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Clariti

LET'S TALK GLASS

Dear Readers,

I am extremely happy to bring to you yet another issue of Clariti, which has been well-received since its inception in 2014.

In every issue of Clariti, we talk about some interesting trends and news from the exciting world of glass. In this issue, the **Cover Story** explores the importance and possibilities of daylighting in architecture and interior design. **Daylighting**, achieved correctly, has been known to improve people's happiness and productivity. **The Case Study** shows that daylight analysis of inclined facades is important for selecting the right glazing solution for buildings.

The section **Eye Catcher** presents a project with AIS Ecosense in a private residence in Chandigarh. **Inside Info** is about how glass applications can make a small and ordinary kitchen look larger and stylish to match today's contemporary lifestyles. **AIS Fresh** talks about the new additions to the architectural product portfolio of AIS.

I hope you will enjoy going through this issue of Clariti. I look forward to hearing your thoughts and opinions.

Happy reading!

Vikram Khanna
COO – Consumer Glass
COO – Architectural Institutional Business
CMO, CIO

Cover Story: The window to a better life!

From ancient buildings in Persia to the large glass window displays in neo-Gothic churches, the practice of making use of natural daylight for internal lighting has been favoured by architects and interior designers across the world. This preference to daylight can be attributed to the many benefits that it offers including reduced energy consumption, increased savings, natural aesthetic appeal, and enhanced occupant well-being among several others.

As we journey into the future, windows, skylights, baffles, light shelves, and louvres are increasingly being perceived as psychological regulators apart from their use to provide ample and uniform natural daylight. Due to this very reason, utmost care and diligence have to be taken in evaluating the effectiveness of the various daylighting options, so as to ensure optimum functionality, enhanced ergonomics, and improved mindset and productivity.

Bigger Windows for Better Health

Recent studies have shown that people tend to spend 80% of their lifetime within buildings, and daylight plays a fundamental role in the body-clock synchronisation and the maintenance of a stable circadian rhythm. Bigger windows provide better access to daylight, enhancing the health and well-being of the occupants. Some of the proven health benefits of daylight include:

- Faster recovery in post-operative scenarios
- Alleviates Seasonal Affective Disorder (SAD) and the milder form – S-SAD
- Livens and improves psychological mood
- Improves attentiveness, especially in children

Bigger Windows for Improved Efficiency

Energy and thermal simulations conducted across different climate zones have demonstrated that optimising the area of the external envelope occupied by high-performing windows **helps reduce the overall energy consumption of a building.** In many existing low-energy buildings across the world, glass already plays an indispensable role in achieving high-energy performance standards.

Bigger Windows for a Greener Future

Glass being a sustainable material helps minimise the environmental footprint of buildings and reduces dependency on fast-depleting energy sources. Although CO_2 is generated during the manufacturing phase, it is compensated and often dwarfed by the CO_2 saved by replacing inefficient glazing with high-performing windows. In addition, windows hold the smallest environmental footprint across all LCA indicators compared to other parts of the building envelope.

Daylight Without the Discomfort

Quite often, people experience discomfort caused by the sun in the form of glare and excess heat gain after switching to natural lighting. This poses a task for architects to evaluate and choose those daylight options that minimise discomfort and maximise visibility. Given below are some of the factors that need to be considered to ensure optimal lighting:

Right window orientation and area

Selecting the right window orientation, design, and area can help disperse light evenly across daytime and interior space, without causing glare and excess heat gain, thus ensuring the best use of available daylight. Moreover, based on the orientation, south-facing windows let in the highest amount of daylight, whereas north-facing windows let in diffused and reflected glare-free light. On the other hand, east- and west-facing windows let in direct sunlight, glare, and heat gain, which are difficult to manage.

Appropriate diffusers and shades

A number of devices are available to ensure an even spread of daylight across the building interiors. Skylights, roof monitors, and light tubes are some top-lighting sources, and baffles placed under them help diffuse the light uniformly. Light shelves and horizontal louvres integrated into windows can also be used as shading devices to block direct sunlight.

Facades and glazing

A wide variety of high-performance solar control / heat reflective glasses are available today in clear and tinted options that can regulate heat gain and lighting as desired by the user. However, heavy tints and dark shades can reduce light transmission, and hence the need to determine the priority: maximised daylighting (for top-lighting devices), or reduced glare (for windows and facades).

Smart tools

A number of tools are available for evaluating the efficiency of various daylighting options. The Radiance Program by Lawrence Berkeley National Laboratory (LBNL) simulates the architectural space in all light / weather conditions and provides accurate predictions. COMFEN, also by LBNL, simulates 'what-if' scenarios for different facades on the basis of their location and orientation, and enables a quick comparison of all available glazing options.

A Window to the Future

Effective utilisation of daylight requires careful consideration, assessment, and evaluation of the various available options. It is crucial to achieve the right balance of light and heat without glare and other hassles, so as to ensure comfortable and happy living and work spaces. From helping save invaluable energy to offering immense health benefits, having bigger windows for daylighting is no more an architectural fad, but a logical option for architects and inhabitants alike.

Case Study: Daylight analysis of inclined facades for glazing

This case study shows why glazing solutions should be selected only after taking the building design into due consideration.

