Intelligent technology for fenestration systems that require superior thermal and structural performance.

The dual cavity pour and debridge thermal barrier concept is intended to impact the energy savings and increase the condensation resistance of aluminum fenestration products used in the building envelope. Ultimately, reducing energy consumption in buildings necessitates focusing first on improving performance of the exterior walls—or shell—of a structure, commonly comprised of storefront or curtain wall with large glazing apertures and panel infills.

Other benefits include,wider span opening sizes for increased natural daylighting to reduce the amount of electricity required for artificial lighting, along with decreased demand for fossil fuels necessary to run the core mechanical HVAC systems. Improving the exterior wall performance might also include interior and exterior sun shading systems and other passive strategies

Design guidelines

A dual cavity thermal barrier design is used in place of a single cavity thermal barrier in commercial aluminum storefront, curtain wall systems and windows.

When determining the cavity size, use the same dimension for both locations to make it easier to fill and debridge. As a general rule, both cavities can be filled and debridged at the same time. By maintaining the same spacing between cavities, the tooling and setup will be kept to a minimum and production output will not be compromised. A dual cavity thermal barrier should take no longer to produce than a single cavity aluminum extrusion design.

A dual cavity design can be applied to operable or fixed sash profiles if the overall width is large enough to accommodate two cavities and still provide room for assembly screws, corner keys and hardware.

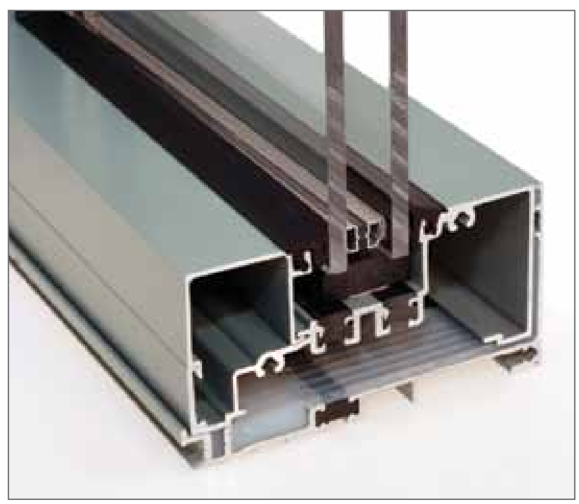
The dual cavity with MLP™ (mechanical lock profile), prepares the extruded aluminum member by incorporating a lancing lug within both thermal barrier cavities to provide excellent adhesion and to resist fracturing.

Contact the **AZO/Tec**® technical department for technical details, drawings and specifications **azotec@azonusa.com**.

Figure 1. Azon dual cavity

A dual cavity with MLP™ (mechanical lock profile) is debridged to eliminate the metal-to-metal contact resulting in a structural composite of aluminum and polymer to create the strongest thermal barrier for aluminum extrusions.

Figure 2. Performance components



When the dual cavity is combined with interrelated glazing elements such as high performance low E coatings, argon gas and a warm-edge spacer, a significant improvement in the overall U-factor will be achieved in the fenestration assembly.

©Azon 2014 TECHTB007 rev2

Producing a dual cavity

The production of dual cavity profiles in a single pass is achieved through simple modifications to traditional processing methods. Contact Azon to quickly assess design criteria or any machinery requirements.

When locating the cavities, care should be taken to allow for the use of a mechanical lock system. For a single pass mechanical lock, a Lancer™ is required. When selecting what cavity design to use—either the standard cavity or MLP™ design—the American Architectural Manufacturers Association (AAMA) TIR A8-08 guidelines must be followed.

Standards and guidance

The AAMA TIR A8-08 document S*tructural Performance of Composite Thermal Barrier Framing Systems* establishes a model standard for quality control procedures for thermal barrier systems with guidelines for cavity design, thermal barrier material selection, testing, manufacturing, fabrication, installation and environmental performance.

Thermal performance

By adding a second cavity, overall U-factor can improve by as much as 20%, depending on cavity size, cavity location and fenestration type. Interior frame temperatures and higher condensation resistance factor (CRF) are two other performance ratings that will improve with a dual cavity thermal barrier system.

Table 1. Performance* improvement comparison

Single cavity	Azon Dual Cavity
CRF up to 63	CRF up to 68
U-factor .36 to .44	U-factor .29 to .36

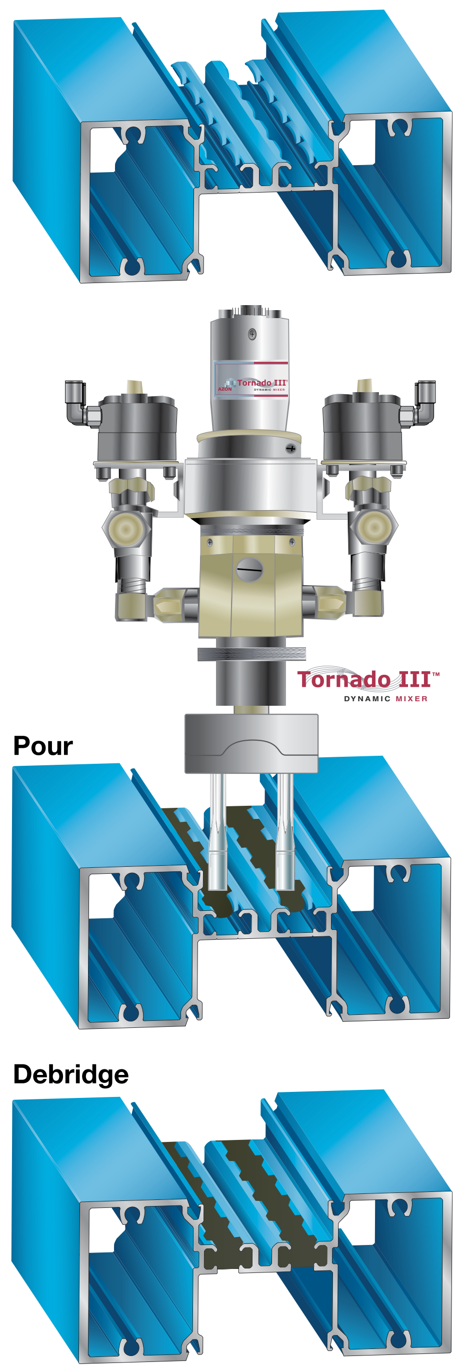
CRF (condensation resistance factor) is a numerical index generally in the range of 30 – 80 for conventionally glazed fenestration products based on the procedures outlined in *AAMA 1503-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.*

U-factor (U-value): The lower the U-factor, the more energy-efficient the fenestration assembly.

*Performance characteristics of a typical dual glazed storefront.

Figure 3. Dual cavity pour and debridge

Lancer™ method mechanical lock



Azon
643 W. Crosstown Parkway
Kalamazoo, MI 49008-1910
USA
Tel: (269) 385 5942
Fax: (269) 373 9295

Azon UK Ltd.
Unit J, St. David's Industrial Estate
Pengam, Blackwood
NP12 3SW
UK
Tel: + 44 (0) 1443 878010

Azon Korea Inc.
E1-Space
60-1 Samsung-Dong
Gangnam-Gu, Seoul 135-870
Korea
Tel: + 82 (0) 2 544 5906
Fax: + 82 (0) 2 544 5908

Azon Polyurethane (Shanghai) Co., Ltd.
Room 2804-2807, 28th Floor
Hua Yuan World Square
1958 North Zhongshan Road
Shanghai 200063
PR China
Tel: + 86 (0) 21 6212 2213
Fax: + 86 (0) 21 6211 0004

©Azon 2014 TECHTB007 rev2