right angles to the surface of the glass. Higher visible light transmission makes a building look more transparent from the outside and creates a lighter interior.

Visible Light Reflection

The percentage of visible light reflected from the surface of the glass, when the sun shines at right angles to the surface of the glass. The reflection increases as the angle of the sun decreases.

Solar Energy

Solar energy is high temperature energy radiated by the sun. It is the energy received from the sun on the surface of the earth. This includes the energy from the ultraviolet, visible and infrared segments of the solar spectrum.

- **Solar Heat Elimination**

The portion of the sun’s energy stopped by the glass or glazing system. This value will change when subjected to varying environmental conditions. The environmental conditions, which affect solar heat elimination, include air speed against both surfaces of the glass and temperature.

- **Solar Energy Control**

A solar control glazing system **Reflects, Absorbs and Transmits (RAT)** solar energy. Laminated glass contains an interlayer. Energy that would pass through clear glass is absorbed by this interlayer. A variety of interlayer colours are available to absorb solar radiation – the darker the colour, the greater the solar control. The increased use of glass in architecture today makes it imperative to consider the comfort of a building’s occupants and energy efficiency.

Example:

Grey Solarvue XHL RAT

Reflectance 9

Absorption 63

Direct Transmission 28

100 (RAT always = 100)

- **Reflectance**
The parts of the sun's energy which is reflected by the glass.
- **Absorption**
The part of the sun's energy which is absorbed into the glass.
- **Direct Transmission**
The part of the sun's energy which passes directly through the glass.
- **Total Energy Transmission**
The sum of the direct energy transmission and the portion of the absorbed energy that is radiated to the interior of the glazing system. Also called Solar Heat Gain Coefficient (SHGC).

Shading Coefficient

Shading Coefficient is a measure of the total amount of heat passing through the glazing system (known as the solar heat transmittance) compared to a single clear glass. Clear Float Glass (CFG) has a shading coefficient of 1. Therefore, a shading coefficient of 0.50 represents a reduction of 50% of the heat that would have been transmitted when compared to a single sheet of CFG. In other words the lower the shading coefficient, the less solar heat is allowed into the building.

How to calculate?

SC = Total Energy Transmission (TET) of the glass (87 is the total energy transmission for CFG)

U-factor (U-value)

The lower the better!! The U-factor measures how well a product prevents the conductance/transfer of heat or cold through building material. A lower U-factor means a better insulated window or door.

Ultraviolet Light (UV)

Ultraviolet rays are found in everyday sunlight and can cause fading of paint finishes, carpets and fabrics.

Thermal Insulation

The ability to restrict the flow of heat.

Coated Glass

Glass with a chemical coating applied to one surface of the glass. The coating can provide such enhanced performance characteristics such as privacy, solar control or mirror effects.

Coated Interlayer

Interlayer made from multiple stacks of coating also known as sputter soft coated products. The coating is encapsulated inside the interlayer.

Coated Densities

The thicker the coating, the less light is transmitted through the glass.

- High Light (HL) - 40%
- Extra High Light (XHL) - 50%
- Super High Light (SHL) - 60%
- Mega High Light (MHL) - 70%
- Ultra High Light (UHL) - 80%

Annealed Glass

To prevent or remove stresses in glass by controlled cooling. It is in fact “ordinary” glass as taken from the production line and stored in stock plates. Annealed glass, when broken, gives large fragments with sharp edges and so is not classified as a safety glass.