

## Azo-Cast™ 217-25 MFC

### Structural Thermal Barrier Polymer

#### Product description

Azo-Cast™ 217-25 MFC is a proven, two-part, solid polyurethane system specifically formulated to provide the structural strength and insulating properties required in the manufacture of thermal barrier aluminium extrusions.

Azo-Cast 217-25 MFC may be characterised as having exceptional moisture resistance during processing and does not require preheating of the extrusion. Even though Azo-Cast 217-25 MFC is a high strength polymer, it should only be used after painting and anodizing the extrusion.

**Table 1: Physical properties of uncured materials**

	Azo-Cast™ A-Iso	Azo-Cast™ 217-25 MFC B-Resin	Measurement
Color	dark brown	dark blue	
Specific gravity		1.07 ± 0.01	
Density	1.23 ± 0.01 (10.28)	1.07 ± 0.01 (9.01)	g/cm <sup>3</sup> (lb/gal)
Viscosity at 25°C (77°F)	250 ± 50	650 ± 100	centipoise
Mix ratio	77 ± 2	100	by volume
Mix ratio	89 ± 2	100	by weight

**Table 2: Processing conditions of cured materials**

	Value	Measurement
Hand gel time (100 gram sample)*	30 ± 5	seconds
Machine gel time (100 gram sample)*	25 ± 2	seconds
Minimum debridging time**	6	minutes
Recommended pour temperature of chemicals and metal	25 ± 5 77 ± 10	degrees Celsius degrees Fahrenheit

All mixing and tests were conducted at 25°C (77°F) unless otherwise noted.

\*Gel time may alter slightly with variation in ambient and chemical temperatures.

\*\*Minimum debridging time will vary depending on the shape and size of the extrusion and cavity and on the curing conditions. Measurements should be taken to ensure that the hardness has reached Shore D 65 before debridging. Refer to Table 3 for optimal hardness value.





**Table 3: Performance characteristics of cured material (two hours at 70°C [158°F])**

	SI	IP	Test method
Tensile strength	39.99 N/mm <sup>2</sup>	5,800 ± 1,000 psi	ASTM D638
Elongation at break	>25%	>25%	ASTM D638
Modulus of elasticity	1,655 N/mm <sup>2</sup>	240,000 psi	ASTM D638
Notched izod impact	80.8 J/m	1.5 lb/in minimum	ASTM D256
Thermal conductivity K-factor	0.17 W/m-K	1.19 Btu-in/(hr-°F-ft <sup>2</sup> )	ASTM C518
Heat distortion temperature at 0.46 MPa (66 psi)	>65°C minimum	>149°F minimum	ASTM D648
Coefficient of linear thermal expansion	1.68 x 10 <sup>-4</sup> cm/cm°C	9.34 x 10 <sup>-5</sup> in/in°F	ASTM D696
Mixture density	1.14 ± 0.01 g/cm <sup>3</sup>	71.17 lbs/ft <sup>3</sup>	ASTM D1622
<b>Value</b>			
Hardness	77 ± 2	Shore D	ASTM D2240

Note: The test data herein stated are typical values, which may be used as a guideline in evaluating this material for its intended use. However, because of the variations in testing methods and curing conditions, it is not intended that this information be used as specification criteria. We recommend that polymer properties be tested on a regular basis to ensure that both chemicals and machinery are meeting the requirements of the thermal barrier system.

### Adhesion and dry shrinkage

AZON Azo-Cast 217-25 MFC polyurethane is a high strength structural polymer with thermal transmission properties of 0.17 W/m-K (1.19 Btu-in/[hr-°F-ft<sup>2</sup>]). Care must be taken to ensure that the pour and debridge cavity has a proper finish for the application of the thermal barrier. Dirt, grease, incomplete paint pretreatment, excessive paint overspray, poor rinsing and other factors can adversely affect adhesion and should be controlled during the processing and handling of the unfilled extrusions. Thus, prior to the selection of the thermal barrier material, please take into careful consideration the finish on the aluminum substrate. AZON recommends AAMA thermal cycle testing be performed on the combination of thermal barrier and finish to ensure that adhesion will be maintained.

