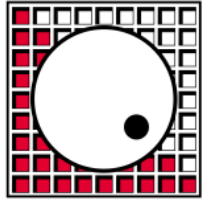


**NanoPore Insulation**

# **The Development of High Thermal Efficiency Panels for Glazed Facades**

**Mr Phil Deighton – NanoPore Insulation Ltd**  
**Mr Peter Smith – TuffX Processed Glass Ltd**

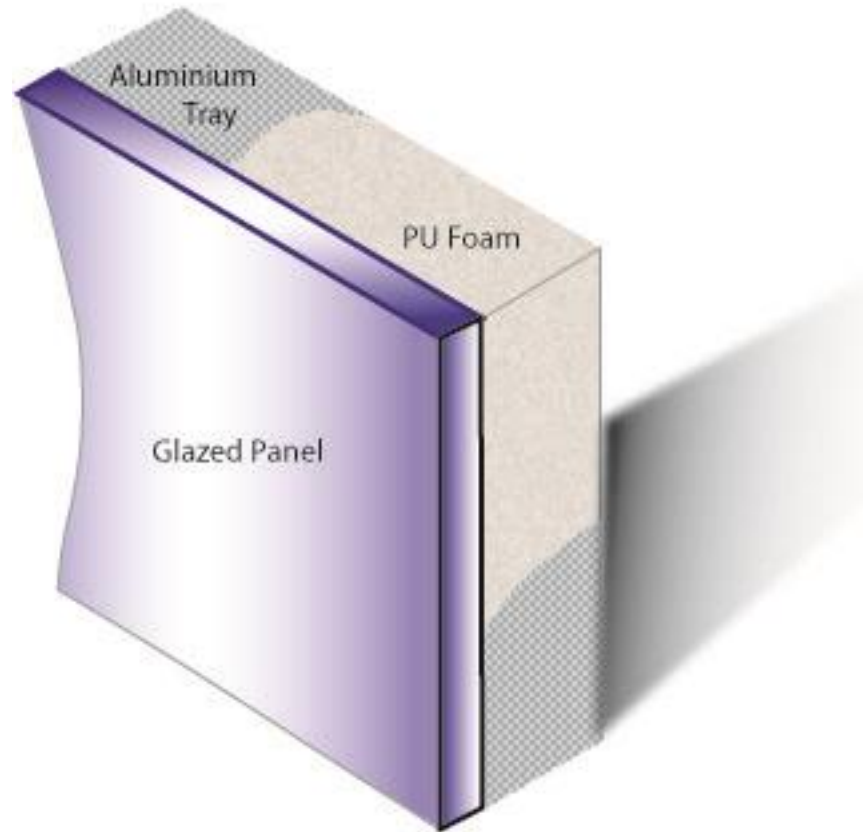


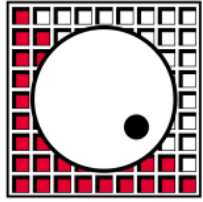


NanoPore Insulation

# Current System

Traditional insulated spandrel panels often consist of a double glazed unit with polyurethane insulation added to the rear of the panel.



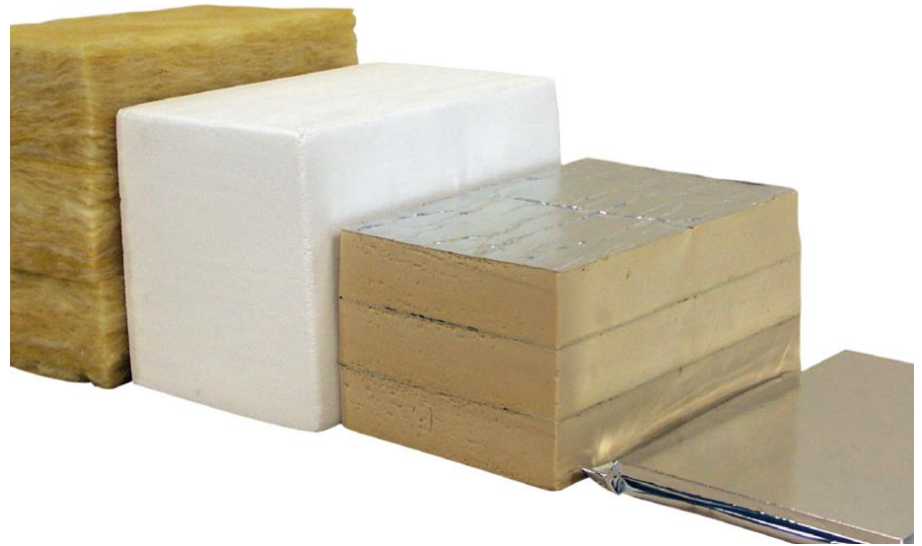


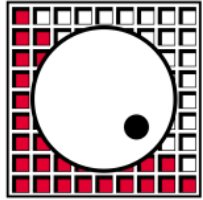
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# The Problem

With the move to lower U-values, insulation thicknesses are increasing dramatically.

