



3M



Global + Speed
+ *Innovation*

Window Film Solutions for Architects, Building Owners, Facility Managers and Major Tenants



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3M Building & Commercial Services Division

Lend Lease Retail

*Issue; Heat Load through Glass Skylight in areas
of Shopping Centre*



Macarthur Square



Erina Fair



3M Prestige Sun Control Films

*prestige
window
films*

High Heat Rejection

Clear or Tinted versions available

High Natural Light Transmission

Low Reflectivity

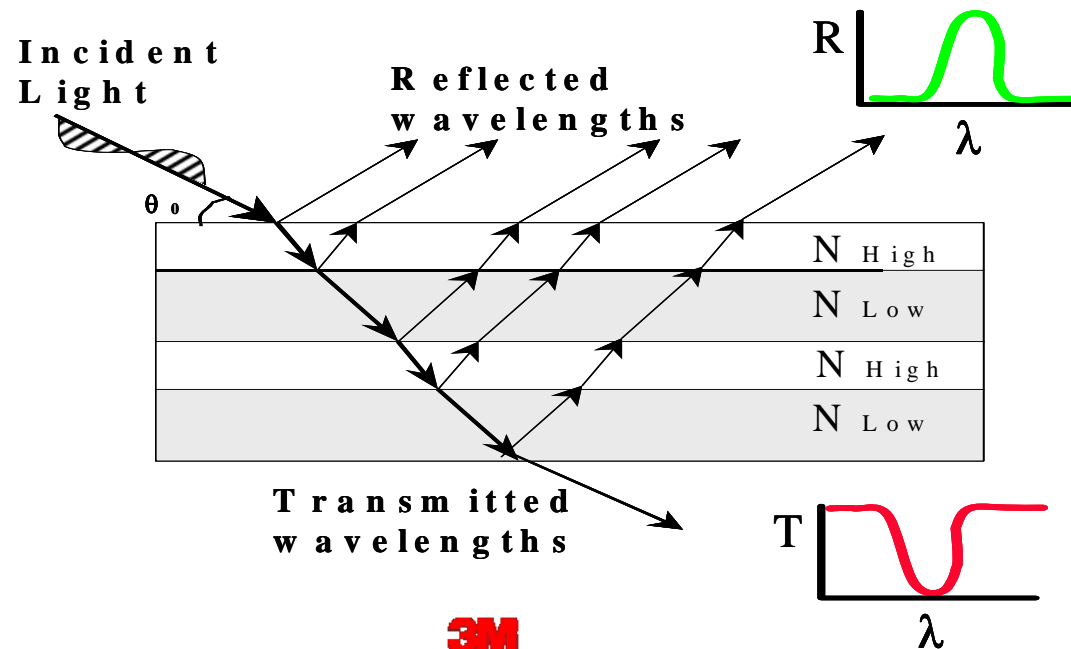
No metals

15 Year Commercial Warranty.

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Prestige Multi-Layer Optical Films

	VLT	TSER % 60° / 0°	Reflect Interior	Reflect Exterior	UV Reject
PR-40	39%	66 / 59	6%	7%	99.9%
PR-50	50%	63 / 56	7%	8%	99.9%
PR-60	61%	61 / 52	8%	8%	99.9%
PR-70	69%	59 / 50	9%	9%	99.9%



Macarthur Square; Campbelltown

Issue; Heat Load through Skylight in Old & New areas of Shopping Centre

Solution; 3M Prestige Solar Control Film



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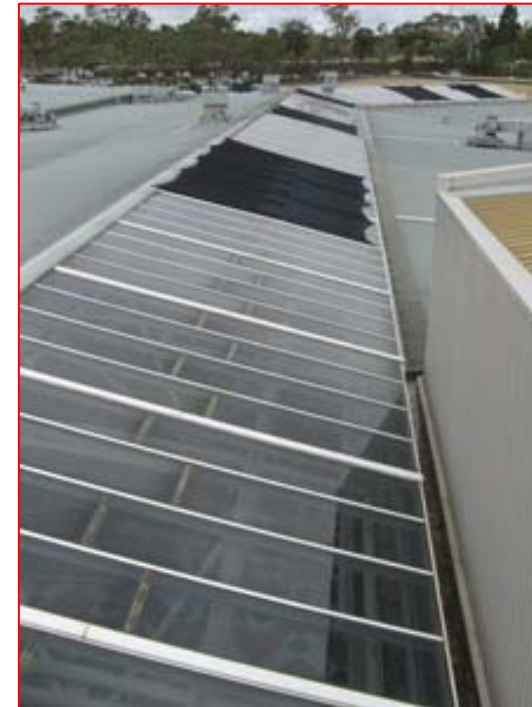
Heat Load Reduction; Macathur Square

- *Near Horizontal roof glass*
- *Access issues on to glass*
(Exposed Structural beams)
- *High glass in most areas*
(4-6 metres high).
- *Machine access for application*
(required & possible).



