# Five Years of GUARDIAN GLASS Hybrid Vacuum IG™ Success

**Enhancing its solutions for energy efficiency and acoustic insulation, GUARDIAN GLASS has introduced its Hybrid Vacuum IG™ windows in the Boulder Community Health Center West Medical Building in Colorado. A pilot installation, it demonstrates the advanced performance of Vacuum IG technology, offering superior thermal insulation and noise reduction. Now, five years after installation, the windows have proven highly effective in supporting sustainability in healthcare construction.**

Located in the evolving area of East Boulder County, Boulder Community Health Center West Medical Building in Lafayette, Colorado is home to an eye clinic and surgical centre. Of these the latter consists of two operating rooms and an area for retinal laser procedures. The building can accommodate 4-5 medical practices. Hard at work attending to their patients, the occupants are likely unaware of the extent to which their professional space is a valuable location for an important advancement in building construction: Vacuum insulated glass (VIG) technology. Indeed it is Guardian Glass' collaboration with Boulder Associates that led the architecture firm to specify 318 Guardian Hybrid

Vacuum IG™ windows for the nearly 30,000 surface 1 facility. Completed in 2019, it was the first new construction project to install Guardian Hybrid Vacuum IG windows, which combine the performance of Vacuum IG and the additional benefits of a traditional insulating glass unit (IGU).

## BRAVING A HOSTILE ENVIRONMENT

This area of Colorado is known for significant temperature fluctuations and abundant sunshine. Combined with the architect's commitment to environmental stewardship, that meant Boulder Associates had a unique challenge to balance the two - making this project an ideal test site for an innovative, energy-efficient design. To align with the client's goals of stable interior temperatures and year-round energy efficiency, the architect collaborated closely with the Guardian Glass team

during this pilot project for the energy-efficient glazing prototype.

## HOW VIG WORKS

Standard Vacuum IG™ design seals two glass panes airtight, creating a vacuum in the space between the two panes. Guardian Hybrid Vacuum IG combines the performance of Vacuum IG with the additional benefits of a traditional IGU. With no air or gas between the panes, heat and cold have no medium by which to transfer, helping the unit deliver performance that exceeds a typical IGU2:

- Thermal:
  While a double pane Vacuum IG unit with a second-surface low-E coating -also known as a Hybrid Vacuum IG- has an R-value of around R-4, Hybrid Vacuum IG that incorporates a second low-E coating boasts an impressive R-16 - making its overall insulation comparable to that of a wall.
- Acoustic:
  Outdoor-indoor transmission class (OITC) is the typical measurement used to account for acoustic performance of an exterior facade as it emphasises acoustic performance in the low- to mid-frequency ranges (i.e. noise from aircraft, trains or automobiles). The higher the OITC rating, the greater the sound resistance the glazing will offer. In a typical thermally broken aluminium window system, the OITC improves from 26 for a double pane IGU to 31 for the same window system with hybrid Vacuum IG.

## IMPROVING SPACES DESTINED TO HEALTHCARE

The architect specified Guardian Hybrid Vacuum IG windows for the building because of the product's superior thermal insulation performance. Reducing the transfer of heat or cold through the glass helps deliver stable room temperatures and better energy efficiency to the building as compared with standard double IGU configurations. Guardian Hybrid Vacuum IG units also deliver sound insulation to help contribute to a quiet indoor environment that remains unpolluted by external noise. The Guardian Hybrid Vacuum IG units for the Boulder Community Health Center West Medical Building feature Guardian SunGuard™ SNX 62/27 low-E coating on surface 4. SunGuard SNX 62/27 low-E coated glass helps the building achieve energy-saving performance while balancing light transmission and reflectivity. The south, west and east elevation units also have SunGuard SNX 62/27 coating on surface 2 to further support the building's energy efficiency.

## FIVE YEARS IN PEOPLE PREFER A WINDOW SEAT

Five years after installation, each window was evaluated with thermal imaging equipment. The Guardian Hybrid Vacuum IG surface temperature was 5°F (2.8° C)

## PROJECT DETAILS

Name: Boulder Community Health Center West Medical Building
Location: Lafayette, Colorado

Companies
Architect: Boulder Associates
Glazier: Steel City Glass LLC

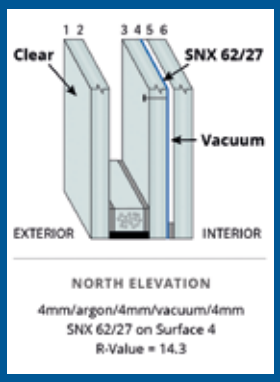
Glazing Solution
Guardian Hybrid Vacuum IG™ glass4 with Guardian SunGuard™ SNX 62/27 coated glass

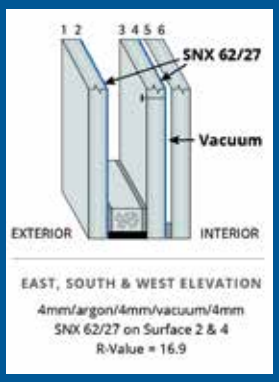
Footnotes
1. There are windows on the building that are not composed of Guardian Vacuum IG. That includes the corner windows that are butted together, glass doors and any window that were broken and replaced.