To achieve a U-value of  $0.2\text{W/m}^2\text{ K}$  can require over 100mm of PU.

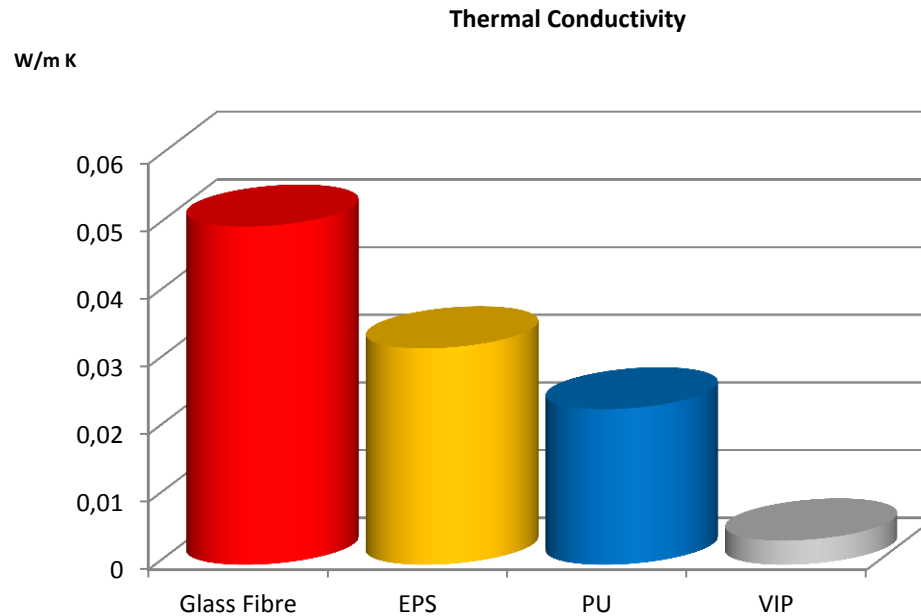


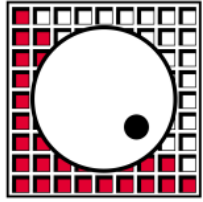


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# Improved Materials

The superior performance of VIPs is the basis of the eco-i panel manufactured by TuffX Processed Glass.

