

Thermal Technology

Taming the Elements to Increase
Your Competitive Edge



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Today's architects, contractors and building owners help create buildings that offer occupants better performance, protection and possibility. They work to build their legacies by meeting evolving market demands, incorporating sustainable solutions and using durable products built to last. And they are more aware of stretching their dollars than ever before. In short, they demand performance that withstands climate extremes, while maintaining fiscal and environmental responsibility.

To meet the demands of decision-makers in both the new construction and remodel/restoration markets, manufacturers must improve quality, enhance durability, make design improvements and test thoroughly before, during and after manufacture.

Whether your building is new, retrofit or historically restored, you should consider the energy savings that result from the latest thermal technologies. They provide your building with a competitive edge – both now and for the future.

When designing systems and products, Kawneer considers the benefits of thermal barriers and how they relate to your needs and applications. Occupant comfort, energy savings, structural performance, sustainability and condensation resistance all remain top of mind.

Heat Transfer

To keep buildings running efficiently, commercial façade and fenestration products need to combat the transfer of heat from exterior and interior environments. There are three basic types of heat transfer: **conduction**, **convection** and **radiation**.

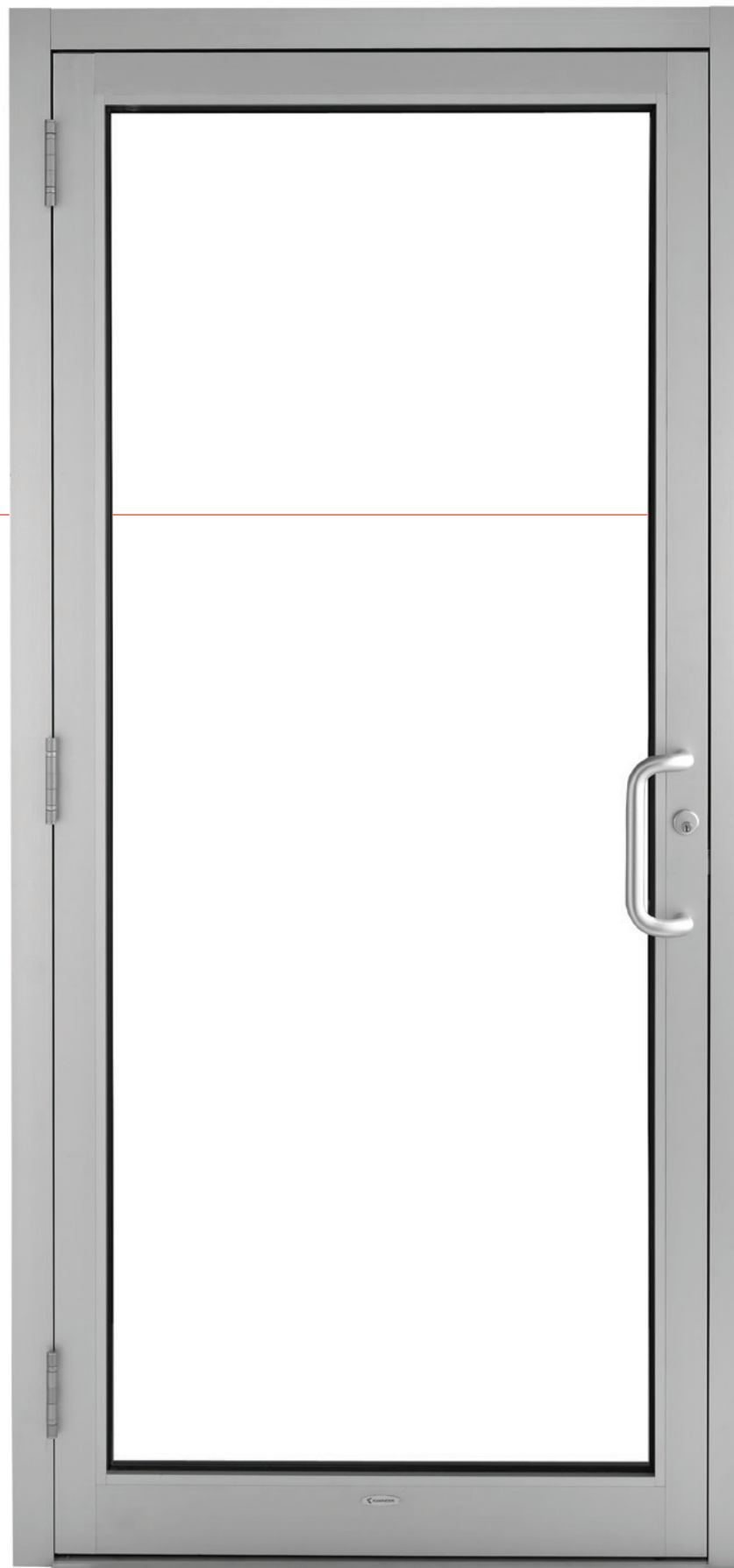
Since aluminum has a high level of heat transfer via conduction, a thermal barrier must be integrated into the system to minimize heat transfer.