The adhesive properties of thermal barrier chemicals remain primarily a function of the surface to which they are applied. To ensure a secure bond, AZON highly recommends the use of a mechanical lock.

### General

AZON Azo-Cast 217-25 MFC polyurethane fabricates well. It will accept most commonly used manufacturing techniques, however, drilling and milling are recommended over punching. Notching into the center of a poured cavity should be avoided, if possible, to lessen the danger of establishing leak paths in the design. Special caution should be observed in fabricating and handling in temperatures below 13°C (55°F), as the impact resistance may be reduced.

AZON Azo-Cast 217-25 MFC is formulated for rapid curing. It has excellent heat distortion temperatures. The filled and debridged extrusions should be handled with care after initial fabrication since the polyurethane may not reach the ultimate properties for seven days when stored at ambient temperatures 25°C (77°F).



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## Structural Thermal Barrier Polymer

## Product Data Sheet



### Processing

Care must be taken to avoid debridging the extrusions before the durometer hardness reaches Shore D 65. Failure to do so may cause excessive distortion and/or a safety problem since the partially debridged sample may be compressed by the drive wheels of the debridge saw and create a kickback condition.

As with all thermal barrier polymers, the reactivity and curing of AZON Azo-Cast 217-25 MFC can vary slightly with the temperature of the chemicals and the aluminium. It is recommended that the chemicals and extrusions be maintained at 25±5°C (77±10°F) for proper curing. Metal temperature should be maintained at a minimum of 18.3°C (65°F) for proper curing of the polymer.

Processing above or below recommended temperatures may result in processing, fabrication and distortion concerns for the manufacturer.

AZON Azo-Cast 217-25 MFC is not to be used for any other applications unless it is approved by written consent from AZON.

### Storage and handling

AZON thermal barrier components are very stable materials when properly handled. To avoid problems, it is important to understand that these materials are sensitive to moisture. Containers of the components must be stored in a dry area where the temperature range does not fall below 10°C (50°F) and does not exceed 37°C (100°F) for prolonged periods.

The expected shelf life of AZON chemical products is 12 months. When properly stored in unopened, sealed containers, the shelf life is indefinite. It is important to observe good inventory control by using the first in, first used practice.

When it becomes necessary to remove supply lines, always add dry nitrogen or dry air (dew point of less than -40°C [-40°F]) when the partially full container is resealed to protect the contents from moisture.

### Disposal

Care should be taken to protect our environment. The user of this product has the responsibility to dispose of unused material or residue in compliance with local governmental guidelines for the disposal of nonhazardous and hazardous waste.

### Ordering

To place orders or for pricing information, please contact AZON customer support at: email: [info@azonuk.com](mailto:info@azonuk.com) or +44 (0) 1443 814657.

### Technical service

For additional product applications or processing information, please call AZON.

### Health and safety

Safety data sheets and product labels must be reviewed prior to use or handling the material. Ordinary hygienic principles, such as washing the compound from the hands before eating or smoking, should be observed. Hands should be washed with a waterless cleaner followed by soap and water. Avoid breathing of vapors, prolonged contact with the skin, contact with open breaks in the skin and ingestion. Use with adequate ventilation.