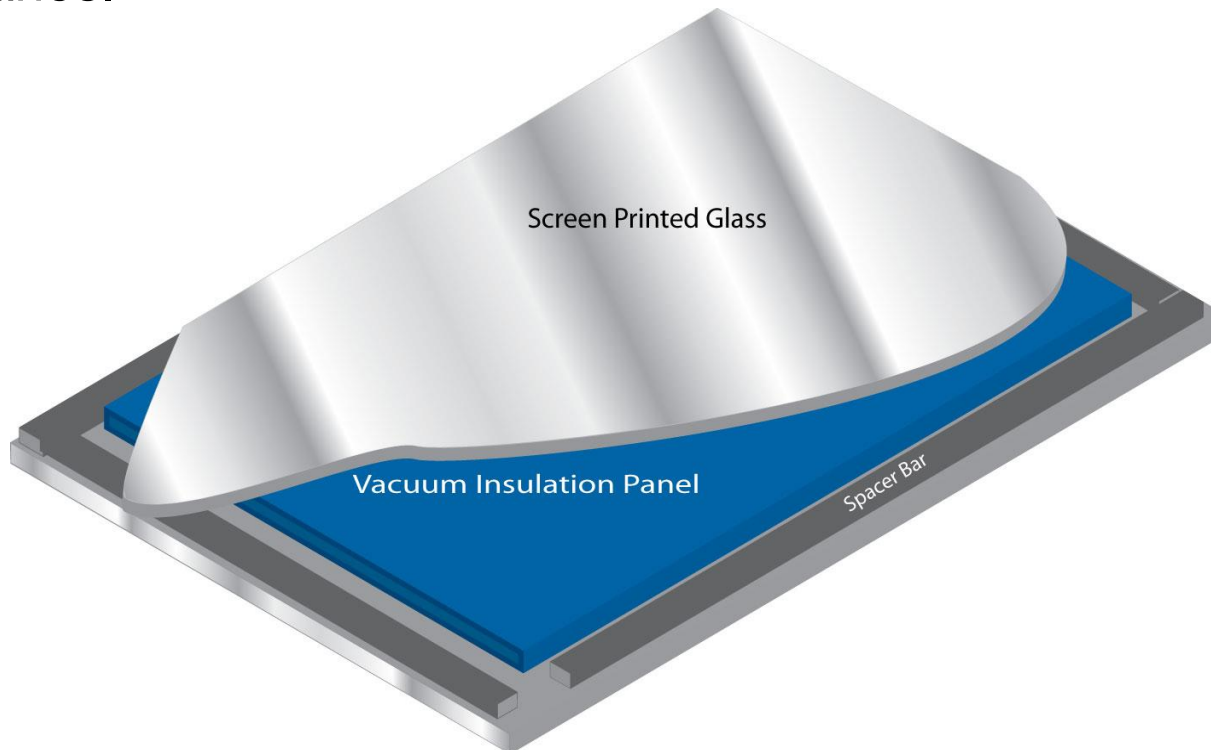


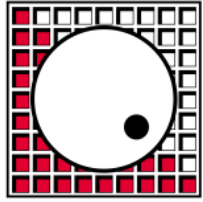


NanoPore Insulation

# Construction

- The eco-i panel is just like a traditional glazed spandrel panel.
- The insulation is provided by a VIP sandwiched between two glass panes.

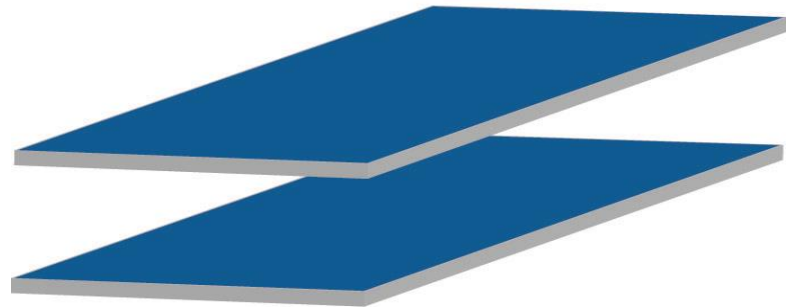
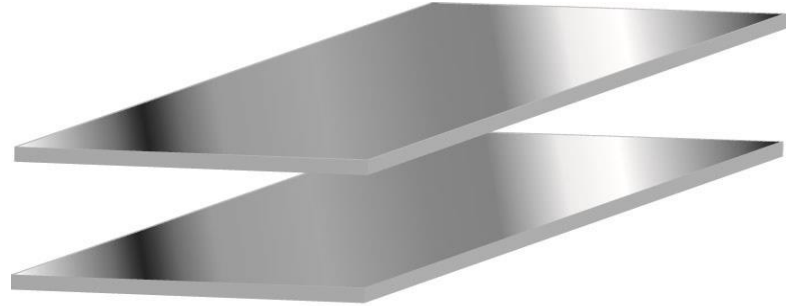




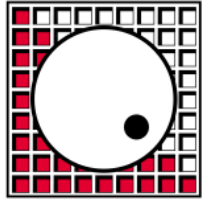
## NanoPore Insulation

- Each glass pane is screen printed on the internal surfaces using ceramic inks prior to being toughened.
- This process has been specially developed to prevent pin-hole effects in the coating and the ceramic inks do not suffer from UV degradation.

# Construction





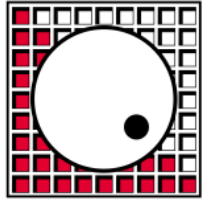


## NanoPore Insulation

- The VIPs are made to measure and fitted between the panes of glass.
- The unit is fitted with spacer bars and sealed.

# Construction





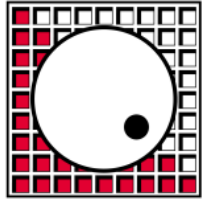
## NanoPore Insulation

- Installation methods are identical to those used for vision panels.
- Internal and external surfaces can look the same.