Structural Performance

Structural loading is an important consideration when designing a thermally broken system. **Tension**, **torsion** and **shear forces** are all transferred through the thermal barrier, which must be able to handle these forces. Additionally, composite assemblies and non-composite assemblies react to and perform differently because of these structural performance factors.

Composite strength and thermal cyclic durability of Kawneer systems are calculated (or tested) per AAMA TIR-A8-2016 standards.

Thermal Barriers +
Energy Efficiency =
Increased Marketability



Many types of thermal barriers have been developed as a result of product research, market changes, consumer and owner demand. To assist your decision-making process, a description of the major types follows.

In general, there are two broad classifications of thermal barriers: thermally broken and thermally improved.

- A product is considered **thermally broken** if the separation between the interior and exterior metal is 0.21" (5.3 mm) or greater.
- **Thermally improved** systems are generally defined as having a separation between the interior and exterior metal of less than 0.21" (5.3 mm) but not less than 0.0625" (1.59 mm).

Official definitions can be referenced from industry standards ANSI/NFRC 100 (Thermally Broken Members) and AAMA 507 (Thermal Barrier Framing System). Examples of such systems include pour and debridged urethane systems, crimped in place polymer isolator systems and pressure-glazed systems with intermittent fasteners.

IsoPour™ Thermal Break Technology

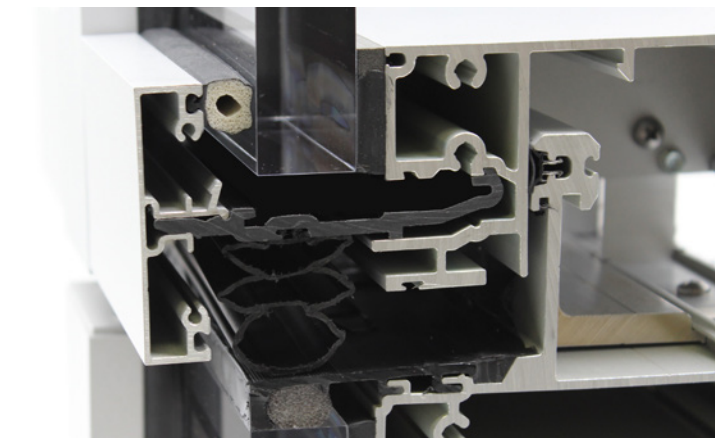


By merging industry-proven pour and debridge and polymer isolator technologies, the patented IsoPour™ Thermal Break technology creates thermally broken assemblies for enhanced building energy efficiencies with high structural performance.

IsoPour™ Thermal Break technology helps eliminate cold spots, reduce condensation and provides dual finish options for design flexibility. And, the unique thermal break allows for more complex aluminum extrusion shapes, so when used in thermally broken doors a wider choice of locking option hardware is available.

Example products: 250T/350T/500T Insulpour® Thermal Entrances

Continuous Polyamide Thermal Break



A continuous polyamide thermal break applied vertically and horizontally helps provide ultra-thermal performance levels. Extruded polymer inserts allow a great deal of flexibility – changing the depth of the infill from a double insulating glass unit (IGU) to a triple IGU is as easy as changing the depth of the thermal separator. Depending on the depth of the separator and IGU type, the performance can be thermal, high-thermal or ultra-thermal.

This technology offers design flexibility for different exterior and interior finishes. The ultra-thermal performance option allows architects and designers to take their vision to a new level, regardless of climate or location.

Example product: 2500 UT Unitwall® System

IsoLock® Pour and Debridge Thermal Break

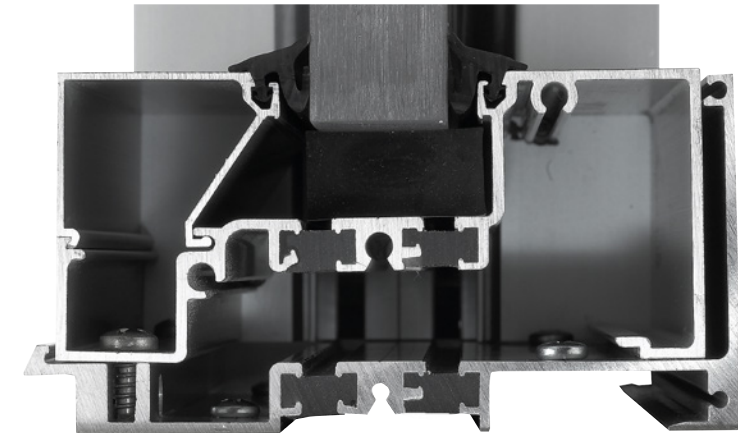
Pour and debridge (P&D) thermal breaks offer a cost-effective solution with superior thermal performance and a single-piece extrusion. Options are available in single and dual pocket designs.

