

SAE Aerospace An SAE International Group	AEROSPACE MATERIAL SPECIFICATION	AMS 7882A	
		Issued Revised	APR 2003 JUN 2007
		Superseding AMS 7882	
Tungsten Carbide-Cobalt Chrome Powder Agglomerated and Sintered			

RATIONALE

AMS 7882A adds requirements relative to several types of application equipment.

1. SCOPE

1.1 Form

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

1.2 Application

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.

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 724-776-4970 (outside USA), www.sae.org.

AMS 2448 Application of Tungsten Carbide Coatings on Ultra-high Strength Steels, High Velocity Oxygen/Fuel Process

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 B 215 Sampling Finished Lots of Metal Powders
ASTM B 822 Particle Size Distribution of Metal Powders and Related Compounds by Light Scattering
ASTM Manual 32 Manual on Test Sieving Methods

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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 BY WEIGHT
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 and 3. Each lot shall show the cumulative Table 2 volume percentages when measured by laser light scattering method in accordance with ASTM B 822 or other method acceptable to the cognizant engineering organization. See 8.2. Each lot shall have the cumulative Table 3 weight percentages using ASTM Manual 32 as a guide or other method acceptable to the cognizant engineering organization. Measured distribution percentages can vary by application method. See 8.3.

TABLE 2 - PARTICLE SIZE DISTRIBUTION

Percent by Volume, Method 1

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

Percent by Volume, Method 2

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

Percent by Volume, Method 3

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

TABLE 3 - PARTICLE SIZE DISTRIBUTION BY SIEVE SIZE

Percent by Weight, Methods 1 and 2		
Sieve Size	Minimum %	Maximum %
+270	--	5%
+325	--	25%

Percent by Weight, Method 3		
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 AMS 2448 or alternative requirements acceptable to 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.

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

Tests for all technical requirements are acceptance tests and 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.

4.3 Sampling and testing shall be in accordance with ASTM B 215 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 purchaser for reapproval unless the change is approved by the cognizant engineering organization. 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 results of tests for chemical 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, AMS 7882A, supplier's product designation, quantity and the details of any alternative sampling plan established in accordance with 4.3.1.

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.

5. PREPARATION FOR DELIVERY

5.1 Packaging and Identification

5.1.1 Powder shall be packaged in sealed containers to protect it from contamination during shipment and under normal dry storage conditions. Seals used on containers shall be so designed that they must be destroyed in order for the container to be opened.

5.1.2 Each individual container shall be legibly identified with not less than the following information, using characters that will not be obliterated by normal handling:

TUNGSTEN CARBIDE-COBALT CHROME POWDER
AMS 7882A
MANUFACTURER'S IDENTIFICATION
PURCHASE ORDER NUMBER
QUANTITY
LOT NUMBER

5.1.3 Containers of powder shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the powder to ensure carrier handling and safe delivery.

6. ACKNOWLEDGMENT

A supplier shall mention AMS 7882A in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Powder not conforming to this specification, or to modifications authorized by the cognizant engineering organization, will be subject to rejection.

8. NOTES

8.1 A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of a specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revision. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Microtrac Analysis

A specific method of particle parameter determination using low angle forward and/or 90° light scattering (Fraunhofer Diffraction) and associated instrumentation, data reduction hardware and software.