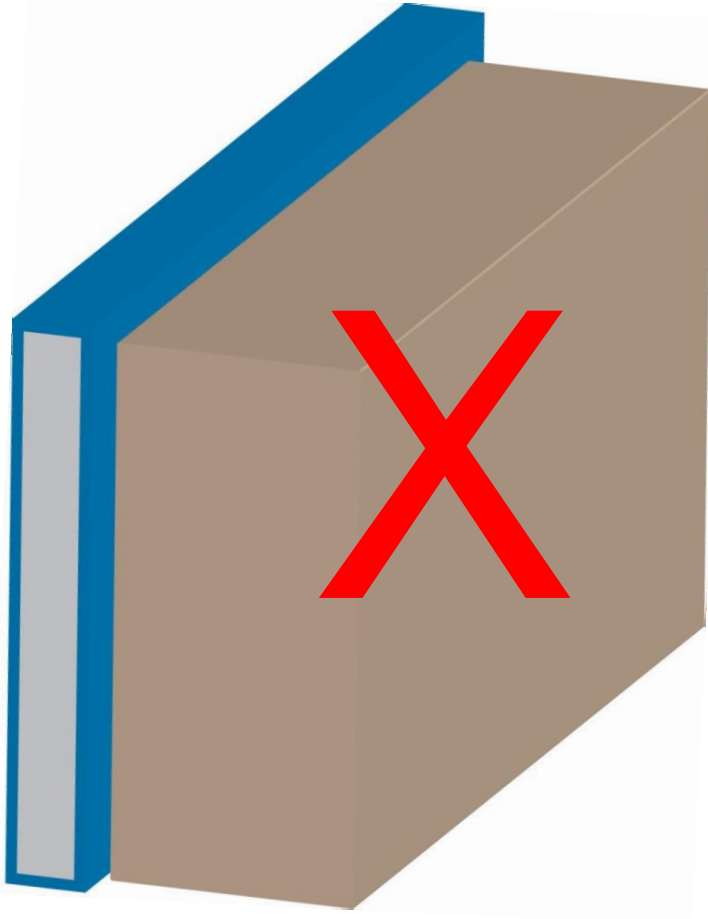
# Advantages







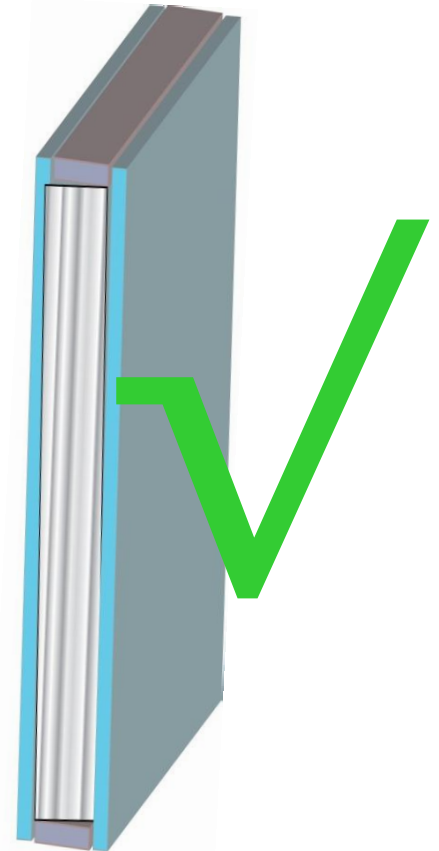
NanoPore Insulation

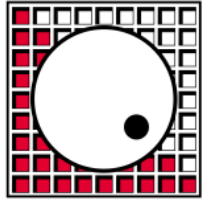


# Advantages

A U-value of less than  $0.2 \text{ W/m}^2 \text{ K}$  can be achieved within a 28mm unit.

The extra thickness of insulation on the back of units is eliminated.