Factory-supplied P&D products involve pouring liquid urethane into a cavity or thermal pocket, allowing it to harden and cutting away a small section of aluminum opposite the pour area to fully separate the exterior aluminum from the interior aluminum. This thermal barrier means there are fewer parts to cut and assemble. Therefore, less labor is needed and costs are reduced.

Kawneer's P&D thermal products utilize an IsoLock® process to eliminate expansion and contraction of urethane. The IsoLock® process can be achieved by one of two means. Prior to the pouring operation, the aluminum is either lanced into the cavity at increments of 1-1/2", or the interior of the thermal pocket is abraded. The lanced or abraded surface creates a mechanical lock in the urethane before it hardens, eliminating any potential for shrinkage. The mechanical locks, combined with the adhesive bond of the urethane to the aluminum, create a composite section used to meet design wind loads.

Example products: Trifab® 451T Framing System, Trifab® 601T Framing System, IR 501T Framing System, 8400TL Thermal Windows, MetroView® FG 501T Window Wall

Example products with dual IsoLock® lanced pour and debridge thermal breaks: Trifab® 451UT Framing System, Trifab® 601UT Framing System, IR 501UT Framing System



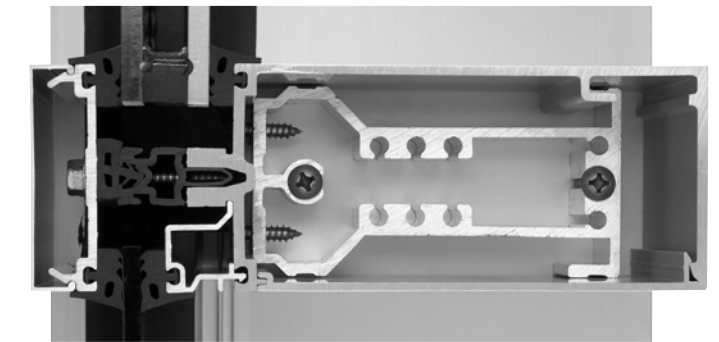
Thermal Separators

Thermal separators are typically made from engineered polymers or EPDM (ethylene propylene diene monomer) and used in curtain wall systems.

The low-conductance separator is positioned within the gutter of exterior-glazed curtain wall systems to simply and effectively separate the pressure plate and cover from the inside. This allows the interior mullion to carry the load for high structural performance and the exterior snap-on cover to have a different finish from the interior.

Systems with this thermal break method tout ease of assembly and can be leveraged for both double and triple pane insulating glass.

Example products: 1600 Wall System®1 Curtain Wall, 1600UT System™1 Curtain Wall

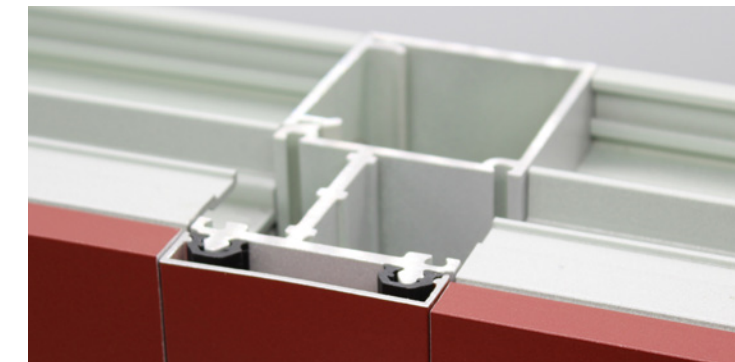


Thermal Isolator Clip

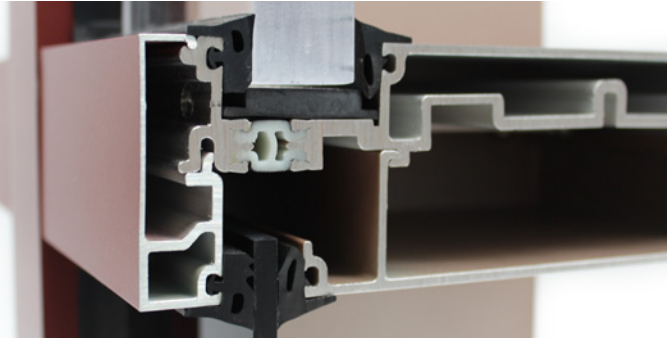
The thermal isolator clip method is used on curtain walls. Efficiently isolating the interior trim from the structural mullion, the clip improves the U-factor and CRF (condensation resistance factor) of these products.

