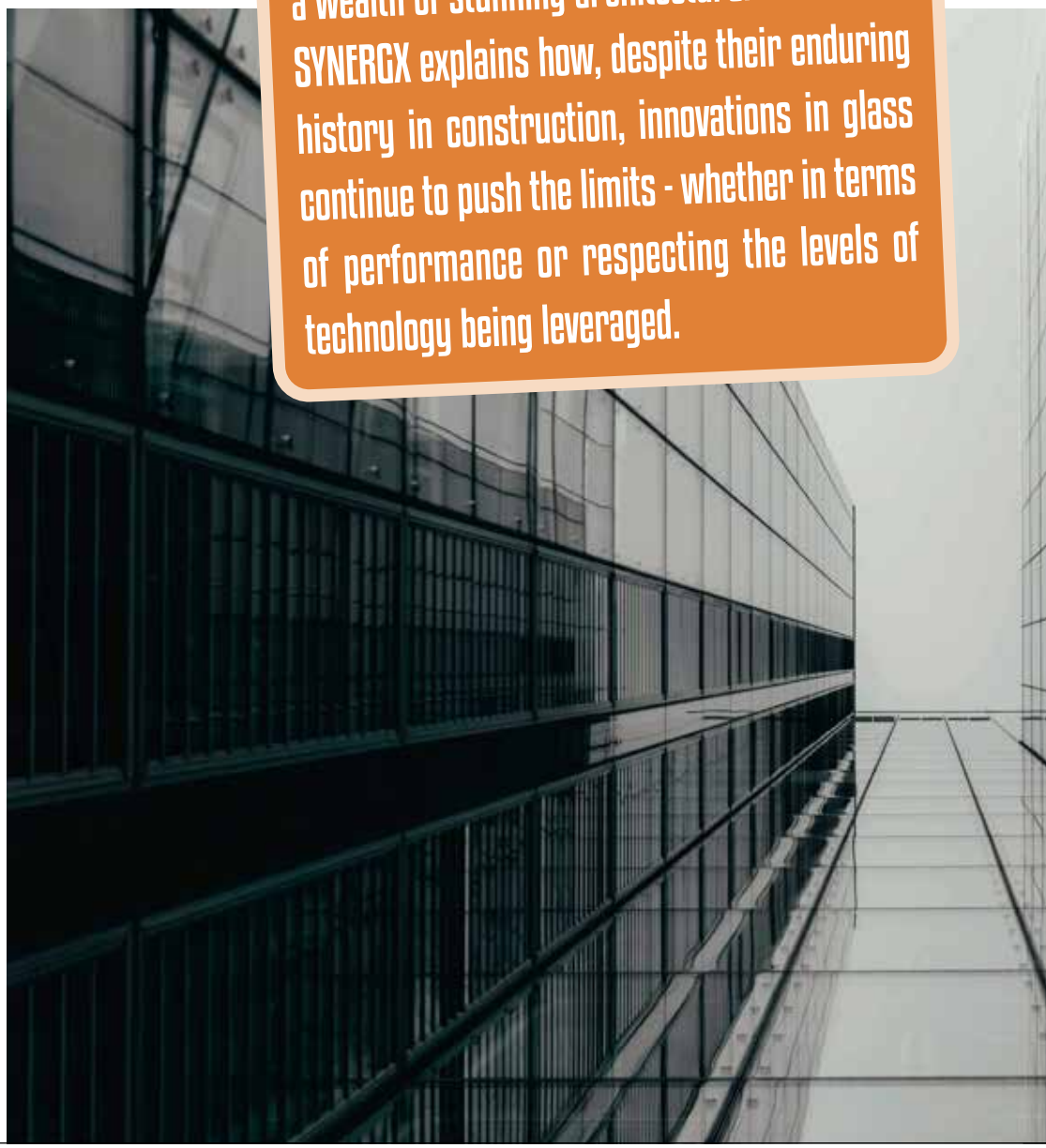
Architectural glass 101 - compliments of SYNERGX

For almost two millennia glass has pioneered a wealth of stunning architectural feats. Here SYNERGX explains how, despite their enduring history in construction, innovations in glass continue to push the limits - whether in terms of performance or respecting the levels of technology being leveraged.



Heat transfer prevention is just one of many new techniques employed in architectural glass manufacturing today. That's no small matter when one considers how cooling expenses will typically soar in summer. Put simply, glass is made by mixing very pure sand or quartz with soda ash, dolomite and limestone - then heating the mix at a very high temperature until it melts and turns into a liquid. During this heating process, the sand undergoes a complete chemical transformation to become the transparent amorphous solid material known as glass. Adding dyes to the basic mix allows producers to have coloured glass. Glass can be composed of other basic ingredients too. Borosilicate is more popular now and is already ubiquitous in both electronic displays and devices.