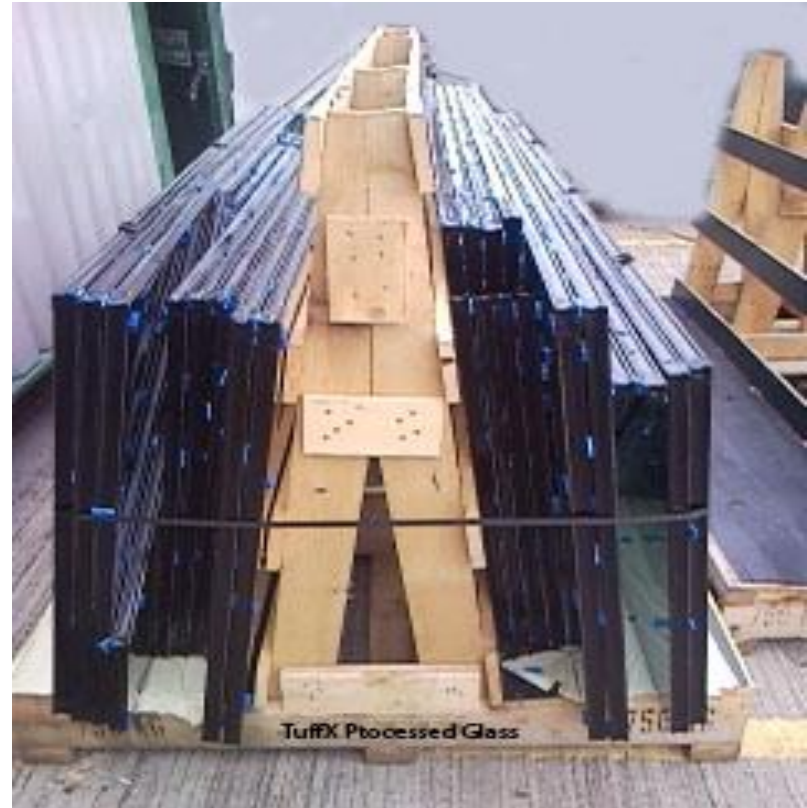


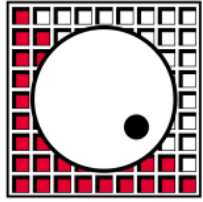


## NanoPore Insulation

- Transport costs are greatly reduced.
- Insulation is not liable to transit damage.
- No need to make good by adding secondary facades internally.

# Advantages

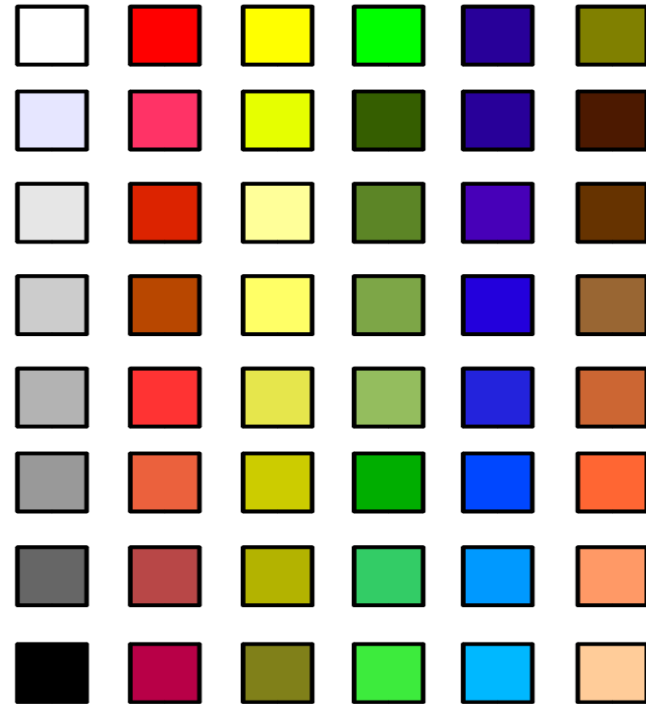


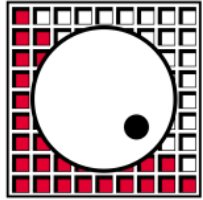


## NanoPore Insulation

- Printing available in standard RAL colours.
- Spandrel panels also available with aluminium or laminate facings instead of glass.

