LIGHT & ENERGY

WITH LEXAN™ SOLAR CONTROL IR SHEET



LEXAN™ SHEET

POLYVANTIS

ABOUT POLYVANTIS

POLYVANTIS business is a leading supplier of high performance engineering sheet products, serving customers around the world in a broad spectrum of applications. Our virtually unbreakable, lightweight, fire resistant sheet product portfolio includes a wide variety of structures, ranging from solid and multiwall to corrugated sheet. The company has integrated extrusion processes, surface texturing, and coating technologies to provide value added solutions across a wide variety of industries.

At POLYVANTIS, we are dedicated to meeting our customers'ever changing needs with our high performance LEXAN™ sheet portfolio. Our material solutions and services help our customers to reduce their system costs and create innovative designs and environmentally responsible materials.

POLYVANTIS ongoing investment in world-class technologies demonstrates our commitment to helping our customer's technical requirements, application development needs and business goals.

LEXAN SOLAR CONTROL IR SHEET

Transparent polymer glazing reduces interior heat buildup while maintaining the highest level of light transmission.

We understand our customers' concern for top-notch energy efficiency. POLYVANTIS family of transparent, solar-control glazing products reduces solar transmission while simultaneously offering high levels of light transmission. The sheets, available in solid and multi-wall polycarbonate varieties, significantly reduce energy costs for cooling and lighting buildings.

Both solid and multiwall products are excellent candidates for roof domes, skylights, walkways, conservatories, and other buildings that require high levels of light without the excess heat. Additionally, the solid sheet product can be used for public transportation applications, such as train and bus glazing.



SOLAR CONTROL GLAZING

LEXAN Solar Control sheets give access to light while blocking heat.

Current architectural design calls for building glazings that permit high levels of natural light, both for aesthetics and to reduce energy for interior lighting. However, intensive use of glazing can lead to rapid interior heat buildup due to penetration of near-infrared (IR) radiation (solar transmission) through the glazing, especially in hot and sunny climates. This, in turn, can raise energy costs for cooling the building.

Previous solar-control glazing, the only polymer alternative, used a screen-printed coating or a co-extruded layer on one side of the sheet to absorb IR transmissions. But the coating and co-extruded layer made the glazing translucent – at best – or opaque, greatly reducing light transmission. Hence, architects who wanted to use polymer glazing had to choose between light transparency and solar control. They could not find both properties in one product unless they went to expensive solar controlled glass.

FIGURE 1

POLYVANTIS' unique proprietary resin additive in the LEXAN Solar Control IR sheet selectively separates IR waves from the visible light.