THE ADVANTAGES OF GLASS IN ARCHITECTURE

Glass is probably the best-known construction material that perfectly blends

aesthetics and function. Used extensively in both residential and commercial buildings, it offers a wide range of advantages for building designers. These follow here in more detail.

AESTHETICS

Glass' clean and sleek lines offer a contemporary and impressive aesthetic. Glass transmits, refracts and absorbs light which, in turn, elevates the beauty of a building's outdoor design as well as its indoor ambience. In addition, glass provides natural and relaxing lighting - all while making interiors look more spacious. It's also been well-documented as improving the mood of occupants of buildings as well as their productivity levels.

MAINTENANCE

Thanks to their smooth and glossy surface, most glass types can be very easily cleaned. Some are even self-cleaning (hydrophobic and hydrophilic), meaning that the surfaces keep themselves free of grime and dirt.

DURABILITY AND PERFORMANCE

As a dimensionally stable building material, glass is highly resistant to corrosion, extreme weather conditions, breaches and other sources of potential damage. The physical properties of glass make it very resistant to abrasion, high temperatures, rust and vermin. Glass is also a fantastic sound insulator. Furthermore, glass experiences no yellowing, weathering or clouding as it can transmit 80 percent or more daylight. As a material, glass maintains its structural integrity and appearance for a very long time. Finally, it's the only cladding material that allows energy to be harvested within a building - either as light or heat.

VERSATILITY

Glass can be cut and manufactured into almost any shape or form, enabling architects to create stunning glass buildings or interiors without compromising on design. It can be used for a myriad of applications - such as unique fenestration, facades, doors, partitions, storefronts, floors, roofs, elevators, balconies, ceilings, skylights, design elements and more.

SUSTAINABILITY

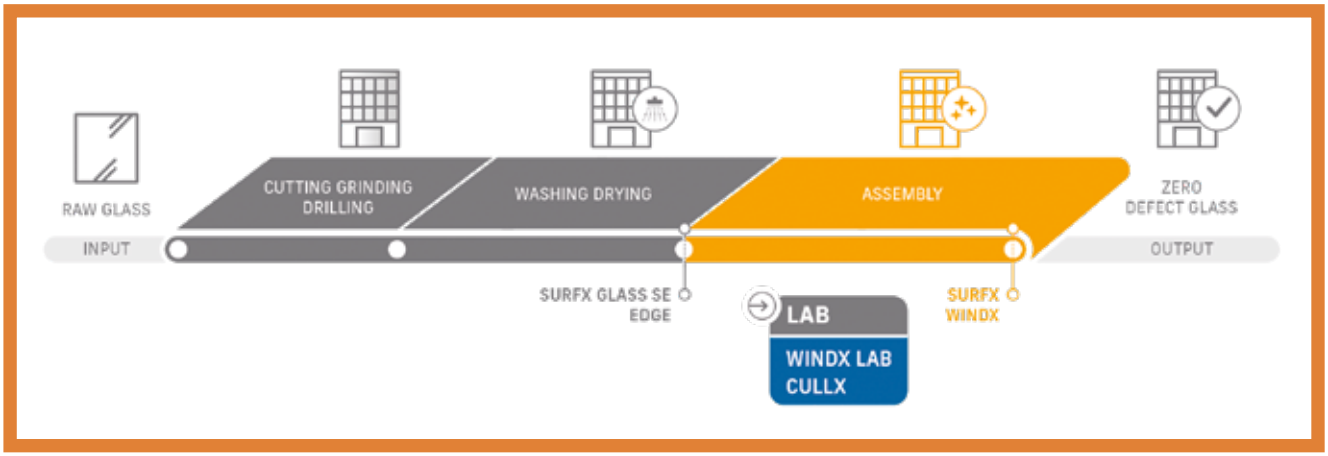
Glass is the only material that actually offers energy gains. It enables building designers to apply both active abnd passive daylighting techniques, helping to reduce artificial lighting requirements. Energy efficient glass, including low-emissivity glass (low-e) can contribute to lowering energy consumption and earning LEED points. Finally, glass is infinitely recyclable, which lowers greenhouse gas emissions and avoids the extraction of new raw materials.

