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Vacuum Insulated Glass Gains Momentum as Retrofit Demand Accelerates in North America and Europe

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Vacuum Insulated Glass (VIG) is emerging as a critical technology in the transition toward low-carbon, energy-efficient buildings, as governments across North America and Europe tighten performance standards and accelerate large-scale retrofit programmes.

With existing buildings accounting for a significant share of energy consumption, upgrading building envelopes—particularly windows—has become a priority. However, traditional double and triple glazing systems often present challenges in retrofit scenarios due to their thickness, weight and structural requirements.

VIG offers an alternative approach, combining high thermal performance with a significantly slimmer profile. By incorporating a micro vacuum gap between two panes of glass, the technology minimises heat transfer caused by gas conduction and convection. When paired with advanced Low-E coatings, VIG can achieve U-values in the range of 0.4–0.7 W/m²K, comparable to or exceeding conventional triple glazing systems.

At the same time, units typically measure just 6–8 mm in thickness, allowing them to be installed within existing window frames without major structural modification. This makes the technology particularly suited to retrofit projects where disruption, cost and preservation constraints are key considerations.

Addressing retrofit constraints

Retrofit projects—especially across historic buildings, dense urban housing and ageing commercial assets—require solutions that balance performance with practicality. VIG's lightweight, ultra-thin design enables upgrades without increasing structural load or requiring frame replacement.

Its compatibility with existing systems also reduces installation time and disruption, offering a more viable pathway for large-scale upgrades across markets such as the United States, Canada, the United Kingdom and Germany, where energy retrofit policies are being actively enforced.

Supporting regulatory compliance

As net-zero targets and stricter energy codes take hold, building owners and developers face increasing pressure to improve performance. VIG provides a route to compliance by reducing heat loss, supporting energy certification standards and contributing to broader carbon reduction goals.

This shift is moving VIG from a niche innovation toward a more mainstream solution as regulatory requirements tighten.

Integration and expanding applications

Beyond standalone use, VIG is increasingly being integrated with other advanced glazing technologies, including multi-layer Low-E coatings, laminated safety glass and smart glazing systems. This expands its use across high-performance façades, curtain wall systems and premium residential and commercial developments.

Market outlook

Industry data suggests the global VIG market is entering a period of accelerated growth, driven by rising demand for energy-efficient building solutions and the expansion of green construction initiatives.

While challenges remain—particularly around cost, manufacturing scale and long-term vacuum stability—ongoing technological development is improving commercial viability.

HaanGlas, one of the companies active in the space, is focused on delivering VIG solutions tailored to retrofit and energy-efficiency projects.

"Our goal is to bridge the gap between performance and practicality," said a representative Han from HaanGlas. "We understand the real challenges faced by contractors, window manufacturers, and developers in retrofit projects, and we design our VIG solutions accordingly."