# CASE STUDY: LUMIRA® THE BENEFITS OF DIFFUSED LIGHT

## AN ALTERNATIVE TO TRADITIONAL GLAZING

Despite the many benefits of bringing daylight into a space, it can often be hard to overcome the common downfalls of glazing systems. The low thermal performance of glazing systems reduces the overall efficiency of the building envelope, increasing the running costs of a HVAC system. Glazed surfaces also permit the transfer of exterior sound to interior spaces, potentially

ruining the tranquility of an intentionally quiet or relaxed space. If imprudently placed, glazing may reveal undesirable views or allow glare or uneven lighting to ruin the functionality of an interior space.

These drawbacks can be remedied through the use

of Lumira<sup>®</sup>. Lumira<sup>®</sup> is a lightweight insulation and daylighting solution that utilizes semitransparent aerogel to offer high thermal performance, reduced solar heat gain and loss, 75% natural light transmission, and ideal sound absorption and retention. Made of a dry silica particulate, Lumira<sup>®</sup> aerogel is completely recyclable, eco-friendly, and non-combustible.

Lumira<sup>®</sup> can be installed in any skylights, roof lights, smoke vents, glass roofs, windows, tensile structures, and fabric roofing that utilize composite panels, polycarbonate systems, polycarbonate faced systems, U-channel glass, or insulated glass units. Lumira<sup>®</sup> offers many benefits for those looking toward their next renovation or construction project.

## **RENOVATIONS AND ADDITIONS**

Anyone living with an existing, antiquated glazing system will see the potential offered by Lumira<sup>®</sup>. The intrinsic thermal performance and reduced solar heat transfer of Lumira<sup>®</sup> surpasses that of traditional glazing, making it a superior option when considering a renovation or addition. The exceptional thermal performance lowers heating and cooling loads, which translates into money

savings and a significantly reduced carbon footprint. Lumira<sup>®</sup> will distribute evenly diffused light throughout a space, preventing glare and reducing hot and cold spots associated with direct sunlight. It can be strategically placed to absorb and retain noise or block undesired views while preserving the benefits of daylight.



A CLASSROOM SETTING DEMONSTRATING UNDIFFUSED LIGHT (TRADITIONAL GLAZING) VERSUS DIFFUSED LIGHT (LUMIRA®)





LUMIRA® AEROGEL BEADS



CASE 1. LUMIRA® VS TRADITIONAL GLAZING

From a construction standpoint, Lumira<sup>®</sup> allows for a less invasive renovation than traditional glazing systems because of its lightweight and flexible nature. This flexibility is likely to prevent substantial changes to existing curbing or framing during renovations.

In **Case 1**, an office space utilized Lumira<sup>®</sup> during a renovation. The office was looking to preserve daylighting offered through southern exposure, but sought to prevent the associated glare on computer monitors. The window glazing was replaced with Lumira<sup>®</sup> and the office workers now enjoy evenly distributed lighting without productivity-reducing glare.

### **NEW CONSTRUCTION**

If integrated strategically in the design phase of new construction projects, Lumira<sup>®</sup> can significantly improve the overall quality of a completed building. The thermal performance that lowers the heating and cooling loads, saves money, and reduces carbon footprints also helps in gaining or maintaining LEED credentials. Lumira<sup>®</sup> is also free of volatile organic compounds (VOCs), even when exposed to UV rays, maintaining a healthy environment for occupants.

In much the same way that glazing can be used to frame views, Lumira<sup>®</sup> can be used to block undesirable views without obscuring natural light. Similarly, Lumira<sup>®</sup> can be used to prevent glare, particularly glare associated with Western facing glazing. The lightweight properties of Lumira<sup>®</sup> make it an adaptable, easy-to-install material. It can be used in a wide range of residential, commercial, educational, and institutional applications. In **Case 2**, Lumira<sup>®</sup> was utilized in a manufacturing plant. In order to lower the cost of lighting without sacrificing thermal efficiency to traditional glazing, this manufacturing plant was designed with skylights equipped with Lumira<sup>®</sup>. The finished space promotes evenly distributed light, a thermally efficient roof, and benefits from lower operational expenditures on lighting and HVAC.

### **REAPING THE BENEFITS OF LUMIRA®**

As evidenced in the preceding cases, Lumira<sup>®</sup> offers a wide range of benefits and design potential. Lumira<sup>®</sup> can find a place in nearly any project from renovations to new construction. It only takes strategic placement for a building to reap the plethora of benefits associated with Lumira<sup>®</sup>.



CASE 2. LUMIRA® IN A MANUFACTURING SPACE LAYLIGHT