

Natural Lighting

Daylighting Systems Deliver Measurable Benefits Across Building Types

■ By Plain Builder Staff

There are many reasons for using daylighting systems: reduced energy usage, cost savings, the effect of natural light on the aesthetics of a space, and the mood-brightening many people experience. There are, however, even greater benefits depending on how the space is used.

People experience improved cognition and recuperation times when exposed to natural light, said Neall Digert, Ph.D., MIES, Vice President of Innovation and Market Development, Kingspan Light + Air North America. Daylighting has also been shown to reduce the need for painkillers, he added. Naturally, these are strong reasons to incorporate daylighting into health care settings.

The benefits translate well to schools and offices. The visual cues of daylight affect both human psychology and physiology, resulting in happier students and employees who often experience increased productivity throughout the day.

In retail settings, the benefits extend beyond employee well-being to customers, who tend to have a more positive in-store experience and trust that the color of the apparel they're viewing will remain the same once they leave the store.

Institutional and civic buildings, convention centers, sports arenas, manufacturing facilities, and warehouses—any building where people spend time—can benefit from natural daylighting. Residences, both single-family and multi-family, can also be dramatically improved with natural lighting.

Daylighting is also closely aligned



Solatube natural lighting tubes incorporated into a living roof system.
PHOTO COURTESY OF KINGSPAN LIGHT + AIR NORTH AMERICA

with the values of many plain-clothes communities, who emphasize simplicity, stewardship, and a natural approach to daily living. These communities often prefer natural light because it reduces dependence on electrical systems, supports energy efficiency, and maintains a calm, consistent indoor environment. For many, natural illumination is both practical and consistent with long-standing cultural values that prioritize modesty, resourcefulness, and a close connection to the rhythms of the natural world. Daylighting systems that eliminate UV exposure and reduce heat gain can support these preferences while providing balanced, reliable illumination for reading, handcraft work, and everyday tasks.

That said, many would point out that

windows offer similar benefits. However, it is not that simple.

Contrary to what one might think, the benefits discussed here have nothing to do with improved vitamin D levels. Vitamin D is produced in the skin when exposed to ultraviolet (UV) light; however, UV can also lead to health problems, specifically skin damage. UV light also tends to fade colors, so daylighting systems like Solatube filter UV out of the light entering a building. Instead, it is the tuning of spectral content that leads to improvements in cognition, neural energy, and mood, according to Digert.

Tubular daylighting selectively captures sunlight, stripping it of ultraviolet light and heat. It redistributes this filtered light by redirecting it much like a duct guides

air through a structure. The reflective surface inside the tube allows light to traverse straightaways, angles, and 90-degree turns through ceilings and walls with minimal loss. The light can be dimmed as it enters through the ceiling fixture and even directed to highlight a wall or table display.

The light may be softer or stronger depending on the day's conditions, but there are no shifting beams of light, and the level can be adjusted for comfort.

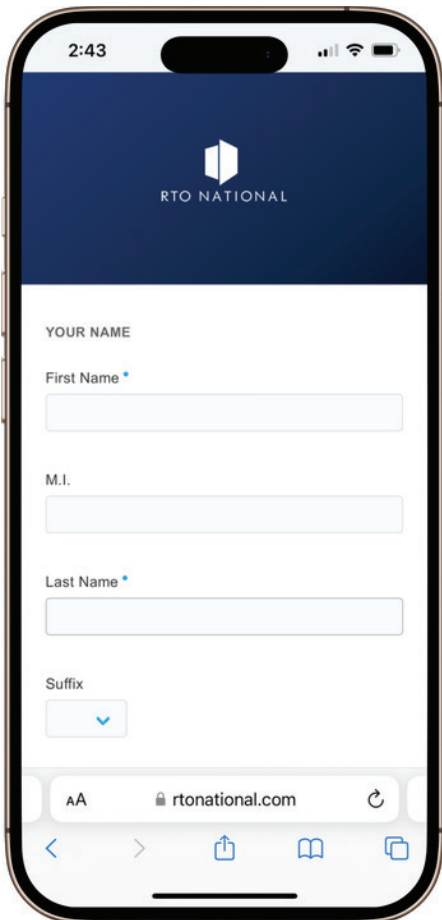
The daylighting system and the electrical lighting system can also be integrated so that the source of filtered daylight during daytime hours becomes the source of electric light once daylight fades.

A common concern with daylighting systems is leakage. These systems are designed to be leak-proof. Solatube tubular daylighting devices are engineered so that all openings into the building are protected, with glazing materials overlapping and encapsulating internal openings to ensure water cannot penetrate. Additionally, the system's flashings use a special sealant that maintains flexibility over time at all points of contact with the building envelope. As a result, future movement in the building roof or structure typically does not cause leaks.

Tom Larwa, Vice President of Customer Experience at Kingspan Light + Air North America, and Digert agree that these systems can have very long lifespans. "We've seen the Solatube in use for decades without any issue," Digert concluded. **PB**



Tubular daylighting selectively captures sunlight, stripping it of ultraviolet light and heat, and redistributes it. PHOTO COURTESY OF KINGSPAN LIGHT + AIR NORTH AMERICA



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