

Submitted for recognition as an American National Standard

**TUNGSTEN CARBIDE-COBALT POWDER  
Cast and Crushed**

**1. SCOPE:**

**1.1 Form**

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

**1.2 Application:**

**This powder has been used typically for producing plasma spray coatings to provide wear and fretting resistant surfaces, but usage is not limited to such applications.**

**2. APPLICABLE DOCUMENTS:**

**The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.**

**2.1 ASTM Publications:**

**Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.**

**ASTM B 214 Sieve Analysis of Granular Metal Powders  
ASTM B 215 Sampling Finished Lots of Metal Powders**

**2.2 U.S. Government Publications:**

**Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.**

**ML-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements**

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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 purchaser.

**TABLE 1 - Composition**

<b>Element</b>	<b>min</b>	<b>max</b>
<b>Carbon</b>	<b>3.90</b>	<b>4.30</b>
<b>Cobalt</b>	<b>10.00</b>	<b>12.00</b>
<b>Iron</b>	--	<b>2.00</b>
<b>Tungsten</b>	<b>remainder</b>	

**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 B 214; subsieve (micron) analysis shall be conducted in accordance with a method approved by purchaser.

**TABLE 2 - Particle Size Distribution**

<b>Mesh or Micron Size*</b>	<b>Percent By Weight min</b>	<b>Percent By Weight max</b>
<b>- 270 mesh (46 µm)</b>	<b>100.0</b>	--
<b>+325 mesh (45 µm)</b>	--	<b>0.5</b>
<b>- 20 µm</b>	<b>70.0</b>	--
<b>- 5 µm</b>	--	<b>10</b>

\* + 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 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. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for Inspection:

(R)

The vendor of powder 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 powder conforms to the requirements of this specification.

### 4.2 Classification of Tests:

(R)

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 purchaser deems confirmatory testing to be required.

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

### 4.3 Sampling and Testing:

(R)

Shall be in accordance with ASTM B 215; 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 When a statistical sampling plan has 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 shall state that such plan was used.

### 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 The supplier shall make no significant change in ingredients, processes, or controls from those on which the approval was based, 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 vendor of 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 the other technical requirements. This report shall include the purchase order number, lot number, AMS 7879C, vendor's product designation, and quantity.

**4.6 Resampling and Retesting:**  
**(R)**

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 5-pound (2.5-kg) 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 which will not be obliterated by normal handling:**

**TUNGSTEN CARBIDE-COBALT POWDER**  
**AMS 7879C**  
**MANUFACTURER'S IDENTIFICATION** \_\_\_\_\_  
**PURCHASE ORDER NUMBER** \_\_\_\_\_  
**QUANTITY** \_\_\_\_\_  
**LOT NUMBER** \_\_\_\_\_

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

**5.1.4 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-2073-1, Commercial Level, unless Level A is specified in the request for procurement.**

**6. ACKNOWLEDGMENT:**

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.