



With the smart windows market expected to grow to around \$760 billion by 2020 according to n-tech Research, we focus on two innovative technologies (GIPV and thermochromics) that look promising with glass. We then shed some light on the different techniques used in glass printing to facilitate the decision process on your next project!

# Innovative Technologies

with Glass

GIPV with glass

[What is GIPV?](#)

It has evolved greatly since its inception. In the past, it meant little more than adding GIPV panels after the building has been completed.

**Now, these panes of glass are installed directly onto buildings during construction as an alternative building material to conventional glass.**



#### How does it work?

The embedded solar modules are connected to form module strings and the module strings are connected to the junction box. GIPV then generates clean energy from the sun in two steps: first, it converts sunlight into direct current in the junction box. Then, the direct current travels to the inverter where it is changed into alternating current that can be used immediately or stored.

It can be installed horizontally or vertically, with either a mono-facial or bi-facial configuration. A mono-facial configuration means the module generates electricity only from one side of the solar cell, whereas a bi-facial configuration means that the module generates electricity from the front and back sides of the solar cell.

#### Benefits of GIPV

Not only does it generate clean energy from the sun which leads to cost savings, it also serves as a daylighting tool that fills the gap for the increasing demand of environmentally-friendly building materials. The number of, and distance between the solar cells can be adjusted, leading to a customizable amount of light entry based on user's requirements.



#### Use it with:

- Skylights
- Windows
- Curtain walls
- Roofs

### Why this glass?

- Lesser heat gain -> Lower costs in air-conditioning
- Clean energy generated -> Save on electricity bills
- To achieve greener, net-zero energy buildings
- Higher ROI
- Adds value to Green Mark application

[Enquire about our GIPV glass](#)

## Thermochromics with glass

### What is thermochromics?

**Thermochromics are compounds sensitive to temperature that temporarily changes colour when exposed to heat.**

It turns back to its original colour when the temperature drops. To break the term down further, heat (*thermo*) is used to cause a “change in tint” (*chromic*). A thermochromic film is placed between two sheets of glass when used as a building material.

### How does it work?

When not receiving heat from direct sunlight, the window will be in its natural, slightly tinted state. When receiving heat from direct sunlight, the glass darkens intuitively, depending on the sunlight’s angle and intensity.

It does not require any additional equipment as it is completely self-activated by sunlight.

### Benefits of thermochromics

Reduced transmission of sunlight reduces glare, heat, and ultraviolet rays, which lessens air-conditioning load and results in cost savings. It also eliminates the need for blinds, shades or curtains, as it regulates the amount of light entry into a building.

Uneven exposure to the sun is also addressed adequately as it allows **approximately 50%** of light transmission into buildings when there is weaker sunlight, but **approximately 10%** of light transmission into buildings when there is stronger sunlight.

This ensures that the light transmitted into your building remains at a consistent intensity all day!



Morning



Afternoon



Evening

Use it with:

- Skylights
- Façades
- Windows
- Canopies

Why this glass?

- Anti-glare (interior of building)
- 30% more reduction of heat transfer than all Low Emissivity glass
- Adds value to Green Mark application
- More comfort and better environment for users of the building to live, work, and play

[Translate](#) ▼



[Enquire about our VariShield](#)

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## Different Techniques Used in Glass Printing

### How does one print on glass?

We explore two techniques used to print images and patterns on glass today, namely screen printing on glass and digital printing on glass. We shed some light on their differences as they are easily confused with one another.

Screen printing uses ceramic ink to deposit mineral pigments on one side of the glass using a pre-made stencil. The ceramic frit paint is then fused permanently onto the surface during the heat strengthening process, providing exceptional durability and colour stability to the final product.

Digital printing uses print heads to jet ceramic ink directly onto the glass. The printing of complex images of all sizes are easily achievable as the files are stored digitally. The ceramic frit paint is then fused permanently onto the surface during the heat strengthening process, providing exceptional durability and colour stability to the final product.



Here's an easy comparison chart for future projects you may have:

	Screen printing on glass (DuraScreen)	Digital printing on glass (DuraScreen-DigitalPrint)
Images on the glass	Basic patterns and graphics	Complex patterns, graphics and photographs
Colours	Limited colours	Multiple colours
Customization	Limited customization	Highly customizable

[Enquire about DuraScreen](#)

We hope this newsletter has brought you some insights on the evolving trends of architectural glass. Do remember that we're always here to help with your requirements. Till next time!

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