



AEROSPACE MATERIAL SPECIFICATION

AMS7882™**REV. D**Issued 2003-04
Revised 2021-10

Superseding AMS7882C

**Tungsten Carbide-Cobalt Chrome Powder
Agglomerated and Sintered**

RATIONALE

AMS7882D is the result of the need to address a new powder type. The new type of powder (Method 5) is added (3.3.1, Tables 2 and 3, and 8.3). The revision includes updates to the industry (8.3), country of origin (4.5), packaging requirements (5.1.2), and product exceptions (8.8, 8.9).

1. SCOPE

1.1 Form

This specification covers tungsten carbide-cobalt chrome in the form of powder.

1.2 Application

1.2.1 This powder has been used typically for producing thermal spray coatings to provide wear and fretting resistant surfaces with a high level of corrosion resistance, but usage is not limited to such applications. Powders can be applied using various types of commercial thermal spray systems (see 8.3).

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 superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2448 Application of Tungsten Carbide Coatings on Ultra-High Strength Steels, High Velocity Oxygen/Fuel Process

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

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For more information on this standard, visit
<https://www.sae.org/standards/content/AMS7882D/>

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B215 Sampling Metal Powders

ASTM B822 Particle Size Distribution of Metal Powders and Related Compounds by Light Scattering

ASTM MNL32 Test Sieving Methods

3. TECHNICAL REQUIREMENTS

- 3.1 Composition shall conform to the percentages by weight shown in Table 1, determined by methods acceptable to the cognizant engineering organization.

Table 1 - Composition, percent by weight

Element	Minimum %	Maximum %
Cobalt	8.5	11.5
Chromium	3.0	5.0
Tungsten	Balance	
Carbon, total	3.2	5.5
Iron	—	1.0
Others (if determined)	—	2.5

- 3.2 Condition shall be as manufactured.

- 3.3 Properties

Powder shall conform to the following requirements:

- 3.3.1 Particle size distribution shall be as shown in Tables 2 or 3. Each lot shall show the cumulative Table 2 volume percentages when measured by laser light scattering method in accordance with ASTM B822 or another method permitted by the cognizant engineering organization. See 8.2. Alternatively, for Method 1, 2, or 3 powder, each lot shall have the cumulative Table 3 weight percentages by sieve size using ASTM MNL32 as a guide or other method permitted by the cognizant engineering organization. (Sieve size evaluation is not applicable to Method 4 powder.) Required distribution percentages vary by application method. See 8.3.

Table 2 - Particle size distribution by application method

Percent by volume, application Method 1

Micron Size	Minimum %	Maximum %
+62	—	10
+44	18	35
+22	60	95
+11	92	—

Percent by volume, application Method 2

Micron Size	Minimum %	Maximum %
+62	—	5
+44	5	25
+22	75	95
+11	98	—

Percent by volume, application Method 3

Micron Size	Minimum %	Maximum %
+62	—	10
+44	—	35
+22	45	75
+11	85	—

Percent by volume, application Method 4

Micron Size	Minimum %	Maximum %
+62	—	0
+44	—	1
+22	20	35
+11	85	—

Percent by volume, application Method 5

Micron Size	Minimum %	Maximum %
+62	—	0
+44	—	1
+22	20	35
+11	85	—

Table 3 - Particle sieve size distribution by application method**Percent by weight, application Methods 1 and 2**

Sieve Size	Minimum %	Maximum %
+270	—	5%
+325	—	25%

Percent by weight, application Method 3

Sieve Size	Minimum %	Maximum %
+270	—	2%
+325	—	5%

Percent by weight, application Method 5

Sieve Size	Minimum %	Maximum %
+270	—	2%
+325	—	5%

3.3.2 Thermal spraying powder shall be capable of producing thermal spray coatings that meet the requirements of AMS2448 or alternative requirements specified by the cognizant engineering organization.

3.4 Quality

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

3.5 Exceptions

Any exception shall be authorized by purchaser and reported as in 4.5.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The supplier of powder shall provide all samples for supplier's tests and shall be responsible for the performance of all required tests. The cognizant engineering organization reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the powder conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

All technical requirements except 3.3.2 (spraying capability) are acceptance tests, and shall be performed on each heat or lot as applicable.

4.2.2 Preproduction Tests

All technical requirements are 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 ingredients and/or processing requires approval by the cognizant engineering organization (see 4.4.2), and when the cognizant engineering organization deems confirmatory testing to be required.

4.2.3 Periodic Tests

Spraying capability (3.3.2) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and testing shall be in accordance with ASTM B215 or alternative in accordance with 4.3.1. Sufficient powder shall be 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 The cognizant engineering organization and supplier may agree upon an alternative statistical sampling plan.

4.4 Approval

4.4.1 The process and control procedures, a preproduction sample, or both, whichever is specified, shall be approved by the cognizant engineering organization before production powder is supplied.

4.4.2 If the supplier makes a significant change to any ingredient, process, or control from that which was used for approval, all tests shall be performed, and the results submitted to the cognizant engineering organization for reapproval. A significant change is one which, in the judgment of the cognizant engineering organization, could affect the properties or performance of the powder.

4.5 Reports

The supplier of a powder shall furnish with each shipment a report showing the producer's name and country where the metal was melted (e.g., final melt in the case of metal processed by multiple melt operations) and the results of tests for composition and particle size distribution of each lot and stating that the powder conforms to other technical requirements. The report shall include the purchase order number, lot number, AMS7882D, supplier's product designation, quantity, and the details of any alternative sampling plan established in accordance with 4.3.1.

4.5.1 When material produced to this specification has authorized exceptions taken to the technical requirements listed in Section 3 (see 5.1.3), the report shall contain a statement "This material is certified as AMS7882D(EXC) because of the following exceptions:" and the specific exceptions shall be listed.

4.6 Resampling and Retesting

If any sample used in the above tests fails to meet the specified requirements, disposition of the powder may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the powder represented. Results of all tests shall be reported.