SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS7909 REV. A

Issued 2005-07
Cancelled 2010-12

Superseding AMS7909

Aluminum Beryllium, NNS Preforms
Hot Isostatic Pressed
38Al - 62Be

RATIONALE

AMS7909A has been designated Cancelled based on results of a survey to aerospace users and producers that the product is not being produced.

CANCELLATION NOTICE

This specification has been declared “CANCELLED” by the Aerospace Materials Division SAE, as of December 2010. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications indicating that it has been “CANCELLED”.

Cancelled specifications are available from SAE.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS7909A

1. SCOPE:

1.1 Form:

This specification covers aluminum-beryllium powders consolidated by hot isostatic pressing (HIP) into the form of blocks, blanks or shapes.

1.2 Application:

These preforms have been used typically for parts requiring high thermal conductivity, low density and high modulus of elasticity, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards that may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.3.1 WARNING: Beryllium Alloy: Inhaling dust or fumes may cause chronic beryllium disease, a serious chronic lung disease, in some individuals. Cancer hazard. Over time, lung disease and cancer can be fatal. Target organ is primarily the lung.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superceding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2806 Identification, Bars, Wire Mechanical Tubing, and Extrusions, Carbon and Alloy Steel and Heat and Corrosion Resistant Steels and Alloys.

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM B 311 Density of Cemented Carbides
ASTM E 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)

2.3 ANSI Publications:

Available from American National Standards Institute, Inc., 25 West 43rd Street, New York, New York, 10036 or www.ansi.org.

ANSI B46.1 Surface Texture, Surface Roughness, Waviness, and Lay
ANSI Y14.5M Dimensioning and Tolerancing

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1; beryllium shall be determined by wet analysis (titration) or optical emission spectrometry, oxygen by inert gas fusion, and other elements by spectrochemical methods or by other analytical methods acceptable to purchaser.

TABLE 1 – Composition

Element	min	max
Beryllium	60.0	64.0
Oxygen	--	1.0
Carbon (3.1.2)	--	0.1
Other Metallics, each (3.1.2)		0.2
Aluminum (3.1.1)	remainder	

3.1.1 Aluminum may be reported as “remainder”, or as the difference between the sum of results for all elements and 100%, or as the result of direct analysis.

3.1.2 Determination is not required for routine acceptance of each lot.

3.2 Condition:

Hot isostatically pressed (HIP) (See 8.2).

3.2.1 Surface Finish: If no surface finish is specified, the material shall be furnished with an as-sawed, as-HIP and/or machined surface. Machined surfaces shall have surface finish no greater than 110 Ra (3.2 um), determined in accordance with ANSI B46.1.

3.3 Properties:

The product shall conform to the following requirements.

3.3.1 Tensile Properties: Shall be as shown in Table 2, determined at room temperature in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	42.0 ksi (289 MPa)
0.2% Offset Yield Strength	28.0 ksi (193 MPa)
Elongation	3%

Subsequent exposure to elevated temperature above 950 °F (510 °C), for example secondary operations such as thermal stress relief, brazing or welding, may alter tensile properties.

3.3.2 Density: Shall be within the range of 2.071 to 2.122 g/cm^3 (0.0748 to 0.0767 lb/in^3), determined using a water displacement method in accordance with ASTM B 311 except that measurement shall be made on the product, not a sample.

3.4 Quality:

Preforms, as received by purchaser, shall be uniform in quality and condition and shall be free from imperfections detrimental to usage of the preforms.

3.5 Tolerances:

Shall conform to +0.250/-0.000 inch (+6.35/-0.00 mm) unless specified by agreement between purchaser and supplier (See 8.3).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of the Tests:

All technical requirements are acceptance tests and shall be performed on each lot or each powder blend, as applicable.

4.3 Sampling and Testing:

Shall be in accordance with the following: a lot shall consist of all preforms manufactured from a specific powder blend and HIP cycle. Mechanical properties may be determined from a sample shape (component) or from material produced as an integral part (prolongation) of a shape (component) from the lot.

4.3.1 Composition: One or more samples from each powder blend. A powder blend is comprised of thoroughly intermingled powders of the same nominal composition.

4.3.2 Tensile Properties: One or more round tensile specimens from each lot at any location.

4.3.3 Density: One sample from each lot (see 3.3.2), unless a sampling plan has been agreed upon by purchaser and vendor.

4.3.4 Dimensions: Each piece, unless a sampling plan has been agreed upon by purchaser and vendor.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the results of tests for composition, tensile properties and density of each lot. This report shall include the purchase order number, lot number, AMS 7909, serial numbers, and quantity.

4.5 Resampling and Retesting:

If a valid test on any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing two additional specimens for each original nonconforming specimen, except as permitted by 4.5.1. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented. Results of all tests shall be reported.

4.5.1 Resubmittal of Rejected Lots: Lots rejected for failure to meet the technical requirements may be submitted for retesting provided the producer has reworked the lots, as necessary, to correct the deficiencies or when 100% inspection confirms removal of nonconforming details.