

# Clariti

LET'S TALK GLASS



Dear Readers,

It gives me great pleasure to present to you another issue of Clariti.

Like all the previous issues, this issue too looks into some exciting trends and developments in the world of glass. The **Cover Story**, by a guest author, discusses the importance of the fenestration design in buildings, with a view to increasing the comfort factor. The **Case Study**, by the same author, features a building in Haryana built on the principles of climate-responsive architecture. The section **Eye Catcher** presents a visually stunning project in Shillong. **Inside Info** shows how glass can do wonders for the hospitality industry. In **AIS Fresh**, we get to know more about AIS' digital initiative that has made the experience of glass even more amazing.

I hope you will like reading this issue of Clariti. I look forward to knowing your thoughts and opinions.

Happy reading!

Vikram Khanna  
COO – Consumer Glass  
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## Cover Story: Importance of Fenestration Design in Building Envelope

Author: Mr. Akash Deep, Programme Manager – GRIHA Council (Green Rating for Integrated Habitat Assessment), Cities, Buildings, and Transport, TERI (The Energy and Resources Institute)

Comfort is a universal need for all humans. One of the most important manifestations of this requirement is the making of houses and buildings that provide utmost comfort to their occupants. To ensure this, a building is designed according to the local climate – this design intent is termed 'climate-responsive architecture'. India is divided into five climate zones as per the Energy Conservation Building Code (ECBC).

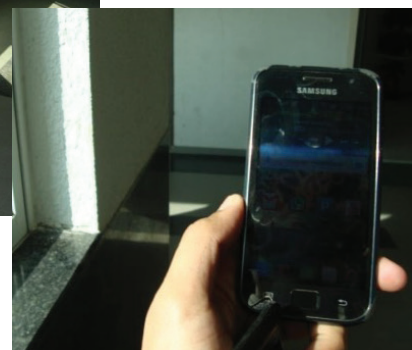
The envelope is the most important component of a building, working as a physical separator between its interior and exterior. Typically, the different components of a building envelope are: walls, floors, roofs, fenestrations, and doors. Fenestrations are openings in a structure, such as windows, skylights, clerestories, etc.

An opening in a building serves two major purposes: natural lighting and ventilation. Another purpose – a physiological one – is connectivity with nature.

Natural lighting is crucial for achieving visual comfort inside a building. The intensity of natural light should be optimized, because high intensity (refer Images 1 and 2) causes glare, and, conversely, low intensity results in dull lighting. Furthermore, glare-free daylighting reduces energy demand for artificial lighting.



**Image 1: Daylight with glare**



**Image 2: The intensity of light can be measured in lux**

As per NBC 2016, there are specific light intensities for performing different activities comfortably within buildings (refer Table 1).

Section 17	Commerce	Range of Service Illuminance (lux)
17.1	Offices	
17.1.1	General offices	300-500-750
17.1.2	Deep plan general offices	500-750-1000
17.1.3	Computer workstations	300-500-750
17.1.4	Conference rooms, executive offices	300-500-750
17.1.5	Computer and data preparation rooms	300-500-750
17.1.6	Filing rooms	200-300-500
17.2	Drawing offices	
17.2.1	General	300-500-750
17.2.2	Drawing boards	500-750-1000
17.2.3	Computer-aided design and drafting	
17.2.4	Print rooms	200-300-500
17.3	Banks and building societies	
17.3.1	Counter, office area	300-500-750
17.3.2	Public area	200-300-500

**Table 1: Recommended values of illumination as per NBC 2016**

An interesting aspect of a building design is that fenestration controls the amount of daylight that is received in a building during daytime. On a bright sunny day, the intensity of light can range from 90,000 lux to 1,00,000 lux. Each and every component of fenestration design – shading, orientation, climate zone, post-operation maintenance – facilitates visual comfort without excess glare.

With more and more buildings taking to air conditioning, fenestrations no longer facilitate **natural ventilation**. However, the effective use of natural ventilation helps achieve thermal comfort without depending on energy-intensive air conditioning. Natural ventilation can be integrated into the design by proper massing and site planning which influence flow and intensity of the wind around the building block. The placement and orientation of the openings in a building influence the infiltration rate and flow of wind around the occupied space. Shading design also influences wind flow within the rooms through windows. It helps channelize wind flow and achieve the desired wind flow intensity.

Of late, with increased demand for sustainable buildings, there is more emphasis on the energy efficiency of systems. However, demand reduction through climate-responsive architecture should be the foremost step towards achieving energy efficiency in a building.

S. No.	Application	Air change per hour
1.	Assembly rooms	4-8
2.	Bakeries	20-30
3.	Banks / Building societies	4-8
4.	Bathrooms	6-10
5.	Bedrooms	2-4
6.	Billiard rooms	6-8
7.	Boiler rooms	see Note 2
8.	Cafés and coffee bars	10-12
9.	Canteens	8-12
10.	Cellars	3-10
11.	Changing rooms	6-10
12.	Churches	1-3
13.	Cinemas and theatres	10-15
14.	Club rooms	12, Min
15.	Compressor rooms	10-12
16.	Conference rooms	8-12
17.	Corridors	5-10

**Table 2: Recommended values of air changes as per NBC 2016**

## Case Study: Climate-Responsive Architecture

Author: Mr. Akash Deep, Programme Manager – GRIHA Council (Green Rating for Integrated Habitat Assessment), Cities, Buildings, and Transport, TERI (The Energy and Resources Institute)

As mentioned in the Cover Story, climate-responsive architecture provides comfort to a building's occupants. Many architectural design solutions are available to facilitate diffused, glare-free daylight and natural ventilation in a building.

