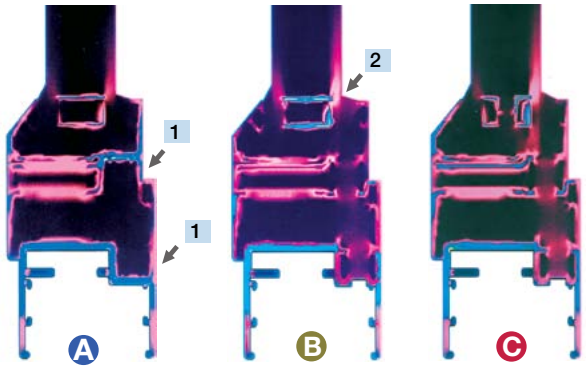
Thermal Barrier Performance Data

Technical bulletin TB008

Optimizing performance in commercial fenestration

Figure 1. Thermodynamic imaging with glazing



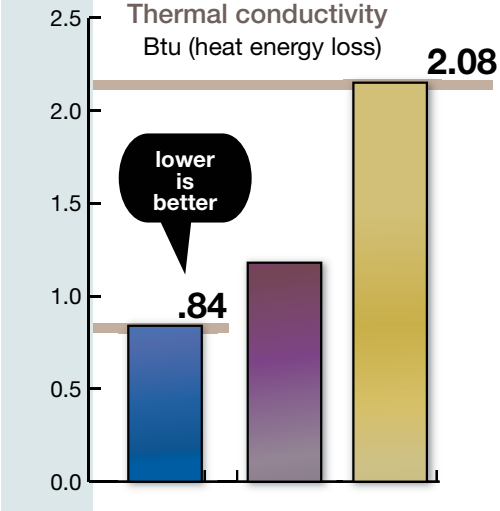
A Insulating glass unit with low-E, aluminum spacer and aluminum frame
The heat flow is through the frame as shown in blue at mid-point **1**

B The same low-E unit with an aluminum spacer and thermal barrier frame
The heat flow is now through the spacer as depicted by the blue through the spacer **2**

C Total performance package:
A low-E unit with warm-edge spacer and a thermal barrier frame
There is no direct heat-flow path

based on temperature outside: -17.8°C (0°F), ambient temperature inside: 21.1°C (70°F)

Figure 2. Thermal performance comparison



Material	Conductivity
Polyurethane*	0.84
Vinyl (plastic)	1.18
Polyamide (FG**)	2.08

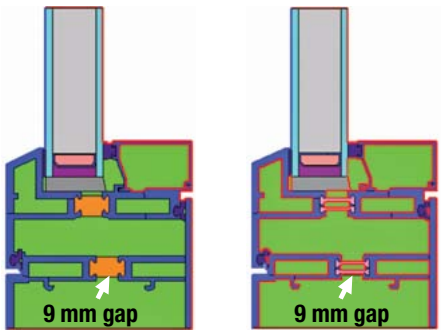
*polyurethane pour and debridge
**polyamide 6.6 with 25% glass fiber

Thermal conductivity of materials is measured in Btu-in/(hr-ft²-°F). The lower the thermal conductivity, the better the insulator.

NFRC 101: Procedure for Determining Thermophysical Properties of Materials For Use in NFRC*-Approved Software Programs
*National Fenestration Rating Council

Figure 3. Thermal barrier gap comparison

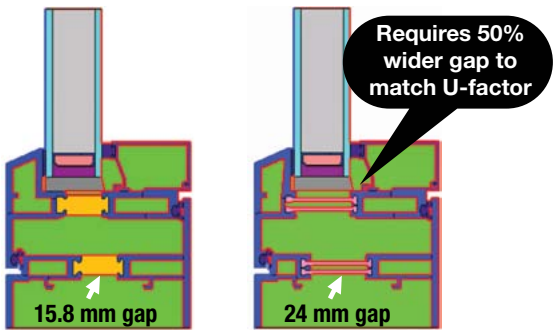
Similar thermal gap:



Polyurethane U-factor=0.43

Polyamide U-factor=0.44

Same U-factor, dissimilar gap:



Polyurethane U-factor=0.39

Polyamide U-factor=0.39

Based on lower thermal conductivity as shown in Figure 2, polyurethane outperforms polyamide in cavity gap comparisons.

