

# METRO

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For several decades, architects and builders around the world have explored ways and means to design the 'nearly-Zero Energy' building. Today, enabled by modern technology and innovative building materials, that dream is a reality. Across residential and commercial buildings, builders are offering customers the opportunity to explore a more eco-friendly way of life; a life that's smart, efficient and above all, sustainable.

In recent times, the idea of green buildings has gained momentum. Builders, developers and architects are increasingly looking to make use of green materials like glass to add a new dimension to their buildings. Awareness of environmental impact of increased construction activity

has recently been on the agenda of Governmental entities and Environment Ministry. It is widely expected that building code changes are in pipeline in order to adhere to these concerns. Construction houses are striving to obtain sustainability certifications, to ensure a better quality of life for residents and help conserve the environment.

2001	Present
1 green building	516 green buildings
0 sq.ft. area classified green	330 Million sq.ft. area classified green
No energy saving	40-50% energy saving

0 accredited professionals	100 accredited professionals
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In little more than a decade, India has emerged as one of the leading countries in the adoption of Green Building norms.

### Building Green with Glass

The extensive use of innovative glass products in today's buildings has helped reduce the need for artificial lighting and thereby minimised energy consumption. Green buildings admittedly cost more to build but the operational cost is substantially reduced. This makes the cost of ownership of a green building substantially less than conventional spaces. Various types of glazing solutions – both internal as well as external – have not only



made our spaces more efficient but also unlocked new possibilities in design and aesthetics.

**Glass – a versatile, aesthetic and green building material; here is why :**

- Natural day-lighting
- Recyclable, non-toxic and green material
- Improves energy efficiency

- Enables innovative designs
- Superior sound insulation
- Better thermal control
- Prevents accumulation of dust and dirt
- Lowers maintenance costs

**Parameters of glass that make it an effective green building material :**

- Solar Factor / Solar Heat Gain Coefficient (SHGC)
- U-Value
- Relative Heat Gain
- Visual Comfort
- Safety
- Sound Insulation

Green Solutions from Asahi India Glass Limited



As India's leading integrated glass company, AIS has been at the forefront moving towards an eco-friendly future. It has pioneered innovations in glass processing technology to develop products that feature the best 'green' parameters. **AIS manufactures both single-glazed and double-glazed products allowing architects greater choice and the ability to explore newer possibilities. These solutions enhance the aesthetics and efficiency of commercial and residential spaces, that provides the builders with viable, attractive and economical alternative to traditional building materials.**

Providing you with 360° degree solutions, starting with expert and customised guidance for product selection and purchase, site assessment and consultation, installation, project management, and post-installation

support.

We aim to provide a hassle-free experience during the process of decision making, delivery and installation of glass and allied products and services with world class quality control at each stage of the value chain, having a trained set of skilled technicians. All this to ensure a Best-in-Glass Experience for you.

So go ahead and dream big - Glasxperts is here to deliver you a world-class glass experience.

