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Virginia Glass Products Corporation

THERMAL TECHNOLOGY FOR TOMORROW'S CONSTRUCTION NEEDS



TPS Insulating Glass Spacer System





A Heritage Of Quality

Since 1913, successive generations of Virginia Mirror and Virginia Glass Products' founding family have supported our business with the classic principles of quality, craftsmanship, and service. This basic philosophy has proven to be the foundation of our stability. Whether manufacturing mirrors, custom tempered glass, insulating glass, spandrel, or all glass entrances, we recognize that all glass products are not created equal.

**Our customers have a choice from whom to buy.
We never lose sight of this.**



Projects Utilizing TPS

Insulating Glass Spacer System



■ **Nokia Office Building** Helsinki, Finland



■ **Public Library** Port Washington, NY

■ **Lucent** Nürnberg, Germany

■ **Burla Verlag** Offenburg, Germany



■ **315 W 33 Street** New York, N.Y.

■ **Nord-LB** Hannover, Germany

■ **Volkswagen** Wolfsburg, Germany

■ **Telia Office** Helsinki, Finland



■ **White Plains HS** White Plains, NY



■ **Bystronic Inc.** Hauppauge, NY





What is TPS Insulating Glass?



TPS stands for Thermo Plastic Spacer system. It also stands for the ultimate in “Warm Edge” insulating glass technology by replacing the highly conductive metal spacer with an elastomeric butyl-based thermoplastic spacer.