Solar Assumptions

- *Peak solar radiation intensity (SRI) taken conservatively as 1000W/m²*
- *Existing roof glass is clear glass with typical properties (i.e. Solar Heat Gain Coefficient (SHGC) = 0.82)*
- *Total area of glass to have film applied is;*
 - “Old Area” 1550m²
 - “New Area” 450m²
 - Total Area 2000+m²
- *No exterior shading (apart from limited areas)*



3M Prestige PR50 Properties

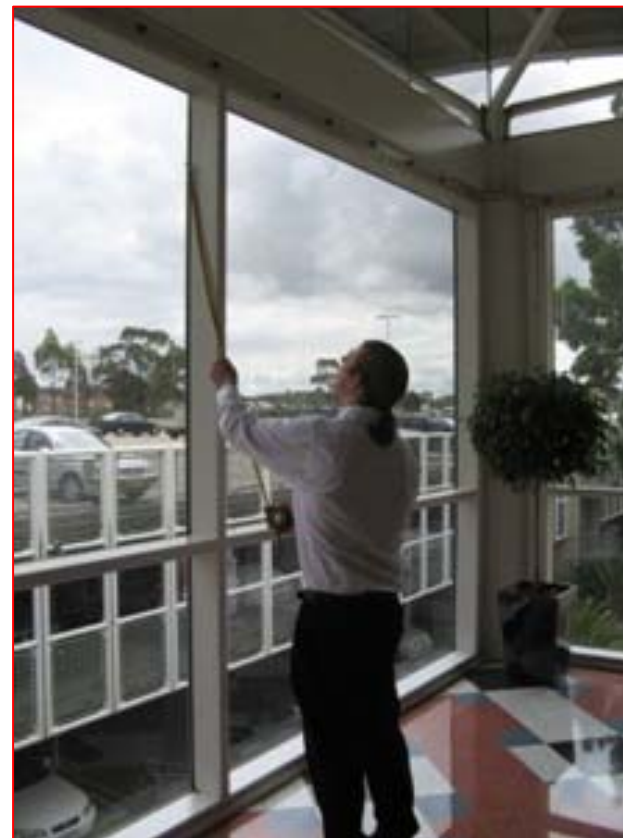
- *50% Visible Light Transmission*
- *99.9% UV Reduction*
- *97% IR Reduction (900-1100nm)*
- *56-63% Solar Energy Rejection*
- *0.44 Solar Heat Gain Coefficient*



Total Heat Load

- *Peak heat load Calculation*

$$\text{Heat Load} = \text{Glazing Area} * \text{SRI} * \text{SHGC}$$





Total Heat Load Reduction

- *For clear glass - Total 1640kW*
 - Old Area – 1271kW
 - New Area – 369kW
- *For clear glass with PR50 applied - 880kW*
 - Old Area – 682kW
 - New Area – 198kW
- *Total facility heat load reduction - 760kW*
 - Old Area – 589kW
 - New Area – 171kW



Total Heat Load Reduction

- *760kW*
 - Old Area – 589kW
 - New Area – 171kW

A Maximum rejection of 589kW per hour from around 11-3pm Daily for the “Old Mall” Area of Macarthur Square.

Thermal Stress on Glass

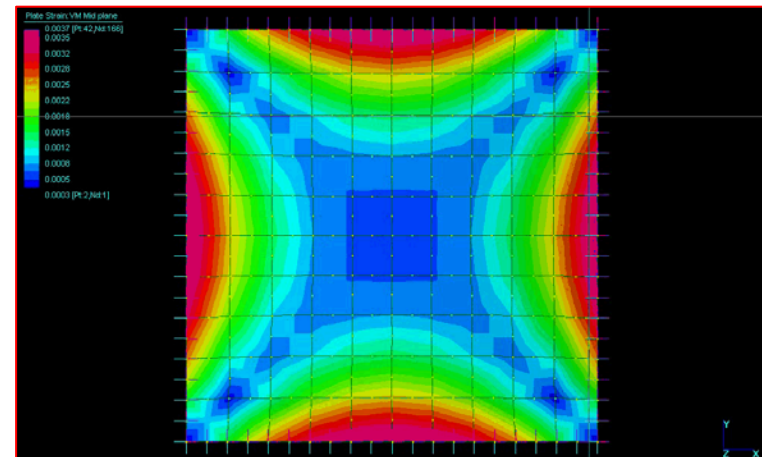
Internal solar control films place additional stress on the glass.