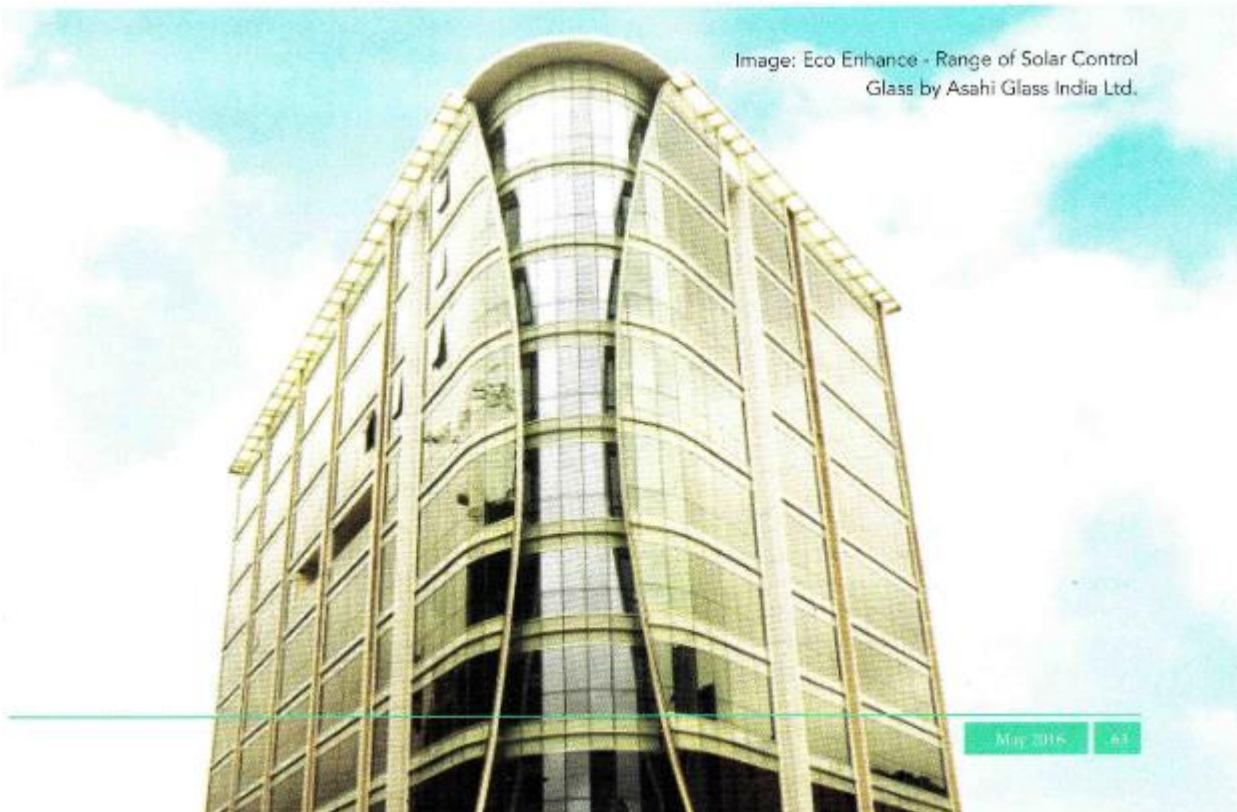
### Ecosense the Energy Efficient Glass

Energy Efficient Glass ranges from AIS, under the brand name of "Ecosense" provides the benefit reducing the heat gain in buildings due to its **excellent energy saving properties without compromising on the natural light**

**coming inside the building or the brilliant aesthetics that add value to the façade. And in winter, they ensure solar gain.** So that no matter what the season, people inside stay comfortable at all times. Using energy-efficient glass also helps in ensuring that the interiors – and the occupants of the home – feel more comfortable.

Ecosense comes in three ranges – Enhance (Solar Control), Exceed (Solar Control Low-E) and Essence (Low-E) high performance Glasses. Ideal for solar and thermal insulating parameters, Ecosense combines aesthetics with environmental sensibility and conforms to all International and National Green Standards, making it the natural choice as a Green Building solution. Ecosense performance parameters like Visual Light Transmission, Solar Factor, U-Value and Internal Reflection make buildings more efficient and ecologically viable.

Image: Eco Enhance - Range of Solar Control Glass by Asahi Glass India Ltd.



## Smart Glazing – The Future of Glass



As one of the most versatile and exquisite building materials, glass offers excellent opportunities for making extraordinary creations in architecture and interior design. As enchanting as the nature and effect of glass is, its marriage with state-of-the-art technology is creating results that are as sophisticated as they are aesthetic. **Smart glazing – glass whose light transmission properties are altered by technology, so that it can interchange instantly between transparency, translucency, and opaqueness. Smart glass is used for windows, skylights, doors, and partitions, and is available as laminated panels or insulated glass units.**

### A Smart Investment towards a Smarter Future :

The demand for smart glass has been increasing for two reasons: modern lifestyle requirements of comfort, convenience, privacy, and energy efficiency; and being a different product in the highly competitive glass industry. Investment worth hundreds of millions of dollars has been made in smart-glass technology over the past few years by all bigwigs of the Industry.

Technologies for a Smart Future: A number of futuristic technologies, like electrochromic, thermochromic, suspended particle, and liquid particle, go into the making of smart glazing. Some of the technologies are mentioned below for techies!

### Electrochromic (EC) Technology

This is the most promising switchable glass technology today. A one-micron electrochromic thin film stack is deposited on a glass substrate. This stack is made up of ceramic metal oxide

coatings with three electrochromic layers sandwiched between two transparent electrical conductors. A voltage between the conductors sets up a distributed electrical field. This moves lithium or hydrogen ions reversibly between the ion storage film through electrolyte and into the electrochromic film.