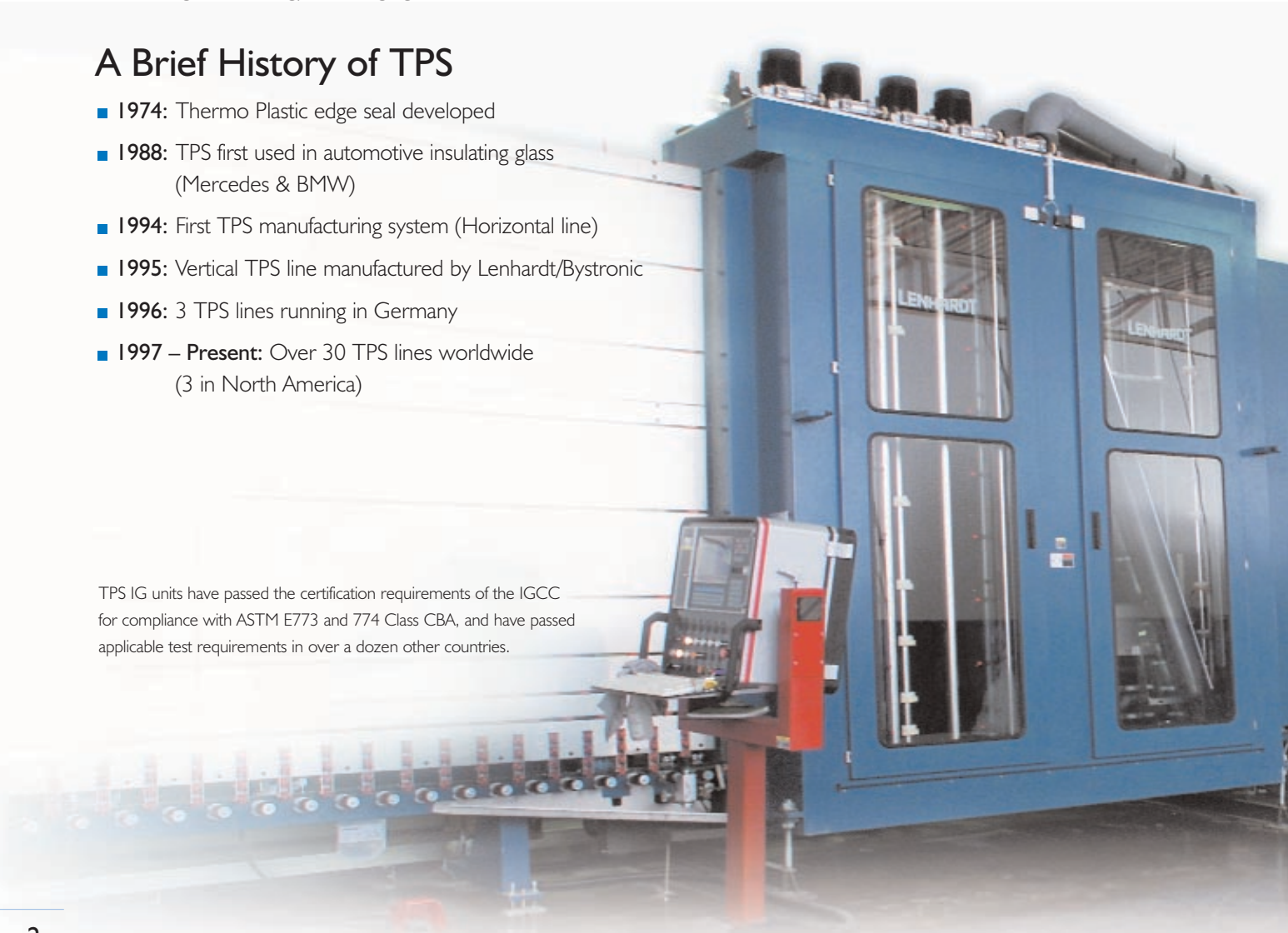
Advancing Commercial Construction

Until now, the aluminum box-spacer has been the traditional material used for the manufacture of insulating glass. Architects were given very few choices for Warm Edge insulating glass for commercial applications. SureSeal™, with TPS Warm Edge technology, is changing that.

A Brief History of TPS

- **1974:** Thermo Plastic edge seal developed
- **1988:** TPS first used in automotive insulating glass (Mercedes & BMW)
- **1994:** First TPS manufacturing system (Horizontal line)
- **1995:** Vertical TPS line manufactured by Lenhardt/Bystronic
- **1996:** 3 TPS lines running in Germany
- **1997 – Present:** Over 30 TPS lines worldwide (3 in North America)

TPS IG units have passed the certification requirements of the IGCC for compliance with ASTM E773 and 774 Class CBA, and have passed applicable test requirements in over a dozen other countries.



Exploring the Origin

Advancements In Glass

The glass industry's notable achievements in design and use of architectural glass, as well as glass technology and machinery have, for years, originated in Europe. TPS, the cornerstone of SureSeal™ Insulating Glass, has its roots in two separate segments of European glass expertise.

Technology The thermo plastic spacer was developed by a German chemical company in 1974.

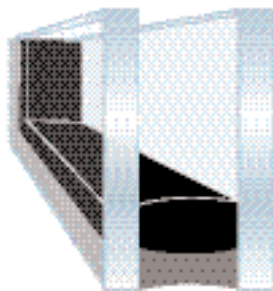
Manufacturing The current means for manufacturing SureSeal™ Insulating Glass with the TPS spacer system was developed and is manufactured by Lenhardt, a German company world renowned for its innovation in the field of insulating glass manufacturing equipment.



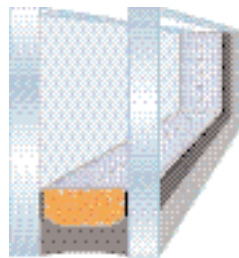
How SureSeal™ Will Work For You

Understanding SureSeal's™ "Warm Edge" Technology

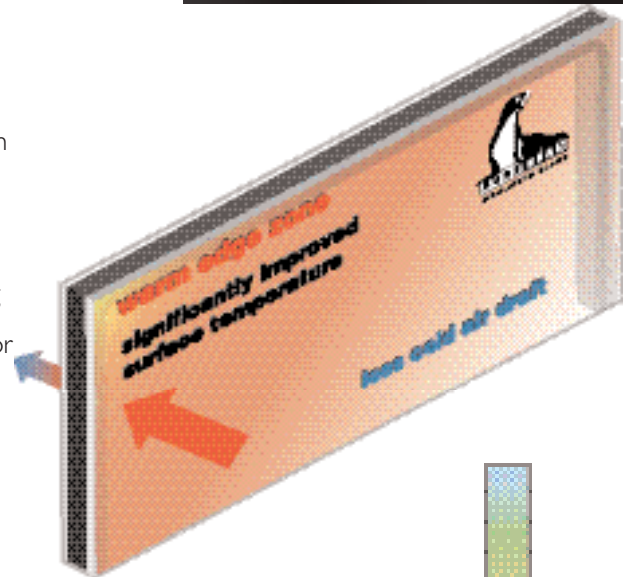
The term "Warm Edge" applies to insulating glass units having an edge seal with enhanced thermal insulating properties, thus reducing the conduction of heat and cold. SureSeal™ Insulating Glass offers the most advanced European Warm Edge insulating glass technology, providing energy savings, optimized comfort for building occupants, and reduced likelihood of condensation around the window edge. SureSeal™ offers extreme durability and unmatched life expectancy.