This cost-effective thermal barrier is typically considered to be thermally improved and also provides the capability for different interior and exterior finishes.

Example product: 2250 IG (Inside Glazed) Curtain Wall System, 1600 Wall System®5 Curtain Wall



IsoStrut® Thermal Break

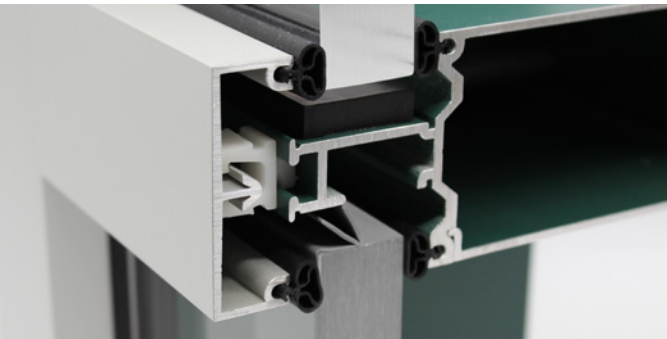


The patented IsoStrut® Thermal Break method achieves a high-strength bond between the aluminum and the thermal break material, which creates a composite assembly suitable for use in monumental curtain walls.

Since the assembly comprises two separate aluminum extrusions, different exterior and interior finishes are possible at very competitive prices.

Example products: 1600 Wall System®3 Curtain Wall, 1600 Wall System®4 Curtain Wall

Engineered Polymer Clip



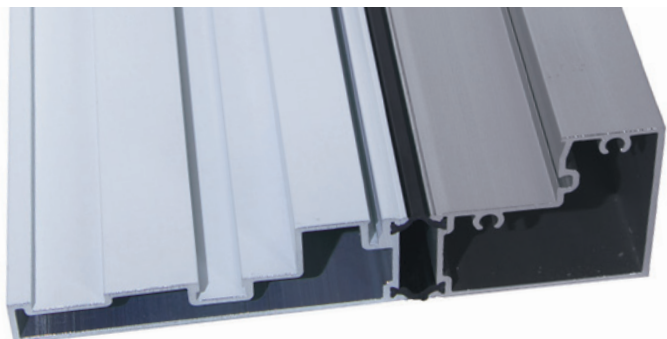
Engineered polymer clips are placed intermittently to separate the face and gutter of low-rise curtain walls and other framing systems. The clip eliminates contact between exterior and interior aluminum so that the transfer of heat is reduced from the inside to the outside or vice versa. The interior-exterior separation also helps prevent interior condensation.

The dual-purpose clip separates and connects the two extrusion halves, providing a variety of combinations that can be joined for economy and strength. The two-piece system also allows different finish combinations, providing for design and cost flexibility.

This thermal barrier is typically considered to be thermally improved.

Example products: 2250 L-R Wall System, EnCORE® Framing System

IsoWeb® Thermal Break



To improve the U-factor and CRF, the IsoWeb® thermal break system consists of two parallel glass-reinforced nylon strips installed continuously along the length of the extrusion. The depth of the thermal break can accommodate standard insulating infills of 1" thick or it can be increased to accept high-performance, triple-sealed insulating units.

Like the IsoStrut thermal break, two separate extrusions are used in the assembly, which allows different finishes on the interior and exterior. The mechanical lock at the nylon/aluminum interface provides for a stiff composite section, which is used in windows and framing systems.

Example products: 5500/5525 Thermal Windows, AA®6400/6500/6600 Thermal Windows, OptiQ®AA®4325 Series Windows, OptiQ®AA®5450 Series Windows, AA®250/425 Thermal Entrances, 2000T Terrace Doors, AA®3200 Thermal Sliding Doors, PG 123® Framing, 7500 Wall® Curtain Wall System

The Right Thermal Product for Your New Construction or Remodel Project

For decades, Kawneer has utilized its leading-edge knowledge of materials and manufacturing to design a series of products for increased energy conservation.

In fact, Kawneer was founded with an innovative product designed for durability and thermal efficiencies. Company founder and architect Francis Plym invented the first system to utilize metal to replace wood as a holder of heavy plate glass. His design also included ventilation openings to equalize the temperature on both sides of the glass. The patent was granted on May 15, 1906.