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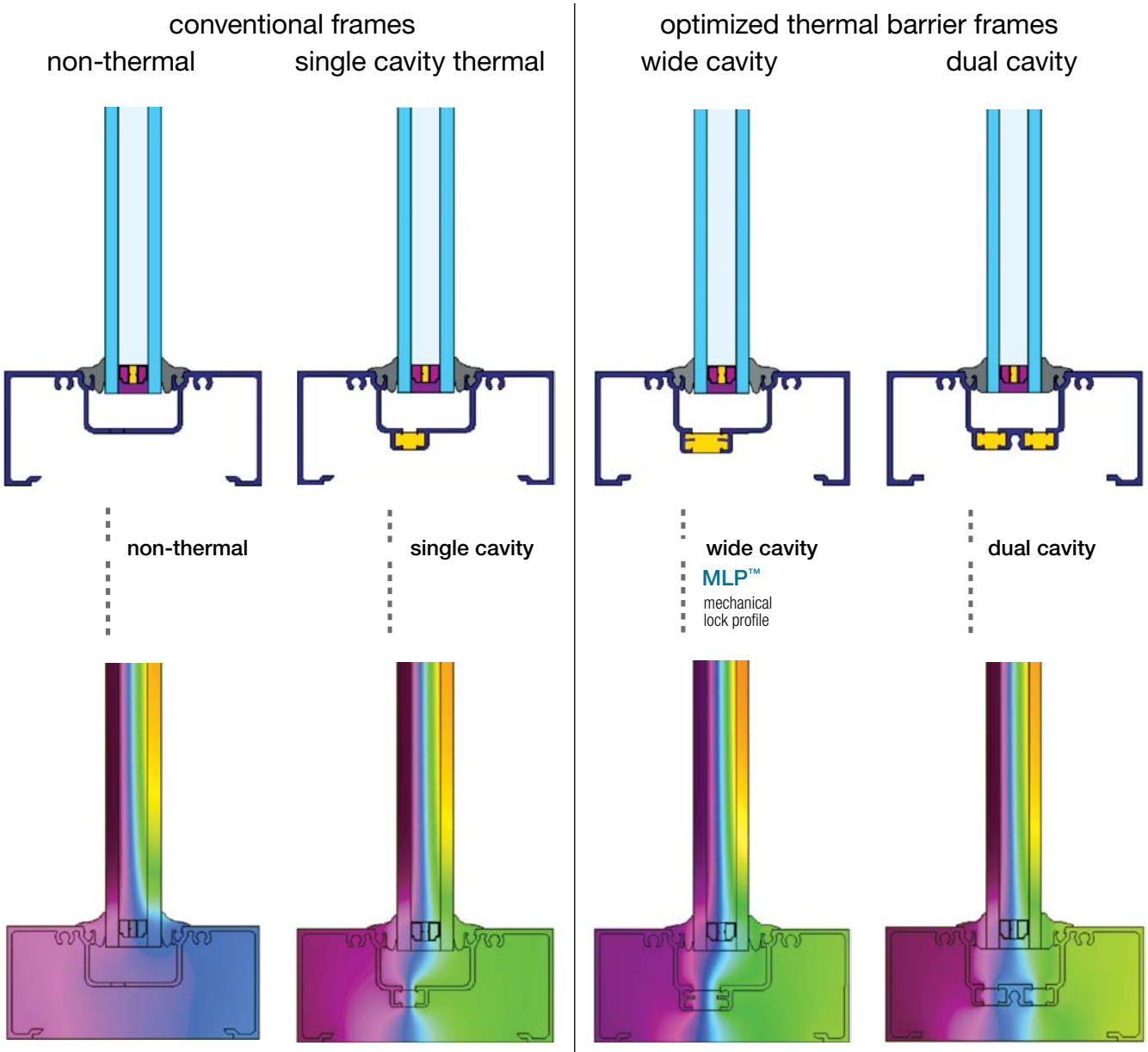
Figure 4. frame variations for aluminium architectural fenestration products



Aluminum frame types with insulating glass.
All insulating glass units made with: 1/4 in Solarban® 60, 1/2 in warm-edge spacer, Argon gas fill, 1/4 in clear

**Solarban® 60 Low-e solar control glass by PPG*

For more information about dual cavity thermal barriers, please refer to ***Technical bulletin Guide to dual cavity design (TB007)***

All calculations and thermal graphics were created with Therm and Window. Therm and Window are trade names of Lawrence Berkeley National Laboratory. SOLARBAN® 60 Solar Control Low-E Glass is a registered trade name of PPG Architectural Glass

Based on 0°F outside and 70°F inside air temperature Btu-in/(hr-ft²-°F) the lower the thermal conductivity, the better the insulator

The MLP™ (mechanical lock profile) by Azon, is a structural cavity design that allows for increased thermal barrier cavity size for improving the energy efficiency of aluminum fenestration products.

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

Azon, 643 W. Crosstown Parkway, Kalamazoo, MI 49008-1910
Tel: 269 385 5942 • Fax: 269 373 9295 • www.azonintl.com