# Available Options

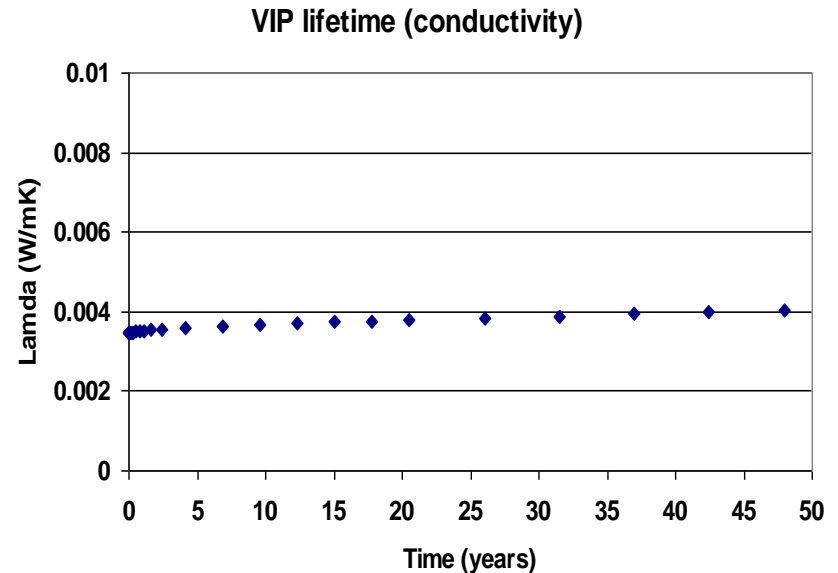


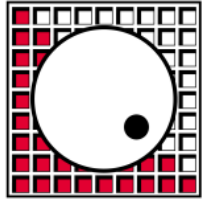


## NanoPore Insulation

# Theoretical Lifetime

Data from the barrier film manufacturers would indicate that the predicted lifetime for VIPs is over 60 years.

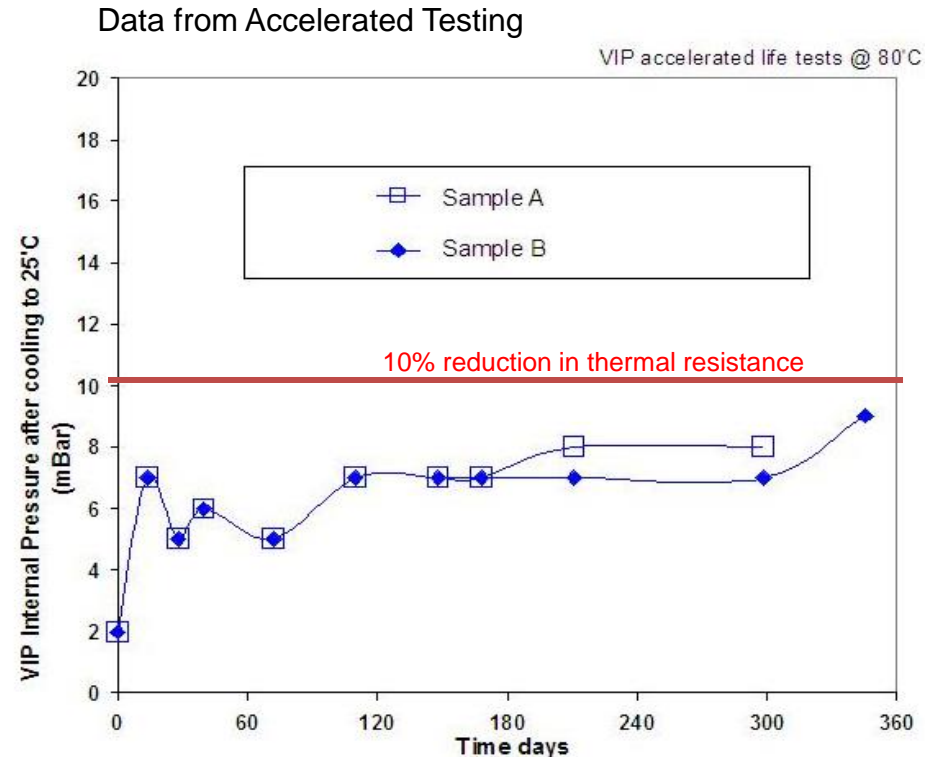




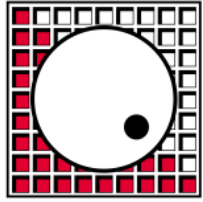
## NanoPore Insulation

# Realistic Lifetimes

- However, forming the film into a panel can affect its lifetime.
- Accelerated tests of actual VIPs predicts a minimum of 20 years for a 10% reduction in thermal resistance.
- This is in line with the expected performance of comparable systems.



Equivalent time at ambient (Years) ----- 5 ----- 10 ----- 15 ----- 20



## NanoPore Insulation

- VIPs are great for this application because they can give the required thermal properties with only thin sections.
- They are protected from mechanical damage within the glass envelope.
- VIP lifetimes in line with those of alternative systems.
- Installation is easier and more cost-effective than alternative systems

# Summary

