The underestimated benefits of teaming low-e and thermochromic glass technology

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What is solar responsive thermochromic (SRT) glass?

SRT glass is a type of dynamic glass with a thermochromic PVB interlayer which harnesses the sun's rays to alter the light transmission properties based on the amount of direct sunlight hitting the external surface.

That is, it self-tints as necessary to block excessive heat from entering a building when the sun is at its hottest and highest position in the sky and returns to its natural state in the absence of direct sun light - so the amount of daylight is as it should be at all times.

While low-e glass has become norm with rapid advancements in this technology, what isn't as well understood is how much better a low-e IGU performs when combined with SRT technology.

It is not as difused in the Australian market as others which could be due to a lack of education, some misconceptions, price and other factors. But with increased legislation and demand for energy efficiency we must innovate and evolve - and SRT glass is already leaps and bounds ahead.

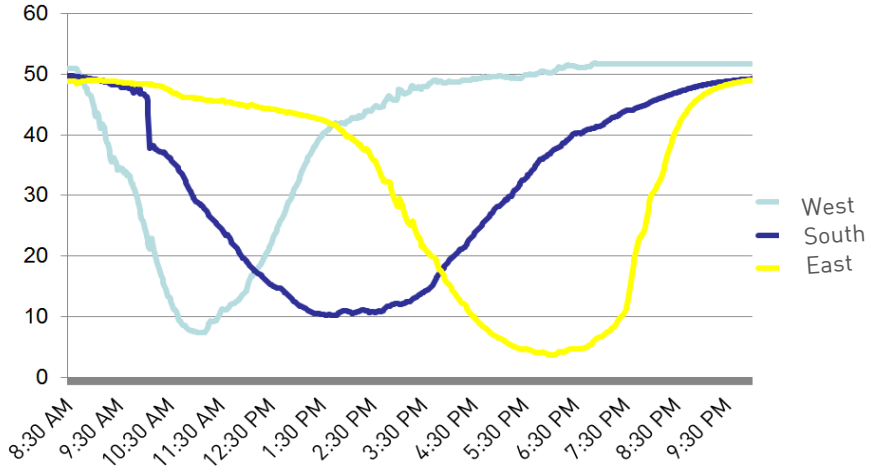
Dispelling some misconceptions about SRT glass

1. **When the tint is active it blocks natural sunlight**
   False. In fact when glass is at full tint the room is actually lit up at its brightest, minus the glare and discomfort.
2. **It is only needed in hot climates**
   False. It works on external temperatures to provide the right amount of daylight and solar heat in all conditions.
3. **It is significantly more expensive**
   False. The initial price difference pays itself off almost immediately by negating the need for blinds, overhangs and exponentially year on year in related maintenance costs, energy costs and occupant productivity in the case of workplaces. Therefore it actually saves you money.
4. **It has a limited lifespan**
   False. As it is a PVB interlayer and not a coating, it is actually expected to outlast the life expectancy of the sealants.
5. **It is more difficult to install**
   False. It takes the same amount to install as regular glass and requires no additional skill.

Time of day vs light transmission

This diagram illustrates the extent to which the light transmission naturally adjusts itself at different times of the day from different elevations.

The y-axis shows the visible light transmission (VLT) percentage and coloured lines indicate west, south or east VLT throughout the day which varies so considerably due to the relative position of the sun. No other glass can boast the same ability.

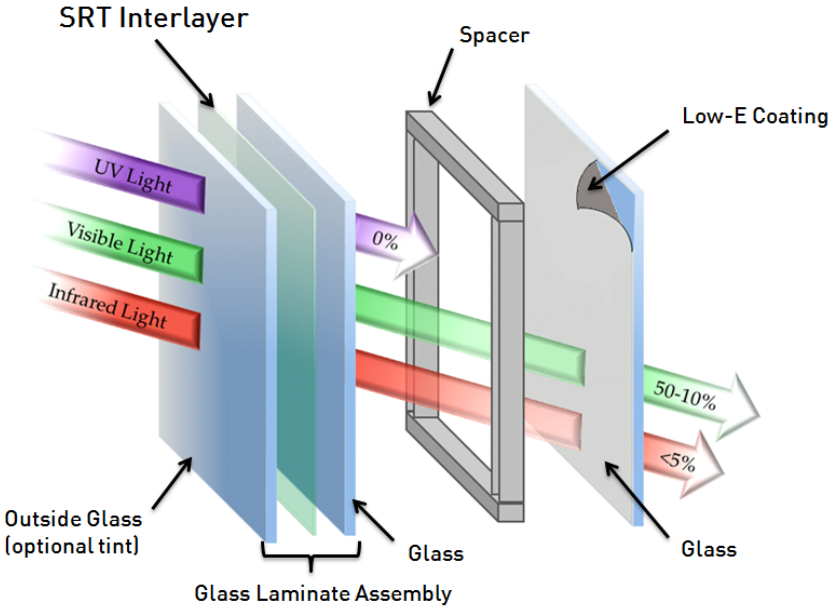


How SRT technology works in a low-e IGU

This diagram shows Solar Responsive Thermochromic (or Adaptive Glazing) Technology in a low-e IGU configuration.

