



Lighten the load.

Introducing GlassX – the world's first
Thermodynamic Glazing system.

 **GLASSX**
Thermodynamic Glazing

PRODUCT INNOVATION
AWARD WINNER **PIA'11**



Radiantly advanced.

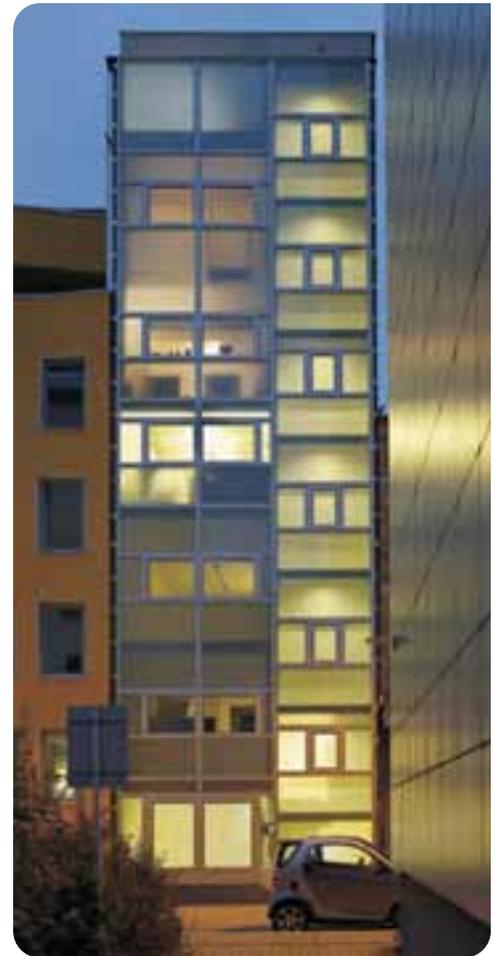
Due to the solar properties of glass, natural lighting comes at a high price: wasted energy. Well, no longer thanks to GlassX.

Though it has a thermal mass equivalent to a 16" concrete wall, GlassX is translucent, allowing architects flood spaces with natural light. No electronic or moving parts; just lower energy costs and bright, comfortable spaces.

Welcome to the 21st century.

GlassX's key benefits:

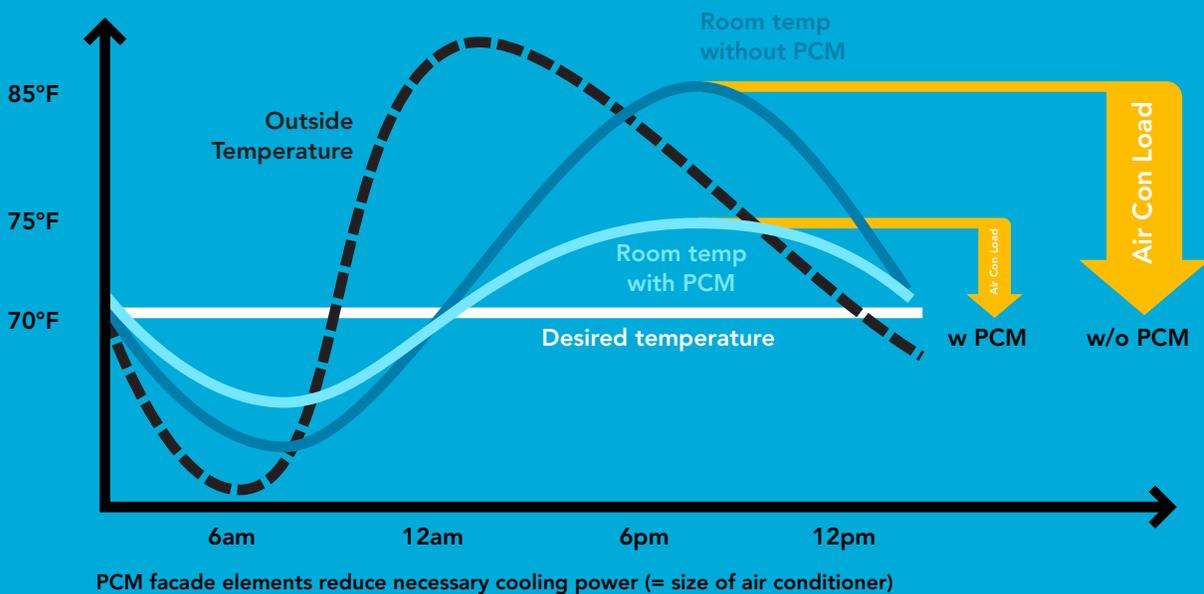
- GlassX offers building owners quick return on investment
- GlassX lets architects easily incorporate natural light into their designs while making a massive contribution to LEED certification
- GlassX increases comfort by stabilizing interior temperatures without drafts or fan noise