COST

Architectural glass products can be very cost-effective cladding and design materials that can boost energy savings and lower utility bills. It's an excellent material for thermal insulation and waterproofing as well. Due to the sheer range of glass products on the market, as well as its many features and performance levels, architects commonly turn to it as the perfect building material to keep their budgets in check.

ARCHITECTURAL GLASS TYPES

The aesthetic and technical properties of archi-



tectural glass allow for an almost limitless array of applications for both indoor and outdoor applications. The most popular architectural glass products include the following:

BASIC PRODUCTS

The most common architectural glass products are categorised as clear, extra-clear and coloured. Clear glass is produced in a float line without additives in order to be completely transparent. However, iron contained in the raw materials causes a slightly green tint. Extra-clear glass, also known as low-iron glass, contains very little iron to eliminate the greenish tint found in clear glass. Coloured glass, as the name implies, is a type of glass that's coloured. This is made by adding mineral or purified metal salts to the raw materials. Coloured glass was popular from the 1950 to the 1980 because it allowed for a lowering of the solar heat gain. It lost the favour of architects when transparent coatings were developed.

SAFETY GLASS

This glass has additional features that render it harmless to people and the surrounding environment if it is struck, breaks or falls to the ground. Safety glass is renowned for its strength and even fire resistance. There are two types of safety glass, namely laminated glass and tempered glass. Laminated glass is manufactured by binding two or more panes of glass with a layer of plastic. If the laminated glass does break, the fragments will adhere to the middle layer rather than fall to the ground. Laminated glass is ideal for architectural products that require screening UV rays, soundproofing, and buildings subject to high risks, such as banks, museums, and storefronts - or subject to extreme weather conditions, like hurricanes and high winds. Tempered glass is a safety glass that's produced by using heat to strengthen the glass. If tempered glass breaks, it shatters into tiny round pieces rather than sharp shards. Tempered glass is typically used for interior applications: partitions, offices, conference rooms, decorative panels, doors and windows, etc.

COATED GLASS

Coated glass is a broad term for any architectural glass product that features a metallic coating or paint. It can be transparent, translucent or opaque. In Louis XIV's time, the mirror was the most coveted luxury item. That led to the creation of the Manufacture Royale des

ABOUT SYNERGX

Founded in 2004, SYNERGX Technologies is a high-tech company and a world leader in optics photonics applications dedicated to the manufacturing sector. The company is also a provider of non-contact inspection and metrology solutions that are designed to optimise glass manufacturing processes. As such it offers a complete and integrated platform for architectural glass inspections. Since 2008, SYNERGX has continued to expand its product line and customer base of OEM automotive glass manufacturers. In order to better serve its global customers, the company has set up permanent offices in China (2013), Europe (France 2019), Michigan (USA 2020) and South Korea (2021). It is now focused on greater growth through new market expansions and M&A opportunities. SYNERGX counts on its expert team to develop even more innovative solutions that can carry its customers into the future and beyond.

Glaces à Mirror in Saint-Gobain, north of Paris in 1665. Of course, the mirror is now a commodity product found in all homes, much like transparent metallic coatings that provide solar control and insulation. While used as early as in ancient Egypt and Mesopotamia to decorate glasses and vases, fritted glass has experienced a renaissance in modern architecture with the advent of ink jet printing. Frit is a ceramic paint similar to that used in pottery which can be laid out into patterns - like lines or dots, or full-colour pictures. Frit glass techniques are often used to control views of a highly transparent building, make a graphical statement or blur away glass joints. Painted and printed glass can feature imagery, patterns, texts or simply colours to create unique and spectacular environments. Paint and printed glass is even being used for outdoor building fenestration to save the estimated millions of birds killed on impact each year when flying into glass.

INSULATED GLASS

Typically offered in dual and triple glazing, the insulating glass unit features two or three lites of glass separated by dry air or an inert gas like argon. This gap prevents heat loss through doors and windows. Again, as the name suggests, dual-pane glass insulates twice as much as single-pane glass. Triple-pane glass offers even better energy efficiency. Architectural glass for commercial and residential buildings offers several advantages: beauty, design flexibility, safety, energy efficiency, durability, electric, sound and thermal insulation, ease of maintenance - the list goes on. There are very few other construction materials on the market that have as many compelling features and last for ages. Here one can be confident that with the latest technological advances in glass production, the popularity of architectural glass is here to stay.

SYNERGX

SYNERGX
Stephane Lemieux
2912, Joseph A. Bombardier
Laval, QC, H7P6E3
CANADA
Tel.: +1-450-978-1240
E-mail: info@synergx.com