SureSeal™ Insulating Glass



Traditiona

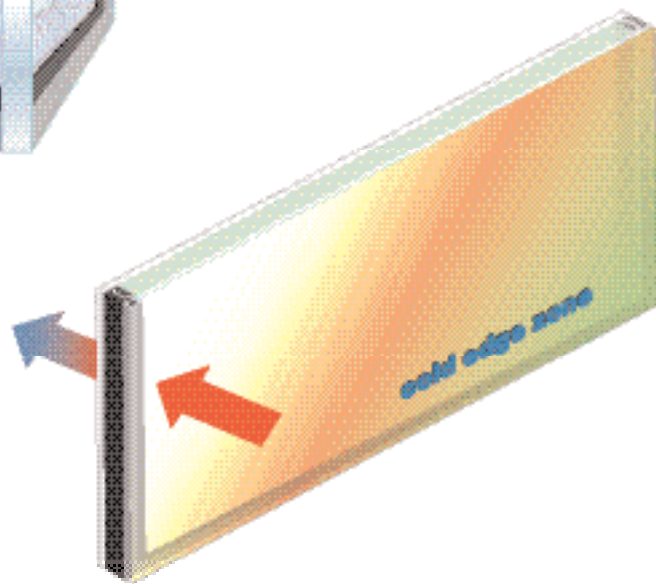


Insulating Glass

65° F
67° F
68° F
70° F
72° F

The Ultimate In "Warm Edge" Technolo

- SureSeal™ Insulating Glass units have up less thermal conductivity at the edge zo IG units made with conventional aluminum spacers.
- Total heat loss of units with the TPS spacer is reduced by up to 12%.
- SureSeal™ Insulating Glass units surpass the insulating values of units utilizing other types of "Warm Edge" spacers.



SureSeal™ The Optimal Heat Insulation

The Benefits Of Improved Heat Insulation Are Plentiful

- Reduced cold air drafts
- Energy cost savings (and lower environmental emissions)
- Improved building occupant comfort
- Significantly reduced chance of water condensation at the edges of the windows
- Even temperature distribution over the entire glass surface
- Reduced risk of mold formation at the window perimeter
- Keeps cold out in winter, conductive heat out in summer



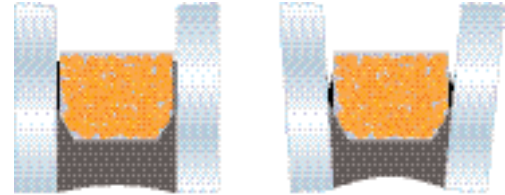
SureSeal™

Added Advantage



Flexibility Is Strength

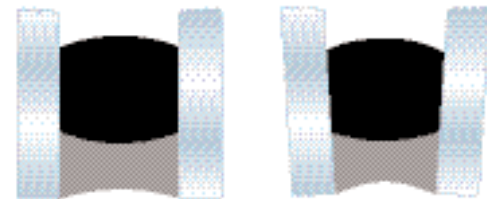
SureSeal's™ flexible spacer and seal combination tolerates thermal stresses and pumping wind loads better than rigid metal spacers. The entire spacer flexes with the bending action of the glass without the concentrated stresses on the thin primary seal found in IG units made with metal spacers.



the glass/spacer bond places the primary seal in jeopardy of failure.

