AN AMERICAN NATIONAL STANDARD

The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

# AEROSPACE MATERIAL SPECIFICATION

SAE AMS 7878B

Issued May 1971
Revised Mar 1994

Superseding AMS 7878A

Submitted for recognition as an American National Standard

## TUNGSTEN CARBIDE POWDER
## Cobalt Coated

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of March 1994. It is recommended, therefore, that this specification not be specified for new designs.

This cover sheet should be attached to the "A" revision of the subject specification.

"NONCURRENT" refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these "NONCURRENT" specifications is available from SAE upon request.



PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "G"

The Engineering Society For Advancing Mobility Land Sea Air and Space

400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

# AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 7878A

Issued 5-15-71
Revised 4-1-87

Superseding AMS 7878



## TUNGSTEN CARBIDE POWDER
Cobalt Coated



1. SCOPE:

1.1 Form: This specification covers cobalt-coated tungsten carbide in the form of powder.

1.2 Application: Primarily for producing plasma spray coatings to provide wear and fretting resistant surfaces.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B214 - Sieve Analysis of Granular Metal Powders
ASTM B215 - Sampling Finished Lots of Metal Powders

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Powder particles shall consist of a tungsten carbide core enclosed in a cobalt jacket. Composition shall conform to the following percentages by weight, determined by methods agreed upon by purchaser and vendor:

| | min | max |
|---|---|---|
| Free Carbon (3.1.1) | -- | 0.03 |
| Combined Carbon | 6.12 | 6.15 |
| Total Carbon | 6.12 | 6.18 |
| Cobalt | 10.50 | 13.50 |
| Iron | -- | 0.05 |
| Other Impurities, each (3.1.1) | -- | 0.01 |
| Other Impurities, total (3.1.1) | -- | 0.15 |
| Tungsten | remainder | |

3.1.1 Determination not required for routine acceptance.

3.2 Condition: As manufactured.

3.3 Properties: Powder shall conform to the following requirements:

3.3.1 Particle Size Distribution: Powder shall be supplied with the following particle size distribution. Sieve analysis shall be conducted in accordance with ASTM B214; subsieve (micron) analysis shall be conducted in accordance with a method approved by purchaser.

| Mesh or Micron Size* | | % By Weight min | % By Weight max |
|---|---|---|---|
| -270 mesh | (46 µm) | 100.0 | -- |
| +325 mesh | (45 µm) | -- | 0.5 |
| -30 µm | | 80.0 | -- |
| -20 µm | | -- | 20 |

* + indicates retained on sieve
- indicates passing through sieve

3.3.2 Plasma Spraying: Powder shall produce acceptable spray coatings; standards for acceptance and method of test shall be as agreed upon by purchaser and vendor.

3.4 Quality: Powder, as received by purchaser, shall be thoroughly blended, uniform in color and quality, dry, and free from foreign materials and from imperfections detrimental to its spraying qualities.

4.1 QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of powder shall supply all samples
Ø for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the powder conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical
Ø requirements of this specification are classified as acceptance tests and as preproduction tests and shall be performed prior to or on the initial shipment of powder to a purchaser, on each lot, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.1 For direct U.S. Military procurement, substantiating test data and, when
Ø requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with ASTM B215; sufficient powder shall be
Ø taken from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1 When a statistical sampling plan and acceptance quality level (AQL) have
Ø been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3 and the report of 4.5.1 shall state that such plan was used.

4.4 Approval:

4.4.1 Sample powder shall be approved by purchaser before powder for production use is supplied, unless such approval be waived by purchaser. Results of tests on production powder shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use materials, processing techniques, and methods of
Ø inspection on production powder which are essentially the same as those used on the approved sample powder. If necessary to make any change in ingredients, processing techniques, or methods of inspection, vendor shall submit for reapproval a statement of the proposed changes in material, processing, or both and, when requested, sample powder. Production powder made by the revised procedure shall not be shipped prior to receipt of reapproval.