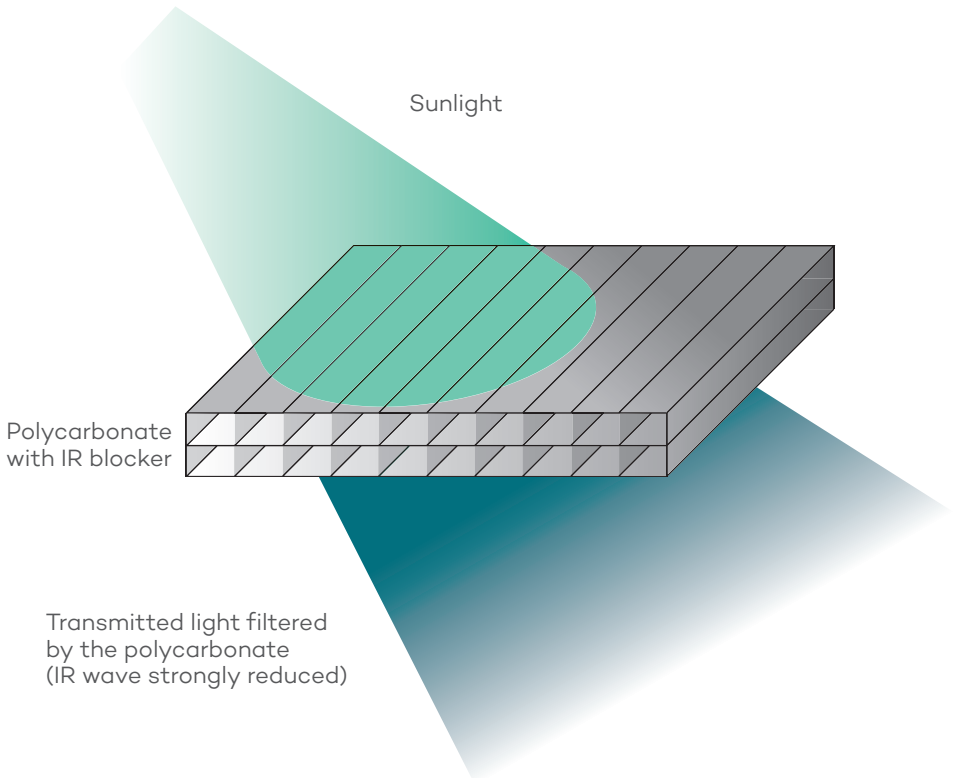


FIGURE 2

LEXAN solid and multiwall sheets have the highest transmission in the visible part of the light.

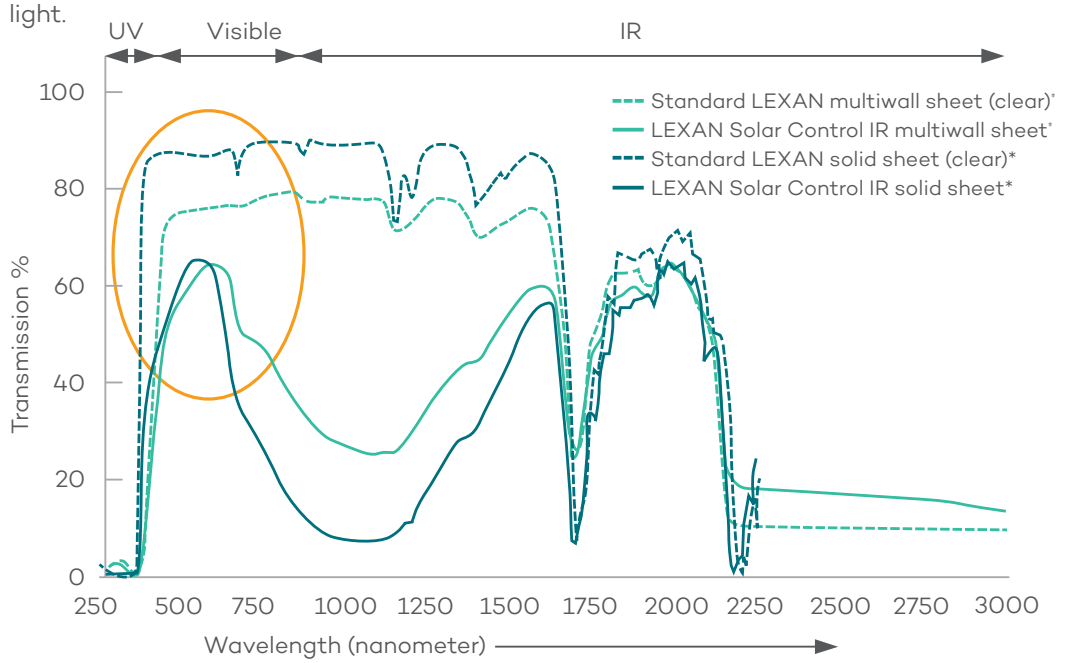
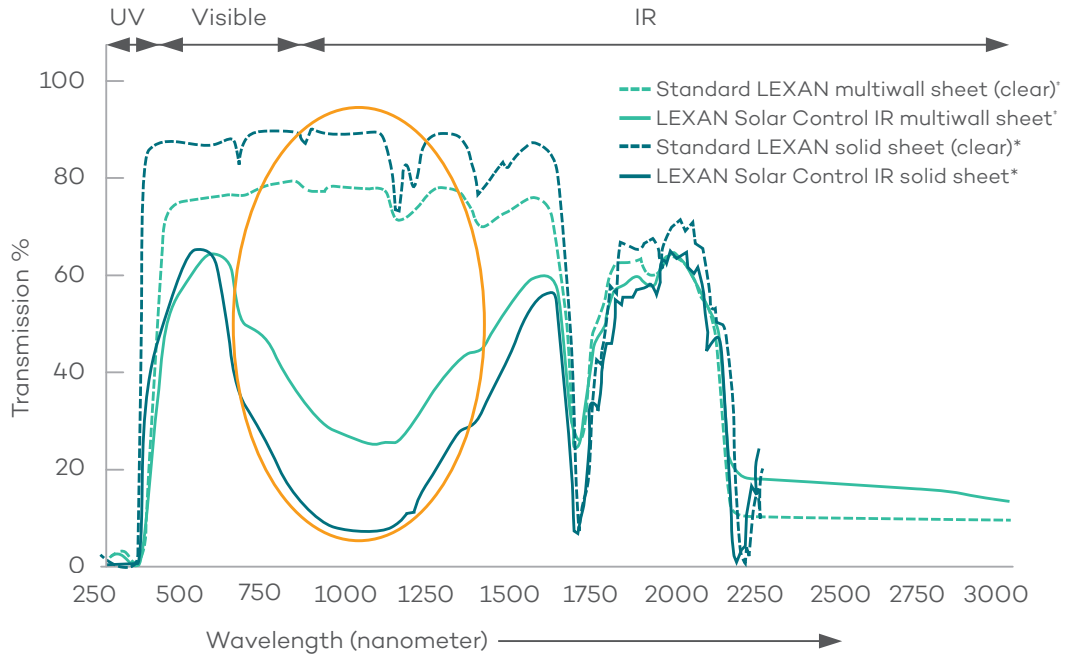