Unmatched Life Expectancy

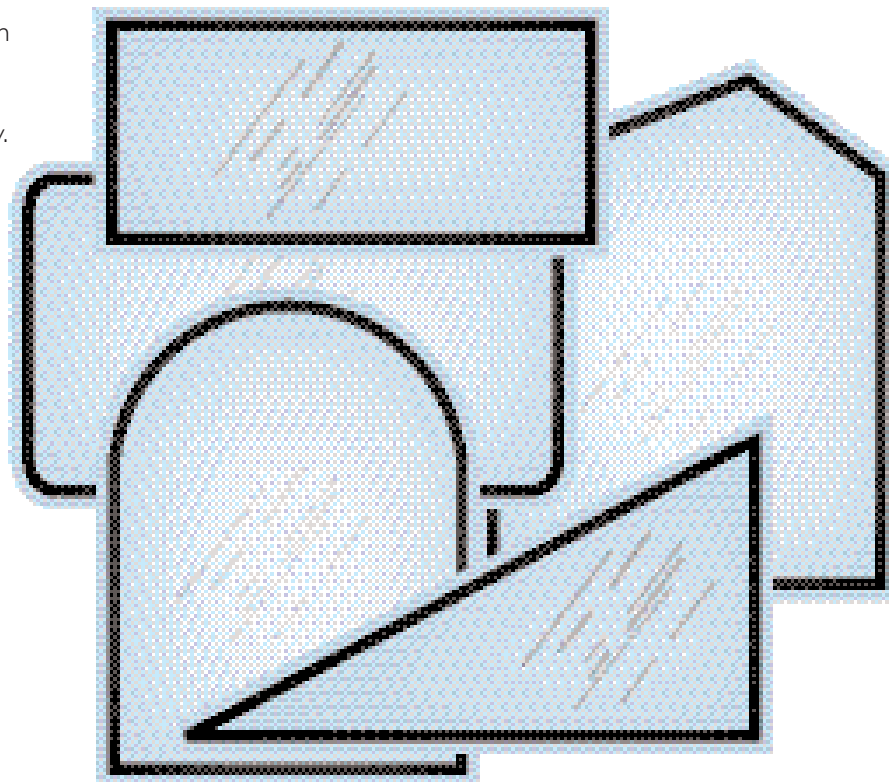
The durability of the flexible spacer, as well as the high concentration of the integrated desiccant, afford SureSeal™ Insulating Glass units a life expectancy unsurpassed by other spacer systems. Test results indicate 80% to 125% improvement.



The flexibility of the Thermo Plastic Spacer allows for expansion and contraction without concentrated stress on the primary seal. The entire TPS spacer/seal expands.

Versatility

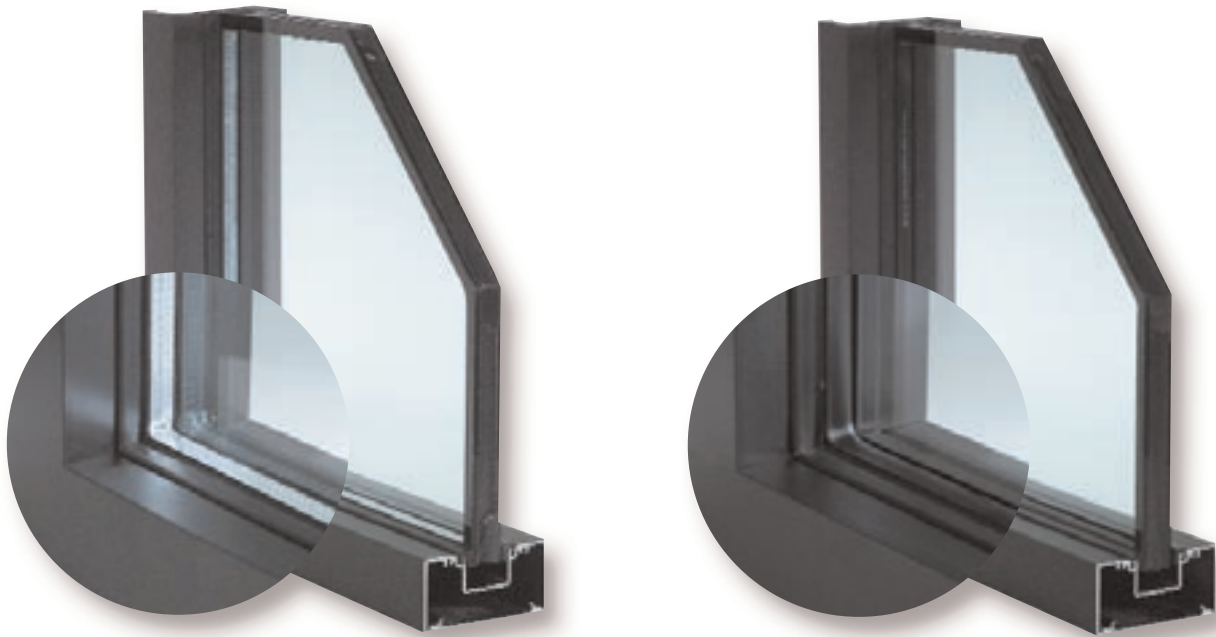
Countless shapes with the same consistent precision and integrity.