Kawneer incorporates these invaluable decades of experience with its philosophy of providing only the highest-quality products for the manufacture of thermal products. Each building situation is different, especially today. And different situations demand a range of precisely engineered products.

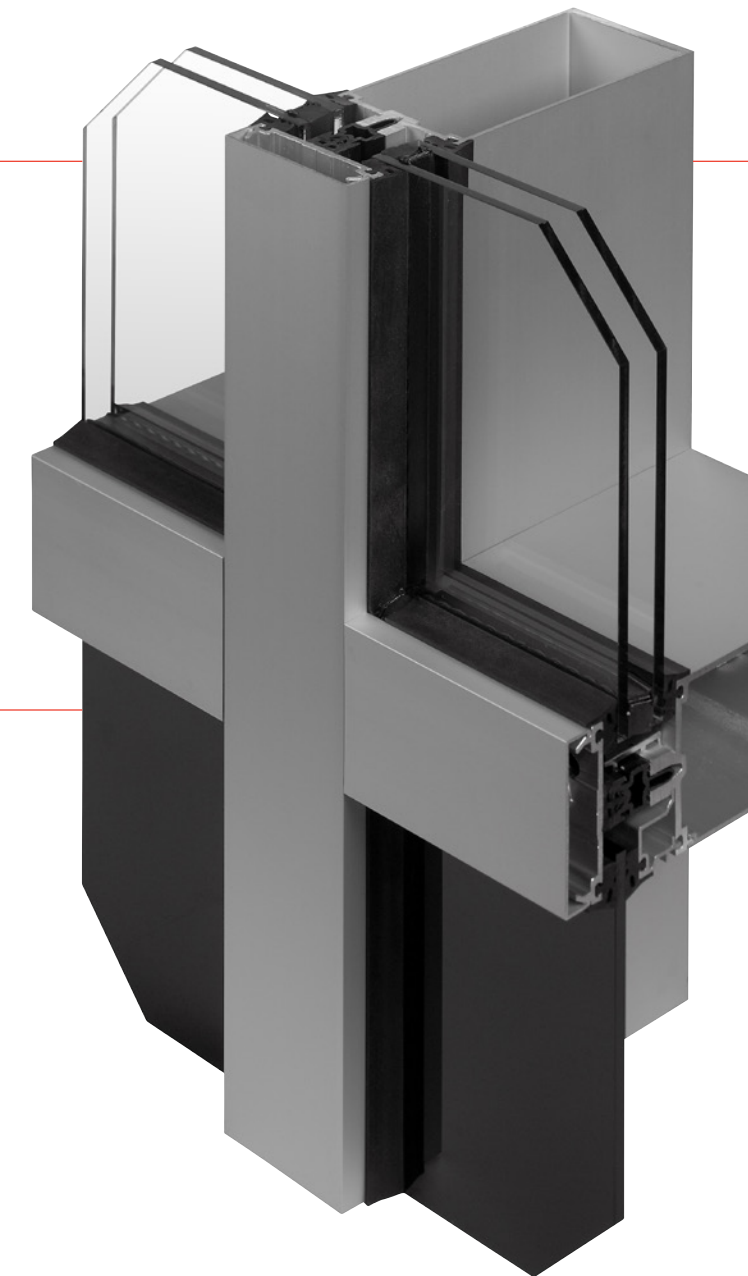
Kawneer's solutions draw on a long history of innovation to create next-generation technologies that inspire architects, contractors and glaziers to build better buildings. We advance our solutions to help build legacies. Kawneer's complete line of thermal framing, curtain walls and windows was designed with two principles in mind:

- To provide the highest-quality thermal products and thermal performance in the industry.
- To provide thermal products that respond to today's specific needs for framing, storefronts, curtain walls or windows — whether new, remodel, retrofit or historic renovation.

That's why Kawneer offers a wide range of thermal systems and solutions.

In today's highly competitive new construction and retrofit markets, Kawneer recognizes that quality assurance is vital. And a large part of that assurance comes from delivering the right product for your specific project.

Kawneer's thermal products offer a legacy of quality and a product line precisely engineered to solve most thermal challenges, supported by strict quality control during the manufacturing process. All products are manufactured and tested according to applicable NFRC, AAMA and ASTM procedures.



Building Legacies

Thermal performance will continue to be a trend for years to come. As market requirements shift, the need for thermal performance remains a constant. Kawneer is always pushing the envelope when it comes to delivering innovative, high-performing thermal solutions. Our standards of success are high to ensure we meet your needs. We build on the past to advance the future to help build your legacy.



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