PRODUCT BRIEFING - VIRIDIAN ENERGYTECH™

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What is it?
Viridian **EnergyTech™** is a clear glass that has a special coating on one surface of the glass. It is the coating which provides the "Low E" property of the glass. "Low E" refers to Low Emissivity and describes the capacity of a surface to radiate heat. Emissivity is measured across a scale from 0 to 1 with 1 representing the highest emissivity.

How does it work?
The low emissivity coating is spectrally selective which means that it affects some wavelengths of radiation but not others. In the context of this article, radiation is made up of Ultraviolet, Visible, Short Wave Infrared and Long Wave Infrared radiation. This spectral selectiveness can be a very useful property.

The energy from the sun is called Short Wave Infra-red whereas Long Wave Infra-red is the area of the wave band that represents the heat generated by our bodies, room heaters and the furnishings in a warm room, etc. A low emissivity coating has a high transmission of Short Wave Infrared energy. However, it also offers a high reflection of Long Wave Infrared energy which greatly reduces the amount of this heat from otherwise escaping through the glass on a cold night. Instead, it keeps the room warmer and reduces the amount of heat required to be generated by the heater, which in turn, reduces energy consumption.

How do you use it?
Viridian **EnergyTech™** can be used in single glazed applications or as part of an Insulating Glass Unit (IGU):

Single glazing
- Solar Control

The low emissive property of the glass can also be used quite effectively for solar control. One of the ways some of the heat from the sun can enter a room is for the heat absorbed by the glass to be re-radiated into the room. If the low emissivity coating is facing the room, then it will restrict the re-radiation and therefore boost the solar control. To achieve this Viridian **EnergyTech™** must be laminated to a solar control product. The lower radiation also improves comfort when in close proximity to the glass.

- Insulation

The high Long Wave reflection of Viridian **EnergyTech™** can be used to reflect a high proportion of the heat, which would normally escape through a window, back into the room. This provides insulation (called the U-Value) that is much closer to that of insulating glass units than single glazing. The lower the U-Value, the greater the insulation performance.

Insulating glazing
- Solar Control

The absorbed heat re-radiated by a solar control glass is Long Wave infrared so will be reflected away by the low emissivity coating. Viridian **EnergyTech™** can therefore be glazed as the inside glass of an IGU with the coating on surface 3. This will reflect a high proportion of the re-radiated heat back into the solar control glass. This further reduces the amount of heat entering the room and provides an improvement in the Solar Heat Gain Coefficient.

- Insulation

In general, Viridian **EnergyTech™** is used as the inside glass of an IGU with the coating on surface 3. This permits the use of an independent solar control glass to be used as the outside glass. Heat from the room passes to the inside glass and the coating on surface 3 reduces the re-radiation of this heat into the air gap; and so most of the heat radiates back into the room. This provides an improvement on the insulating capacity of an IGU which is represented by the U Value. This effect keeps the inside glass of the IGU warmer than in a standard IGU which further reduces the chance of condensation on the glass inside the building.

Insulation Performance – U Value (W/m2ºC)

	VFloat™	EnergyTech™
Single glass	5.8	3.6
6mm Air	3.01	2.51
6mm Argon	2.83	2.09
12mm Air	2.67	1.88
12mm Argon	2.52	1.62

Using 6mm glass thicknesses

Typical measured values of Viridian production are provided.
All performance data is calculated using LBL window 5.2 software, NFRC 100-2001 conditions have been used.
Performance data is centre of glass values.

Coating characteristics when single glazed
The performance of Viridian **EnergyTech™** is achieved by high reflection and low emission of Long Wave Infrared radiation. When used in single glazed situations the coating can be exposed to the collection of dust. The glass is normally installed vertically so the build up of dust is very slow. If the coating were to be completely covered with dust then the reflection and emission control would be compromised. However, in normal situations, the glass would be cleaned long before it became this dirty, so the effect on performance from the presence of dust is minimal.

The presence of condensation on the coating will significantly reduce the performance, so it is important not to use low emissivity glass where condensation is expected to be common. An example would be alpine locations, where insulated glazing would provide a better solution.

Convection is accelerated air movement over a surface causing increased energy exchange between the air and the surface when compared to the energy exchange between still air and the surface. As the speed of the air is increased, the rate of energy exchange also increases. The coated and uncoated surfaces of Viridian **EnergyTech™** would be affected by a convection current in much the same way. Directing heating or cooling ducts onto the glass is an example of a convection current and will reduce the performance of the glass. This is because it will increase the energy gained or lost by conduction. If ducts are not directed at the glass and air movement in the room is at a level that cannot be detected by the occupants, then the effect on performance is minimal.

Summary
Viridian **EnergyTech™** can be used effectively as single glazing to provide insulation and solar control when laminated to a high performance tinted glass. It can also be used within an IGU to provide effective solar control and improve comfort when in close proximity to the glass through increased insulation.

Further information
Please visit viridianglass.com or freecall 1800 810 403

Viridian New World Glass

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