FIGURE 3

LEXAN Solar Control IR sheet selectively blocks the near infrared region of the light, therefore reduces the heat buildup.



‡ Indicates 16mm 3 walls * Indicates 3mm

BENEFITS

UP TO 40% ENERGY SAVINGS

POLYVANTIS' model-scale* energy consumption studies at the Welch Technology Center in India show that by using LEXAN Solar Control IR sheet, interior heat buildup can be reduced significantly, which could result in 25%-40% energy savings in a temperature controlled environment.

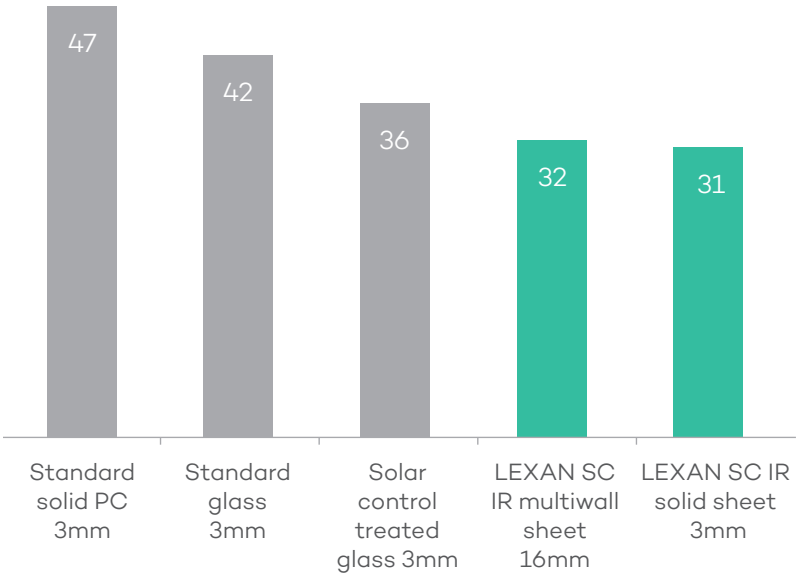
In figure 4, the relative annual energy consumption to maintain room temperature between 20 and 27 °C is shown for several materials. LEXAN Solar Control IR sheet shows the lowest energy consumption compared to other glazing solutions.

The result can vary with building design, climate, and heating/cooling equipment. Therefore, POLYVANTIS has developed a calculation tool to estimate energy savings as a function of several of those variables. Please contact our development engineers to get a personalized estimate of potential savings for your project via info.lexan@polyvantis.com.

* We conducted a conducted a climate simulation on a model building (8 m x 6 m x 2.7 m) with a 12 m^2 window (looking at north) and 48 m^2 roof glazing surface.

FIGURE 4

Comparison of total annual cooling and heating energy usage in thousands of Kwh in a modeled building.