The active ingredient is the SRT (PVB) Interlayer, it is not a coating or after-market product. When the sun hits the surface it is able to block UV and Infrared light whilst allowing a VLT of 10-50% depending on position of the sun as shown on the previous diagram.

This ability to adapt is reported to result in a 20-43% annual energy bill savings[1], with a 15% reduction in air-conditioning loads at peak demand times[2]. Not to mention occupant comfort and health benefits from being able to block the negative aspects of the sun without compromising visibility and natural light. This also means increased productivity and other less tangible savings.



Self-tinting in action

Images taken from the inside of a cafe show how the SRT glass is at its regular clear state in the morning. Then in the afternoon the windows receiving direct sun are at their darkest tint which return to clear at night. At full tint, the glass is dark from the outside looking in whilst still allowing natural light into the room and not obscuring the view from the inside out. There is no comparison between this and using blinds and its not hard to imagine the comfort benefits for patrons/staff when the sun's harsh heat is blocked and room temperature kept under control without excessive air-conditioning.

Glass for people

To achieve similar thermal comfort and sun blocking ability would require blinds, overhangs and permanent dark tints which not only add to costs but compromise natural light and the view. SRT glass is a glass for people, it promotes health and well-being of occupants by providing them with a connection to the outdoors, natural light and blocking the harshness of the sun as necessary.

SRT glass will:

- ✓ Increase comfort
- ✓ Optimise daylight
- ✓ Reduce solar heat gain
- ✓ Reduce noise
- ✓ Preserve the view
- ✓ Increase health & well-being of occupants

Glassworks' Suntuitive® SRT glass teams up perfectly with the best low-emissivity glass on the market, LoE-366®, to produce unprecedented performance figures as shown below

	Regular low-e IGU	SolarAdapt™ + LoE-366®	
	6mm clear 12mm Argon 6mm clear	8.5mm SolarAdapt 12mm Argon 6mm LoE-366	
Outside Glass Temp		10°C	65°C
VLT	73%	54%	11%
SHGC	0.67	0.32	0.13
U-Value	1.60	1.63	1.63

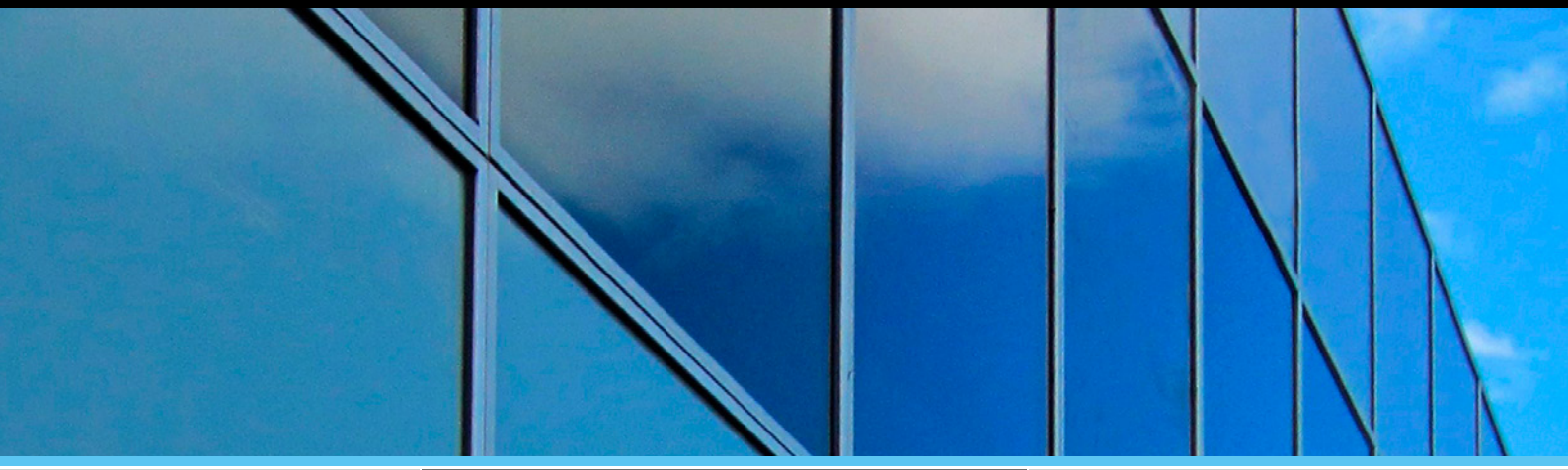
*Calculations based on Windows 7.2 NFRC 100-2010 conditions

REFERENCES

[1] "Lawrence Berkeley National Laboratory (2006), 'Advancement of electrochromic windows'

Webinar - Optimizing Daylight with Dynamic Glass ‹http://www.suntuitive.com›

[2] Chad Simkins (2016) "Webinar - Optimizing Daylight with Dynamic Glass" *Vice President, Pleotint*, LLC



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