Absorption, reflection, external shading, Type of Frame, Structural pockets, Size, Angle of glass can all contribute.

This can create uneven temperature differences that can lead to stress failure.

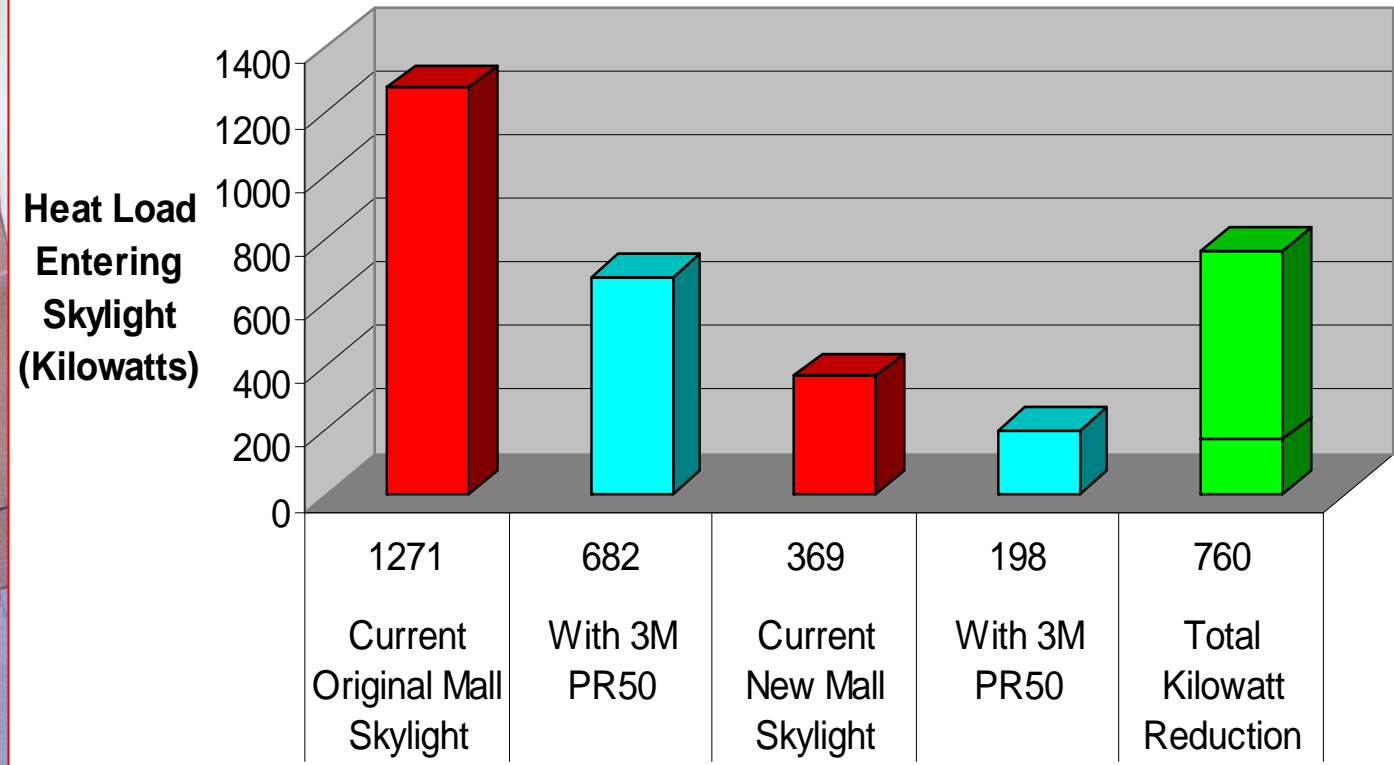
3M have a Glass Stress Analysis programme, however for applications on this scope with this glass we would look to engage a Façade Engineer to ensure no issue.

Before our Application proposal is accepted or application commence 3M would look to have a Glass Stress report commissioned. This cost would be around \$400-600.



Computer analysis of stress patterns

Heat Load Through Skylight; Macarthur Square



3M Sustainable Innovation & Technologies

3M Sun Control Window Films

Rejecting unwanted heat, allowing natural light



3M Light Enhancement Films (LEF)

Increased energy efficiency for internal lighting



3M Filtrete (HVAC)

High particle capture efficiency

3M Traction & Matting

Safety Walk & Matting – reduce Slips Trips & Falls

3M Commercial Care Products