As a result, the glazing switches between the clear state and the transparent blue-gray tinted state. There is no loss of visual clarity, as in photochromic eyeglasses. Power is needed only to change the glass from one state to the other.

Advantages	Disadvantages
Less energy consumption: Smart glass controls incoming light and solar heat gain, reducing the need for air-conditioning	Shorter lifespan than traditional glazing
Energy efficiency: It requires very low-voltage power (0–10 volts DC) to operate	Slow transition between clear and opaque state
Reduced costs: Control and modulation of incoming light and solar heat gain leads to lower energy bills and occupants' comfort.	
Privacy: When you need it and Better security: When darkened	
Convenience: Reduces the need for mechanised and automated blinds	

### Suspended Particle Device Technology

This technology enables manual and precise control of light and heat, compared to electrochromism. Rod-like nanoparticles are suspended in a liquid placed between two layers of glass or plastic. In the unpowered state, the randomly organised particles block light and the view. When voltage is applied, the particles align to allow light and to enable transparency. Varying the voltage of the film regulates the amount of light transmission and, hence, the tint of the glazing of the glass window or partition.

#### The Advantages :

- Less Energy Consumption: Precise heat and light control reduces need for air-conditioning and heating
- Reduced costs: Of installing and maintaining ACs and heaters, it also Eliminates the need for expensive window dressings
- Comfort & Convenience: With 99% UV blockage and state switching in 1-3 seconds

### Polymer Dispersed Liquid Crystal (PDLC) Device Technology

In LCD technology, electricity changes the shape of liquid crystals, allowing light to pass through them and forming colours, images, figures, and numbers on flat panel displays. Commonly used products, like portable computers, cellular phones, calculators, digital clocks and watches, are examples.

PDLC technology is a combined application of polymers and liquid crystals. In response to electricity, liquid crystal droplets align in parallel,

permitting light to pass and resulting in transparency. Without electrical charge, the droplets are randomly oriented and light is heavily scattered, resulting in opaqueness. Continuous power (between 24 and 100 volts AC) is required for the clear state.

#### The Advantage:

- Beats all other technologies in terms of switching speed and opacity
- The Disadvantage:
- Only two states (clear or opaque) can be achieved

#### Other Technologies

Micro-blinds are very tiny, rolled, thin metal blinds on glass. With no applied voltage, the micro-blinds are rolled up, letting light pass. With applied voltage, rolled micro-blinds stretch out and block light. Pros include switching speed in milliseconds, UV resistance, customisation, and cost-effectiveness. The technology is still under development.

Nanocrystals embedded in glass provide selective control over visible

and heat-producing, near-infrared (NIR) light. A small jolt of electricity switches the material between NIR-transmitting and NIR-blocking states. The window can also be switched to a dark mode, blocking both light and heat, or to a fully transparent mode.

### AIS Swytchglas: Switching on a New Trend

Manufactured using Suspended Particle technology, AIS Swytchglas is a revolutionary smart glass which gives the user flexibility between transparency and opaqueness, while enabling control of both heat and light. Ideal for a wide variety of applications at home or in the office, it presents the perfect balance between style and necessity. A smart solution from AIS for a smart you. Smart glazing solutions, with the advantages they offer, are enabling the creation of smart buildings that were unimaginable until a few years ago. And they are inspiring smart living – in a brave new world that is the cause and effect of futuristic technologies in every sphere of human life. ■

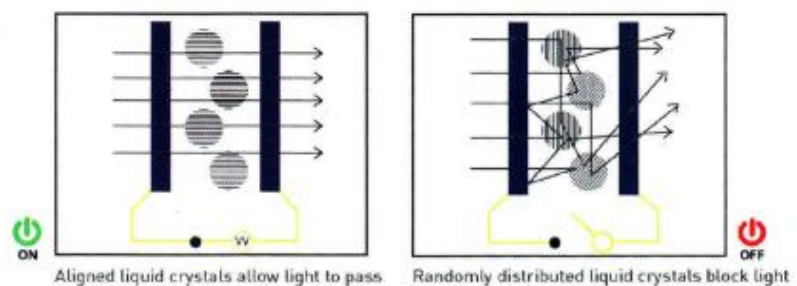


Fig. 1 - Working of AIS Swytchglas