For a corporate building in Mumbai, a daylight analysis was done for Clear Glass (VLT = 78%) and the high performance glass (VLT = 21%). Both the glasses performed identically in terms of achieving the optimal lux levels. Clear Glass, in fact, caused glare in certain portions of the building.

In Fig. 2, the first case is Clear Glass (VLT = 78%). The pink region shows the area which will have glare, and the grey region indicates sub-optimal lighting.

The second case is high-performance glass (VLT = 21%). Here we can see the reduction in glare area without reducing optimum lux level.

Points to note:

- Daylight analysis is important as it prevents overdesigning of the building and at the same time optimises VLT requirement.
- In this case, we can use high-performance glass which will reduce cooling load without compromising on the lighting load.

The result:

- The same fenestration behaves differently depending on the specific design.
- It should not be assumed that products with low U-Value and SHGC are the best, and universal solution.
- For windows receiving a high amount of solar radiation, products with low SHGC would perform better.

Hence, a glazing solution should be selected only after thoroughly analysing the building design.

Fig. 1

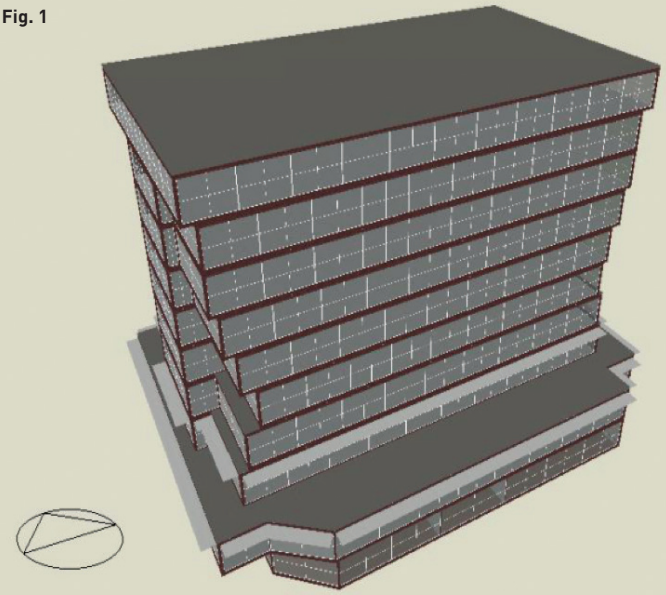
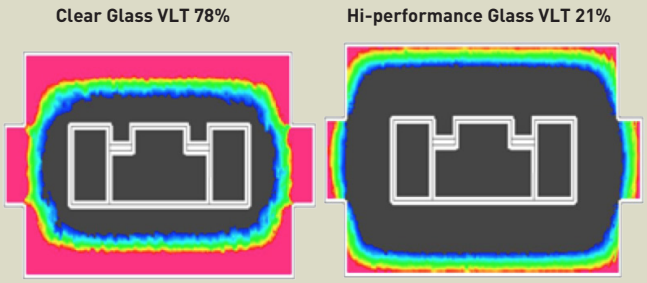


Fig. 2



Eye Catcher!

A project with Ecosense: Range of high performance, soft-coat glasses

Ecosense Enhance - Solar Control Glass in a private residence in Chandigarh

Inside Info: In great taste

Kitchens have come a long way from being just a place to cook food. The preference for open kitchens in many modern homes has led to the trend of combining the dining and cooking spaces. As such, today's kitchens are required to be as aesthetically appealing as functional, and to blend with the overall design of the house while retaining its unique look as the heart of the home. And if there's one material that can achieve all of the above, it's glass.

Kitchens are smaller in size than the other rooms in most homes; and glass is the perfect solution for making kitchens look larger. By reflecting light, illuminating surfaces, and connecting spaces – such as the inside to the outside, glass gives a lively and spacious ambience to even the smallest kitchen.

Use of glass for kitchen countertops has become very popular. Glass countertops can be customised in terms of colour, size,

and shape. Combining **countertops with glass backsplashes** and cabinets creates a stylish and colourful ambience. **Pantry doors** can feature **a glass panel** to match a particular theme or décor. Clear, frosted, fabric-laminated, and lacquered / back-painted glasses can be used in kitchens for stunning effects.

The practical advantages of using glass in kitchens is that it is stain-resistant, easy to clean and maintain, and easy to replace. As such, a kitchen in which glass is used gives the look and feel of being always new!

As a material for interiors and exteriors, glass lends itself to myriad possibilities in terms of design and functionality, limited only by one's imagination.

AIS Fresh

Once again, AIS makes additions to its portfolio. These are:

Ecosense Edge - Solar Control Glass (Low-E range)
The new series – Edge – combines the best of functionalities with best-in-class, eco-friendly features. It is a solar control glass with thermal insulation (Low E) properties, which can be used in single glazing applications. It is ideal for use in structural glazing, facades, windows, and skylights. Ecosense Edge is available in three shades – Clear (Natura), Blue (Electra), and Green (Chroma).

SunShield Supreme Gold Heat Reflective Glass
A high-performance, aesthetically appealing product, SunShield Supreme Gold, combines durability with advanced solar control technology to effectively reduce heat ingress.