More than Meets the Eye

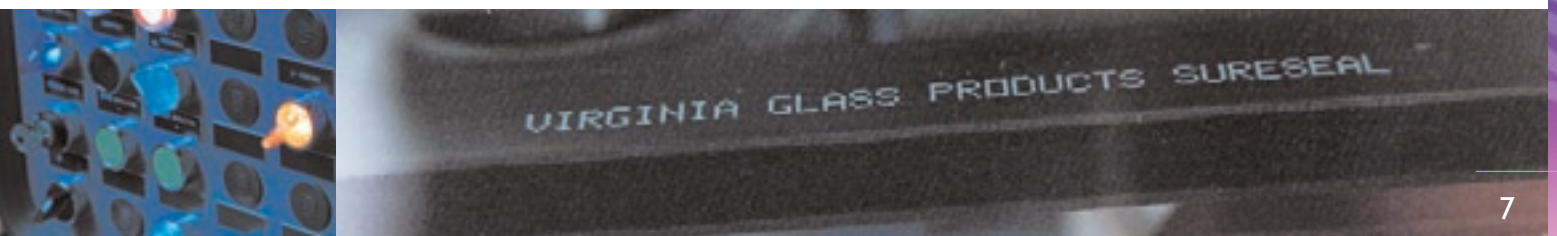
Appearance

The aesthetically pleasing, smooth, black satin spacer is an attractive and harmonious blend between glass and frame. No more stark contrast between bright metal spacers and the frame and gasket.

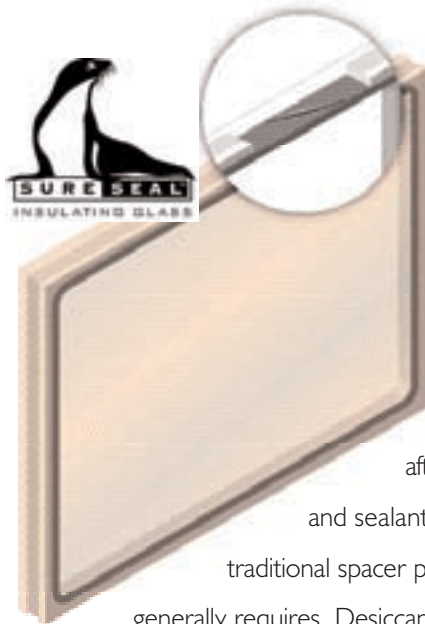


Gas Filling Integrity

SureSeal™ offers architects the ability to specify a gas-filled, structurally sealed silicone IG unit with the confidence that the TPS seal will maintain the integrity of the gas filling. SureSeal™ has significantly improved gas retention as compared with conventional silicone sealed units.



SureSeal™ How We Make It



Consistency

Fully automated, state-of-the-art CNC robot extrudes and applies the spacer with unwavering precision, time after time, unit

after unit. SureSeal™ spacer

and sealant are not “handled” as

traditional spacer production and assembly

generally requires. Desiccant and sealant are not exposed to factory environment prior to placement on glass surface. Spacer is seamlessly applied with only one self-sealing, air-tight, sloping joint.

Structural Integrity

SureSeal™ Insulating Glass utilizes a two-part, neutral cure, structural silicone for the secondary seal. Robotics insure the proper application for the ultimate in uncompromising strength.

Production Facilities

SureSeal™ is manufactured under strictly controlled environmental conditions in a room designed solely for the promotion of product cleanliness, consistency, and quality.

Technologically Advanced

With SureSeal™ Insulating Glass you will be exceeding your clients' expectations for high performing, thermally insulated window technology. Tomorrow's most advanced warm edge glass technology is available **NOW**.

