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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 7875B

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Superseding AMS 7875A

POWDER, CHROMIUM CARBIDE PLUS NICKEL-CHROMIUM ALLOY
$75Cr_2C_3$ + 25(80Ni - 20Cr Alloy)

1. SCOPE:

1.1 Form: This specification covers a blend of chromium carbide and a nickel-chromium alloy 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
ASTM E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys
ASTM E363 - Chemical Analysis of Chromium and Ferrochromium

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 Material: Shall be a blend of 74.00 - 76.00% by weight chromium carbide and 24.00 - 26.00% by weight nickel-chromium alloy powders. The component powders, prior to blending, shall conform to the compositions of 3.2.1 and 3.2.2, respectively, and shall have particle size distribution as shown in 3.4.1 for each component powder.

3.2 Composition: Shall conform to the following percentages by weight, Ø determined by wet chemical methods in accordance with ASTM E363 for the chromium carbide and ASTM E354 for the nickel-chromium alloy, or by spectrographic or other analytical methods approved by purchaser:

3.2.1 Chromium Carbide:

	min	max
Total Carbon	12.50	--
Silicon	--	0.10
Chromium	85.50	--
Iron	--	0.70

3.2.2 Nickel-Chromium Alloy:

	min	max
Carbon	--	0.25
Manganese	--	2.50
Silicon	--	1.50
Chromium	18.00	22.50
Nickel	76.00	80.00
Iron	--	1.00

3.2.3 When specified, vendor shall supply purchaser with an adequate quantity of component materials (See 3.2.1 and 3.2.2) for quality control checks.

3.3 Condition: As blended.

3.4 Properties: Powder shall conform to the following requirements:

3.4.1 Particle Size Distribution: Each component powder shall have the following
Ø particle size distribution, determined before blending. Sieve analysis shall be conducted in accordance with ASTM B214; sub-sieve analysis shall be in accordance with an optical method agreed upon by purchaser and vendor.

Chromium Carbide % by Wt			Nickel-Chromium Alloy % by Wt	
min	max	Mesh or Micron Size*	min	max
100	--	-270 mesh (46 μm)	100	--
--	1	+325 mesh (45 μm)	--	1
60	90	-20 μm	45	75
--	15	-5 μm	--	5

* + indicates retained on sieve
- indicates passing through sieve

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

3.5 Quality: The component powders shall be thoroughly blended. The blend, as received by purchaser, shall be 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: The vendor of the product shall supply all
Ø samples for vendor's test 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 product 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 requirements shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1 A lot shall be all powder produced in a single production run from the same batches of raw materials under the same fixed conditions and presented for vendor's inspection at one time. A lot may be packaged and delivered in small quantities under the basic lot approval provided lot identification is maintained.

4.3.2 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 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.

4.5 Reports:

4.5.1 The vendor of powder shall furnish with each shipment a report showing the results of tests for chemical composition and the particle size distribution of each lot and stating that the powder conforms to the other technical requirements of this specification. This report shall include the purchase order number, AMS 7875B, vendor's product designation, lot number, and quantity.

4.5.2 When coated parts requiring use of this powder are supplied, the vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 7875B, lot number, contractor or other direct supplier of powder, part number, and quantity. When powder for coating parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of powder to determine conformance to the requirements of this specification and shall include in the report either a statement that the powder conforms or copies of laboratory reports showing the results of tests to determine conformance.