A View to the Future

GlassX provides architects with a sustainable solution when working with glass envelope designs. The use of GlassX panels reduces energy use from 30-50%, utilizing light and heat efficiently and comfortably without any follow-on costs. As seen below, it will significantly reduce the size requirements for HVAC systems. GlassX will consistently deliver the right amount of thermal storage at the right time, and is sure to make any building more comfortable, productive and environmentally-friendly.

PCM + Air Conditioning Reduction





GlassX's translucency adds an exciting new option to the architects' design palette.

How GlassX works

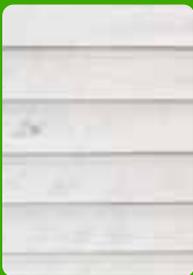
Phase Change Material

At the heart of GlassX is its Phase Change Material (PCM). As ambient temperatures rise, the PCM changes phases from solid to liquid. As the environment cools, the PCM solidifies, releasing the latent heat it's stored.

The PCM core of GlassX is comprised of salt hydrates, hermetically sealed in clear polycarbonate. It has a latent thermal storage of up to 376Btu/ft², which means an average of 8 hours before heat is transferred.

This thermal storage has two effects; shifting peak energy demand later into the night when temperatures typically fall off, and reducing average interior room temperatures by 5-9°C, drastically reducing the need for air conditioning. In winter, GlassX maximizes solar gains, charging up the PCM core, allowing it to radiate throughout the night as it solidifies.

GlassX's PCM, changing states



Solid



Crystallizing



Liquid

Seasonally Adaptive

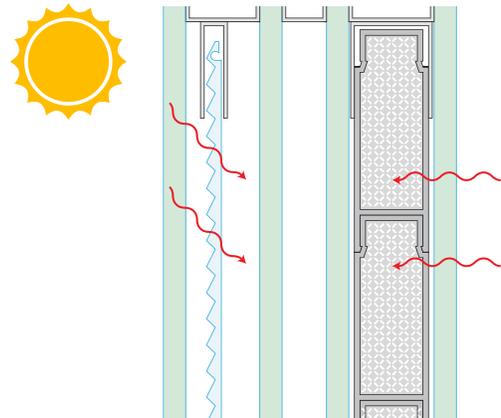
How does GlassX know what season it is? Thanks to its prismatic later, GlassX reflects summer solar radiation (>40°) but allows winter solar radiation to pass (<35°), in effect creating a variable g-value.

And all-in-one solution

GlassX allows natural light to pass into the interior of the building for daylighting purposes. When solid, GlassX PCM has a light transmission of roughly 28%. Completing the all-in-one passive solar design is quadruple insulated glazing with inert gas and low-e coatings, which provides insulation equivalent to that of an R12 wall.

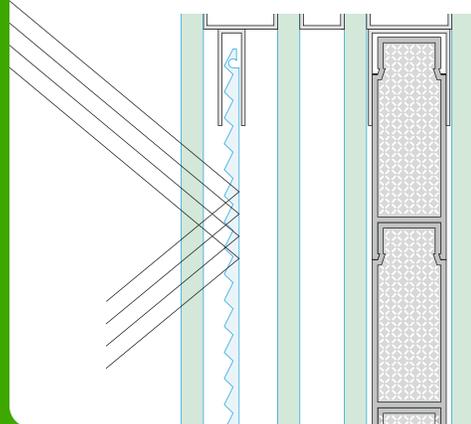
The PCM Effect

Heat absorption & storage



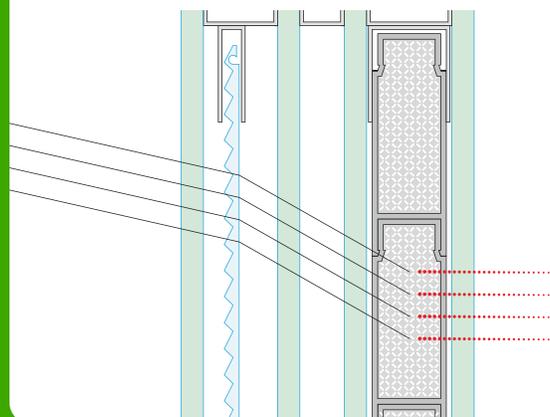
Summer

Sun high in the sky > 40°
Total reflection of the rays



Winter

Sun low in the sky < 35°
Loss-free passage of the rays



The GlassX Family: Technical Data

GlassX Crystal

Glass 1 exterior	Tempered safety glass
Gap between panes 1	Gap between panes with prism plate and inert gas
Glass 2	Tempered safety glass with Low-E
Gap between panes 2	Gap between panes with inert gas
Glass 3	Tempered safety glass with Low-E
Gap between panes 3	Gap between panes with PCM-plate
Glass 4 interior	Clear Floatglas, optional with ceramic screenprint*