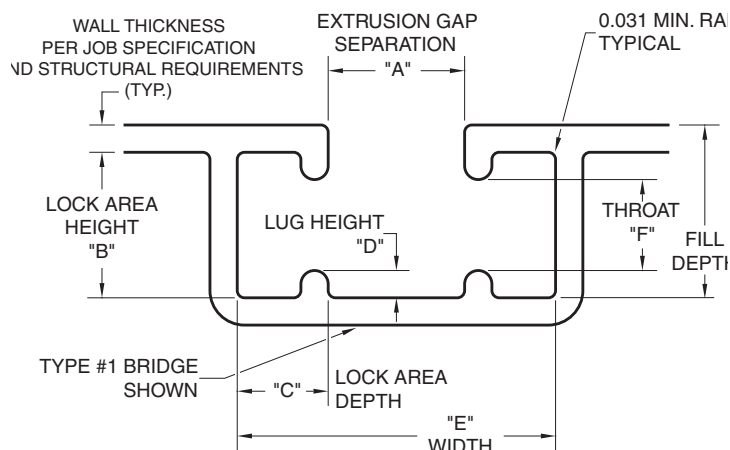
### Cavity design

When designing the pour and debridge cavity in an aluminium extrusion, please refer to your manufacturer's recommendation. Polymer manufacturers can recommend cavity designs to achieve optimal thermal and structural performance for field use. The design in Figure 1 depicts a typical thermal cavity.





**Figure 1: Cavity recommendations**



Cavity data								
Standard designation	"A"	"B"	"C"	"D"	"E"	"F"	Area mm <sup>2</sup> (in <sup>2</sup> )	Volume ml/m (in <sup>3</sup> /ft)
AA	5.18 (0.204)	6.86 (0.270)	2.79 (0.110)	1.02 (0.040)	10.77 (0.424)	4.83 (0.190)	70.96 (0.110)	71 (1.320)
BB	6.35 (0.250)	7.14 (0.281)	4.06 (0.160)	1.14 (0.045)	14.48 (0.570)	4.85 (0.191)	100.65 (0.156)	101 (1.872)
CC	6.35 (0.250)	7.92 (0.312)	4.78 (0.188)	1.27 (0.050)	15.90 (0.626)	5.38 (0.212)	123.23 (0.191)	123 (2.292)
DD	7.92 (0.312)	8.89 (0.350)	5.49 (0.216)	1.57 (0.062)	18.90 (0.744)	5.74 (0.226)	165.81 (0.257)	166 (3.084)
EE	9.53 (0.375)	9.53 (0.375)	5.74 (0.226)	1.57 (0.062)	21.01 (0.827)	6.38 (0.251)	199.35 (0.309)	199 (3.708)
Conceptual designation								
FF	11.10 (0.437)	11.10 (0.437)	6.68 (0.263)	1.85 (0.73)	24.49 (0.964)	7.39 (0.291)	279.35 (0.433)	279 (5.196)
GG	11.54 (0.453)	11.54 (0.453)	6.93 (0.273)	1.91 (0.075)	25.40 (1.000)	7.67 (0.302)	299.35 (0.464)	300 (5.568)
HH	12.70 (0.500)	9.53 (0.375)	5.74 (0.226)	1.57 (0.062)	24.18 (0.925)	6.35 (0.250)	240.00 (0.372)	240 (4.464)
II	12.70 (0.500)	12.70 (0.500)	7.65 (0.301)	2.11 (0.083)	28.00 (1.102)	8.48 (0.334)	364.51 (0.565)	365 (6.780)
JJ	19.05 (0.750)	19.05 (0.750)	11.48 (0.452)	3.18 (0.125)	41.99 (1.653)	12.70 (0.500)	820.64 (1.272)	821 (15.264)
KK	25.40 (1.000)	25.40 (1.000)	15.29 (0.602)	4.24 (0.167)	56.00 (2.205)	16.94 (0.667)	1,458.71 (2.261)	1,459 (27.132)

**NOTES:**

AA - EE STANDARD AAMA CAVITY SIZES

FF - KK SCALED VARIATION OF AAMA POCKETS FOR WIDTH "E"

**WARRANTY** The information contained in this document is to assist customers in determining whether our products are suitable for their applications. Our products are intended for sale to industrial and commercial customers. The customer must inspect and test our products before use, and satisfy themselves as to the contents and suitability. Nothing herein shall constitute a warranty, expressed or implied, including any warranty of merchantability or fitness, nor is protection from any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is replacement of our materials, and in no event shall we be liable for special, incidental or consequential damages.

