ALPEN
CLEAR PERFORMANCE

Proven **RESULTS**

- Warmer winter-time glass surface temperature increased as much as 18°
- Improved UV light blockage protects both health and belongings over original glass
- Reduced inbound solar heat gain by 52% for increased savings and comfort

For nearly three decades, Alpen HPP has successfully installed millions of square feet of Suspended Film architectural glass and windows.

Alpen HPP has been tested and IGCC certified for both polyurethane and silicone sealants for the past 27+ years. The extensive IGCC testing includes: 2 weeks of high humidity; 9 weeks of accelerated weathering, high temperature, UV exposure, and low temperature; 4 weeks of high humidity; and volatile fogging tests.

The design and longevity of Alpen HPP's Suspended Film glass packages is undeniable.

Advantages of Insulated Glass with Suspended Film

The U.S. Department of Energy estimates that despite heavily insulated walls and ceilings, 25 to 35 percent of the energy used in American buildings and homes is wasted due to inefficient windows and glass.

The DOE's Energy Star program has promoted energy efficient windows equipped with low-e glass for more than 10 years. Low-e glass coatings reflect heat thereby reducing the heat transfer between the panes of glass and improving the glass insulation performance. Insulating performance of glass and windows is critical to architects, building owners, and other trusted partners in designing the most energy efficient buildings.

To understand how glass in the modern era can save even more energy, it is necessary to look at the recent advancements made in window and glass design.

The transition from single pane glass to dual pane (with a single cavity) provided an improvement in energy performance. In much the same way, the introduction of multiple-cavity glass packages – with two to three insulating cavities and multiple surfaces – allowed for significant improvements in the energy savings and performance of windows and glass.

The alternatives to single-cavity insulating glass exist that meet or exceed Energy Star requirements: triple-pane glass and Suspended Film. Suspended Film glass packages demonstrate significant cost and performance advantages over triple-pane glass systems.

Triple-Pane Glass

Triple-pane glass consists of three panes of glass and two low-e coatings. Using a third pane creates a second insulating cavity. Gas is used to fill the insulating cavity to slow the transfer of heat or cold air through the window. Triple-pane low-e glass improves generic low-e insulating glass, raising the insulation value from R-4 to up to R-9. However, triple-pane glass units are 50% heavier than standard insulating glass. The heavier glass requires stronger framing systems which will increase the overall cost of any building project. The extra weight can also impose strict size constraints and may affect how much glass is used in the design of a building -- impacting the overall aesthetics of a structure. General functionality of triple-pane windows is also affected by their weight. Additional stress is placed on all operable mechanisms in the window and the window hardware, wearing them out quicker.

Issues with Triple-Pane Glass

- Increased project costs (more labor, sturdier frames, stronger building design)
- 50% heavier than standard insulating glass
- Aesthetic and design limitations due to size constraints imposed on the glass and
- window units
- More stress on frame potentially creating gaps that will allow air, water and
- dust infiltration
- Amount of natural light in the overall design may be reduced
- Additional stress on operable portions of the window and window hardware
- Wider glass packages may not fit framing systems or window openings

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Suspended Film Insulating Glass

Suspended Film is one of several technologies for insulating glass. It is the most signicant and critical to improving insulation and achieving higher performance - without any of the design limitations typical of triple-pane systems.

Internally mounted low-e films complement the benefits of low-e glass. Combining both film-based coatings and glass-based coatings creates a lightweight, multi-cavity insulating glass unit that reflects heat and harmful UV radiation while maximizing light transmission. It provides superior insulation performance.

The glass and films of Suspended Film packages are separated by thermally insulated spacer systems that improve the insulating performance to the edge of the glass unit. A variety of inert gases can also be used to fill the air spaces to further block heat transfer.

Benefits of Alpen HPP Insulating Glass Units:

- HVAC savings due to downsized equipment and lower annual operating costs
- Directional tuning to enhance daylighting with morning warmth and afternoon coolness
- 99.5% UV protection -- reduces interior fading and damage
- Improved occupant comfort and health
- Architectural freedom to include more glass in the design
- Reduced condensation
- Lower project costs when compared to triple-pane glass
- Potential elimination of perimeter baseboard heating
- LEED contribution of up to 19 points

Features of Alpen HPP Insulating Glass Units:

- Super-insulating glass packages with 2 to 3 air spaces (triple or quad glazings)
- R-values up to 9.1
- Wide range of glass packages - SGHC from 0.21-0.60, VT from 39-70% and Light/Solar Gain (LSG) from 1.2-2.4
- Less weight – no need for specialized framing systems
- Dual seals around the edges of glass unit
- Long lasting glass units that weigh the same as typical double pane insulated glass
- Larger air spaces than triple-pane glass in the same glass pocket for signicantly better thermal performance
- Choice of glass packages to meet your design needs

Low-E Coatings

Low-E coatings are microscopically thin, virtually invisible, metallic oxide layers that are applied to the glass surface or suspended film in an insulated glass unit.

The coating works by reflecting heat back to its source. In the winter, the heat is reflected into the building and in the summer, heat is reflected outside.

Low-E coatings are unique in that they can block long-wave infrared heat and UV rays without preventing visible light from passing through the various layers of an insulated glass unit.

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