Element thickness	62 - 86 mm
Thickness tolerance	-1/+4 mm
Fold width	67 - 96 mm
Weight	max. 95 kg/m ²
Max. surface area	6,0 m ²
Max. height	3000 mm
Max. width	2000 mm
Heat transmission coefficient (U-value)	up to 0,48 W/m ² K
Light transmission	
for crystalline PCM	8 - 28 % (± 3 %)
for fluid PCM	12 - 44 % (± 4 %)
Total energy transfer ratio (g-value):	
vertical direct irradiation	
for crystalline PCM	33 % (± 4 %)
for fluid PCM	37 % (± 4 %)
diffuse irradiation	29 %
seasonal winter months	
for crystalline PCM	33 %
for fluid PCM	35 %
seasonal summer months	
for crystalline PCM	6 %
for fluid PCM	9 %
Storage capacity	1185 Wh/m ²
Storage temperature	26 - 28 °C

* completion as safety glass

GlassX Comfort

Glass 1 exterior	Tempered safety glass
Gap between panes 1	Gap between panes with and inert gas
Glass 2	Tempered safety glass with Low-E
Gap between panes 2	Gap between panes with inert gas
Glass 3	Tempered safety glass with Low-E
Gap between panes 3	Gap between panes with PCM-plate
Glass 4 interior	Clear Floatglas, optional with ceramic screenprint*

Element thickness	52 - 72 mm
Thickness tolerance	-1/+4 mm
Fold width	57 - 82 mm
Weight	max. 92 kg/m ²
Max. surface area	6,0 m ²
Max. height	3000 mm
Max. width	2000 mm
Heat transmission coefficient (U-value)	up to 0,48 W/m ² K
Light transmission	
for crystalline PCM	8 - 28 % (± 3 %)
for fluid PCM	12 - 44 % (± 4 %)
Total energy transfer ratio (g-value):	
vertical direct irradiation	
for crystalline PCM	33 % (± 4 %)
for fluid PCM	37 % (± 4 %)
Storage capacity	1185 Wh/m ²
Storage temperature	26 - 28 °C

* completion as safety glass

GlassX Prism

Glass 1 exterior	Tempered safety glass
Gap between panes 1	Gap between panes with prism plate and inert gas
Glass 2	Tempered safety glass with Low-E
Gap between panes 2	Gap between panes with inert gas
Glass 3 interior	Tempered safety glass with Low-E optional with ceramic screenprint

Element thickness	32 - 54 mm
Thickness tolerance	-1/+4 mm
Fold width	37 - 63 mm
Weight	max. 54 kg/m ²
Max. surface area	6,0 m ²
Max. height	3000 mm
Max. width	2000 mm
Heat transmission coefficient (U-value)	up to 0,48 W/m ² K
Light transmission	up to 54 %
Total energy transfer ratio (g-value):	
vertical direct irradiation	44 % (± 5 %)
diffuse irradiation	29 %
seasonal winter months	41 %
seasonal summer months	12 %

GlassX Comfort

Glass 1 exterior	Tempered safety glass
Gap between panes 1	Gap between panes with PCM-plate
Glass 2	Tempered safety glass optional with ceramic screenprint

Element thickness	34 - 38 mm
Thickness tolerance	-1/+4 mm
Fold width	33 - 40 mm
Weight	max. 92 kg/m ²
Max. surface area	6,0 m ²
Max. height	3000 mm
Max. width	2000 mm
Light transmission	
for crystalline PCM	0 - 38 % (± 3 %)
for fluid PCM	4 - 55 % (± 3 %)
Total energy transfer ratio (g-value):	
vertical direct irradiation	
for crystalline PCM	33 % (± 4 %)
for fluid PCM	37 % (± 4 %)
Storage capacity	1185 Wh/m ²
Storage temperature	26 - 28 °C

For interior use



glassxpcm.com
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