# Producing a Structural Thermal Barrier

**Technical bulletin TB009**

## Guidelines for achieving the proper thermal barrier cavity

Properly fitted cavity design, size and location will provide correct structural support in the aluminum composite and increase thermal energy efficiency. Cavity design is just one factor that can improve the overall thermal performance and condensation resistance of the fenestration assembly. Design configuration—operating windows versus fixed glazing, single or dual cavity— along with high performance glass, gas filling and warm-edge spacers are variables that impact performance.

**Points to consider include:**

What is the end use of the profile?

What is the nominal wall thickness of the profile?

What is the overall size of the profile?

What are the structural requirements of the window, door, curtain wall or skylight assembly?

The American Architectural Manufacturers Association's publication AAMA TIR-A8-08 *Structural Performance of Composite Thermal Barrier Framing Systems*, provides the designer with guidelines for the selection of cavity size and design.

By taking precautions and implementing AAMA guidelines and common engineering practices, the thermal barrier cavity will successfully isolate the exterior of the aluminum from the interior. Azon has developed an additional set of recommendations for cavity size selection for some of the more common cavity sizes. Table 1 is based on wall thickness and Table 2 is based on the overall width of the extrusion. In addition, the AAMA TIR-A8-08 contains an expanded cavity chart that includes additional cavity sizes for consideration. To achieve optimal thermal and structural results, the designer should evaluate the proper cavity size and location using the AAMA cavity standards and guidelines.

**Mechanical lock**: Azon recommends the application of mechanical surface conditioning to mechanically lock the polyurethane polymer within the cavity prior to the pour and debridge process to insure proper adhesion to difficult finishes, while securing the structural soundness of the fenestration product.

Upon completion of the pour and debridge process, the resulting aluminum thermal barrier composite will decrease thermal conductivity, reduce the formation of moisture and frost on the interior profile, while saving energy-loss from cooling loads in hot climates and conditions.

Figure 1. Proper thermal barrier extrusion cavity location

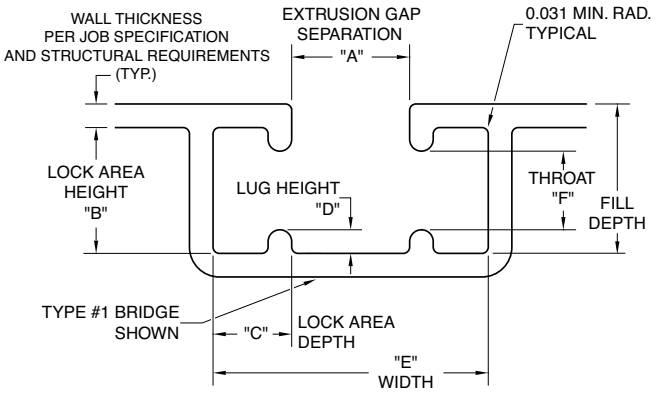


Table 1: Wall thickness, cavity size *guidelines

| WALL THICKNESS RANGE | | CAVITY SIZE |
|---|---|---|
| INCH | MM | |
| .050 - .070 | 1.2 - 1.8 | AA |
| .070 - .100 | 1.8 - 2.7 | BB |
| .100 - .250 | 2.7 - 6.4 | CC |
| .250 & UP | 6.4 & UP | DD |

* based on aluminum profile wall thickness

Table 2: Overall width, cavity size *guidelines

| PROFILE WIDTH RANGE | | CAVITY SIZE |
|---|---|---|
| INCH | MM | |
| UP TO 2.750 | UP TO 70 | AA |
| 2.750 - 3.500 | 70 - 89 | BB |
| 3.500 - 4.250 | 89 -108 | CC |
| 4.250 & UP | 108 & UP | DD |

* based on aluminum profile overall width

NOTE: Refer to AAMA TIR-A8-04, Page 8, Figure 9, for complete recommended cavity data.

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



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