

**AM162 EXTRUDED
AIBeMet[®] MATERIAL**

Effective: December 12, 2011

Rev B

1. SCOPE

- 1.1. This specification covers an aluminum-beryllium alloy in the form of bars, rods, tubing, and shapes consolidated from powder by extrusion. The alloy contains nominally 62 weight % beryllium and is produced by powder metallurgy processes.

2. CHEMICAL COMPOSITION

- 2.1. The chemical composition shall conform to the following:

Element	Weight %	Weight %
	Maximum	Minimum
Aluminum	-----Balance-----	
Beryllium	64.0	60.0
Oxygen	1.0	0.0
Carbon	0.1	0.0
Other Metallics, each	0.2	0.0

- 2.2. Beryllium shall be determined by titration, Oxygen by Leco inert gas fusion, Carbon by Leco combustion, other metallics by spectrochemical methods, and aluminum by difference.

- 2.3. Chemical analysis will be performed on a powder blend basis.

3. DENSITY

- 3.1. The bulk density shall range between two values. The density range for all AM162 is listed below:

MATERIAL	Density in g/cm ³	(lbs/in ³)
	Minimum	Maximum
AM162	2.071 (0.0748)	2.122 (0.0767)

- 3.2. Density shall be determined using the water displacement method.
- 3.3. The density of the extrusion shall be determined after a heat treatment of 24 hours \pm 2 hours at 593°C \pm 25°C (1100°F \pm 45°F).

4.MECHANICAL PROPERTIES

- 4.1. Minimum longitudinal tensile properties of AM162 at room temperature, as determined in accordance with ASTM E-8:

<u>PROPERTY</u>	<u>AM 162 Extrusion</u>
Ultimate Strength MPa (Ksi)	379 (55)
Yield Strength Mpa (Ksi)	276 (40)
% Elongation	7

- 4.2. Mechanical properties shall be determined for each material lot. Material lots are defined as follows:

Each combination of powder blend, extrusion session, and heat treatment.

Tensile data will be obtained from representative material tested parallel (longitudinal) to the extrusion direction. Transverse material properties can be tested if agreed to on the sales order. Sufficient material must be available to obtain standard ASTM E-8 tensile specimens.

- 4.3. All mechanical testing will be done on material subjected to a heat treatment of 24 hours \pm 2 hours at 593°C \pm 25°C (1100°F \pm 45°F).

5.TOLERANCES

- 5.1. Materials furnished under this specification shall conform to the dimensions and dimensional tolerances as established by the purchase order and applicable drawings. If tolerances are not specified by purchase order, the following standard tolerances for extruded components shall apply employing ANSI 14.5M:

<u>Diameter, Width or Thickness</u>	<u>Tolerance</u>
3.81mm to 76.2mm (0.150" to 3"), inclusive	-0+3.175mm (-0+0.125")
Over 76.2mm to 508mm (Over 3")	-0+6.350mm (-0+0.250")

<u>Length</u>	<u>Tolerance</u>
All Lengths	-0+6.350mm (-0+0.250")

<u>ID</u>	<u>Tolerance</u>
3.81mm to 76.2mm (0.150" to 3"), inclusive	+0-3.175mm (+0-0.125")
Over 76.2mm to 508mm (Over 3")	+0-6.350mm (+0-0.125")

- 5.2. Standard straightness of extrusion shall be $\pm 3.175\text{mm}$ per 30.5 cm ($\pm 0.125''$ per foot) per foot of length.
- 5.3. Corners may be rounded. Consult with Sales.

6.SURFACE FINISH

- 6.1. Materials furnished under this specification shall conform to the surface finish established by the purchase order and applicable drawings. If no surface finish is specified, the material shall be furnished with an as-fabricated surface.

7.REPORTS

- 7.1. Certification of Compliance with this specification will be furnished on request. Other information can be provided, including actual test results and calculations, when specified in the purchase order. Testing in accordance with individual customer instructions will be performed if mutually acceptable and actual test results will be provided.

8. MARKING

- 8.1. Each lot material shipped to the customer will be appropriately identified, tagged, packaged and labeled to include the following:

Materion Brush Inc.

Lot Number

Specification Number

Purchase Order Number

Warning Beryllium

Product MSDS and Corresponding Shipping Label

- 8.2. Additional marking and serialization can be performed at customer request.

9. SAFETY / ENVIRONMENTAL

- 9.1. Beryllium containing materials may pose a health risk if recommended safe handling practices are not followed. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) has set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the product specific Material Safety Data Sheet (MSDS) before working with this material. For additional information on safe handling practices or technical data contact your Materion Brush Inc. representative.

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