2. Typical IGU makeup: The commercial construction standard in North America is a 1" insulating glass unit that consists of two ¼" lites of glass separated by a ½" Argon cavity.

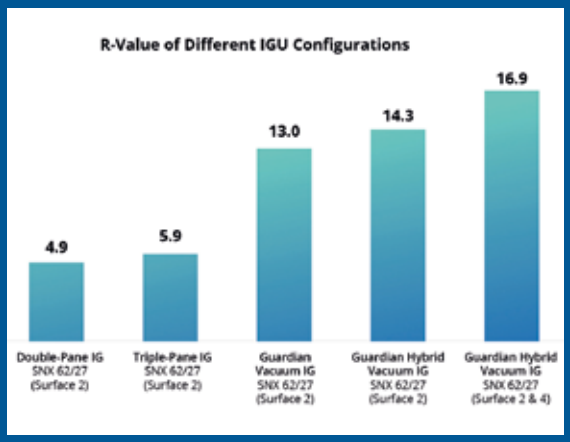
3. Embodied carbon claims are based on comparing glass components of a 6mm/4mm/4mm Vacuum IG hybrid versus the glass components of a 6mm/6mm/6mm triple IG. A Vacuum IG with 4mm glass can be used in place of a triple IG with 6mm glass due to the Vacuum IG's enhanced mechanical strength.

4. Guardian Vacuum IG and Hybrid Vacuum IG units are certified by the Insulating Glass Certification Council (IGCC) confirming the long-term durability of both products. (IGCC #4909, #4910). Guardian Hybrid Vacuum IG units for this project were produced in a Guardian Glass pilot facility.

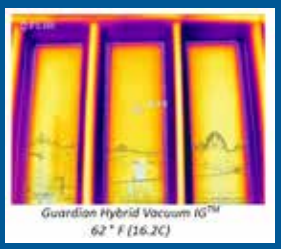



The IG configurations on the Boulder Community Health Center West Medical Building, featuring Guardian Hybrid Vacuum IG™ windows with Guardian SunGuard™ SNX 62/27 low-E coating.




Thermal performance of Guardian Hybrid Vacuum IG™ products compared to other glazing options for Guardian SunGuard™ SNX 62/27 low-E coating. Glass thickness for all options is 4mm. Double pane, triple pane and hybrid options include a 12.7mm spacer with argon.





Inside temperature of a Guardian Hybrid Vacuum IG™ unit and a traditional double pane unit installed after the original Hybrid Vacuum IG window was vandalised. Images taken at 6:30 am, overcast, 33°F (0.6° C) outside temperature. Inside temperature was 64°F (17.8° C) in unoccupied space.

warmer than the traditional IG (interior temperature of the building was 64°F). Analysis of all the windows in the building revealed that one of the Guardian Hybrid Vacuum IGTM units failed, giving the installation a 99.7 percent success rate (314/315), which is consistent with traditional IG installations. When analysed, the failed Vacuum IG had a diminished insulative performance comparable to the traditional IG but did not completely lose its vacuum.

Property manager and occupant interviews revealed the employees were very pleased with their comfort levels regarding temperature and acoustics:

- Employees noted their offices were remarkably quiet, despite the building's location adjacent to a busy road.
- Workstations by the windows were highly sought-after.
- The property manager had not received any complaints related to the performance of the windows, compared to complaints from nearby buildings where draft affected occupant comfort.
- No one commented on noticing the microspacers characteristic of vacuum insulated glass.

Says Guardian Advanced IG Product Manager for the Americas, Jason Blush: "This building really showcases the combination of Guardian Low-E coatings to minimise thermal radiation and Vacuum IG for insulation performance in a high desert climate like Denver."

## THE NEXT FRONTIER: TEMPERED VIG

"Having been available for over two decades, vacuum insulated glass has established its presence in the market; however, the advent of tempered VIG marks a revolutionary shift," says Blush. "The thermal performance of tempered VIG, offering R-values twice that of its non-tempered counterpart, coupled with its enhanced strength, paves the way for its application in the commercial sector. This technology is poised to help reduce energy consumption and concurrently diminish the operational and embodied carbon footprint of the built environment."

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