This case study elaborates on the sustainable features implemented in an office building located in the hot and dry climate of Haryana (refer Figure 1). Some of the special features of this building are as follows:

- There is no air conditioning system to provide thermal comfort. The southern glass façade and solar chimney cause heating of the air in the office spaces. The hot air is carried away through louvered vents provided in the solar chimney. Misting is done in the central courtyard to cool the air. Due to the negative pressure created in the office spaces, cold air from the courtyard flows inside through the 'jallis' provided at the bottom of the corridor walls. This phenomenon facilitates natural air cooling.
- Major facilities, such as toilets, staircases, etc., are located on the east and west façades to minimize heat gain and glare from

the east and west directions.

- The window design in the east / west façade facilitates glare-free daylight.



**Figure 1: Plan showing the east-west window design and solar chimney in the south façade, and a combination glass and solar chimney façade**



# Eye Catcher!

A mosque in Shillong with AIS Opal - a range of hard-coat solar control glasses from AIS



## Inside Info: A welcoming experience with glass

With rising competition in the hospitality industry, interior design has become an important differentiator that sets a place apart from the others. Customers regard ambience as one of the most important factors for selecting a hotel, restaurant, café, or pub.

Glass is a versatile building and design material that can help create interiors that are stunning and comfortable. The availability of a wide variety of glasses today means that designing a commercial space is limited only by the owner's imagination.

The **aesthetics** of a place is what creates the first impression on guests. The use of decorative glasses can give a distinctive and classy look to interiors. Lacquered glass – such as **AIS Décor** – gives a stylish touch when used for backsplashes, tabletops, counters, and flat surfaces due to its coloured, opaque appearance. Subtle artistic effects can be achieved with the use of fabric laminated, printed, and etched glasses on partitions, balustrades, and panels. **AIS Fabric Laminated Glass** has beautiful textured fabrics placed between two glasses. Digitally

printed glasses are durable with high quality prints. **AIS Etched Glass** is made by applying an acidic substance on the glass surface to create artistic patterns / designs.

**Privacy** is a much-valued factor for guests, with many cafés and restaurants having limited space. Frosted glass, which is translucent, obscures the view while allowing light to pass through and is ideal for privacy with aesthetics. It is also a great choice for building glass staircases in constricted spaces. **AIS Krystal** is a popular, high-quality, frosted glass. A revolutionary new way of achieving privacy-on-demand is 'smart glass' which turns from transparent to translucent at the touch of a button. Such glass strikes the perfect balance between style and necessity, and helps to make the most of space constraints. **AIS Swytchglas** is an example.

A major concern for guests and owners alike is **noise**. Noise-resistant glasses, like **AIS Acousticglas**, enable excellent sound insulation with aesthetic appeal and without restricting the outside view.



Even more important is the **safety and security** of a place and its occupants. Tempered and laminated glasses, that are highly durable and impact-resistant, prevent breakage and provide protection from burglar attacks.

An unavoidable issue facing the hospitality sector is **high energy costs** due to increased air conditioning and lighting requirements. Glass, again, comes to the rescue. A wide range of high-performance glasses, like **AIS Ecosense**, help to achieve the perfect balance between energy efficiency and optimum day-

lighting. 'Cool' ways of cutting down electricity bills with aesthetic flair!

There are many other interior design aspects that can be addressed with glass more than with any other material – because of the multifunctionality and timeless aesthetic appeal of glass.

## AIS Fresh AIS' mobile app is a new way to see glass

The newly launched AIS app – **AIS World of Glass** – helps you experience glass like never before! Glass has never looked better, with the complete spectrum of AIS' products, services, and solutions aesthetically showcased in the user-friendly AIS World of Glass app. Some key features of this amazing app include:

- **Solutions in Glass:** This section categorizes AIS products as Acoustic, Privacy, Safety, Aesthetic, and Energy Efficiency solutions.
- **Solutions for Doors and Windows:** This section shows all the glass door and window solutions on offer as two substrates – uPVC and Wooden.
- **Specialized Applications:** This showcases our exquisite and innovative glass solutions like glass staircases, infinity pool, skylights, canopies, and much more.

- **Experience Zone:** This is where one can experience AIS' Privacy and Security solutions, and get the real feel of glass – at the touch of a button.
- **Glass Applications:** This is where one can browse through the myriad glass applications that are showcased.
- **Connect with us:** This is where the viewer can share her / his requirements and our team will connect with her / him to offer the best solutions in glass.

The mobile app is a great medium to showcase the value proposition of our products, and has been warmly welcomed by our customers. It is available on Android and iOS.