HEAT-MANAGEMENT GLAZING

FIGURE 5

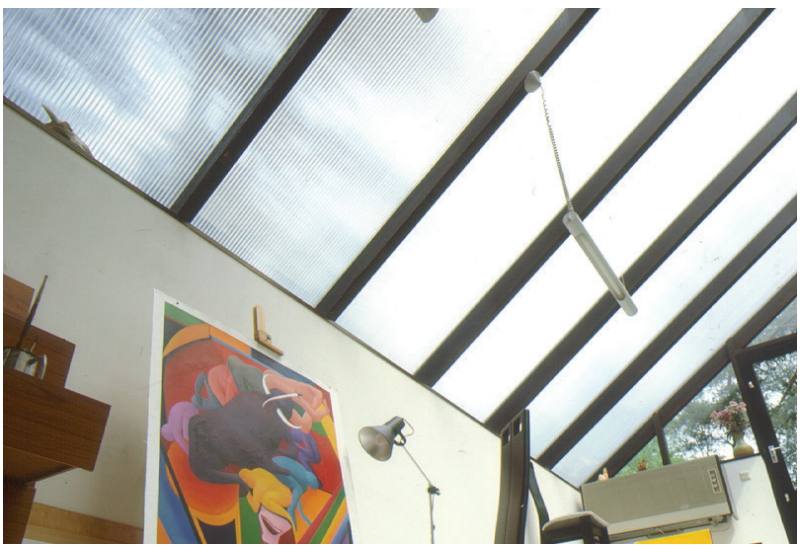
	LT	ST	LSGR	SC
Standard LEXAN solid sheet 3 mm	0.88	0.68	1.02	0.99
LEXAN Solar Control IR solid sheet 3 mm	0.61	0.51	1.21	0.58
Glass 3 mm	0.91	0.86	1.06	1.0
Low E‡ glass 3 mm	0.85	0.63	1.35	0.72
Standard clear LEXAN multiwall sheet 16 mm*	0.74	0.78	0.94	0.89
LEXAN Solar Control IR multiwall sheet 16 mm*	0.55	0.52	1.05	0.60

‡ Low-emission glass (Low-E) is a clear glass that has been coated with a microscopically-thin coating of metal oxide

* Measurement is performed according to ISO 9050 (NEN - EN410)

Comparison of light transmission (LT), solar transmission (ST) and light to solar gain ratio (LSGR). To maintain high interior lighting, you need a high light transmission (LT) value. On the other hand, to reduce heat entering the building, you need to get a low solar transmission (ST) and therefore, having a solar factor as high as possible (SF>1). SC is shading coefficient = ST/0.87.

$$\text{Light to solar gain ratio (LSGR)} = \frac{\text{Total light transmission(LT)}}{\text{Total solar transmission(ST)}}$$



LEXAN SOLAR CONTROL IR SHEET REDEFINES HEAT-MANAGEMENT GLAZING

POLYVANTIS' heat-management glazing makes use of an innovative technology platform. Instead of being translucent or opaque as previous products, the LEXAN Solar Control IR sheet materials are transparent with a light green tint, which blocks near-infrared heat but lets in high levels of light.

Proprietary resin additives are used to manage heat instead of expensive and fragile coatings, which can be damaged during handling and installation. Because the additive technology is inherent to the polymer, solar control properties are permanent and sheets are UV protected on both sides, which can help installers reduce losses due to installation errors.

PRODUCT AVAILABILITY

The solid sheet product is called LEXAN EXELL D™ Solar Control IR sheet, and the multi-wall product is called LEXAN THERMOCLEAR™ Solar Control IR sheet.

The LEXAN Solar Control IR sheet products are available in all standard gauges and dimensions. As with conventional solid and multi-wall LEXAN sheet, this glazing offers outstanding design freedom due to its ability to be cold formed and/or thermoformed (vacuum or blow form) without losing impact or weathering properties. Both versions come with a 10-year limited written warranty against reduction of light or solar transmission properties, yellowing, and breakage due to hail impact. Please contact your local POLYVANTIS sales office to get more information.

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www.polyvantis.com

LEXAN™ POLYCARBONATE FILM & SHEET | Tough, Virtually Unbreakable