Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 7875A
Superseding AMS 7875

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CHROMIUM CARBIDE PLUS NICKEL-CHROMIUM ALLOY POWDER
$75Cr_2C_3$ + 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 (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, New York 10001.

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, Pennsylvania 19103.

ASTM B214 - Sieve Analysis of Granular Metal Powders
ASTM B293 - Subsieve Analysis of Granular Metal Powders by Air Classification
ASTM E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt-Base Alloys
ASTM E363 - Chemical Analysis of Ferrochromium and Chromium Metal

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

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

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, determined by wet chemical methods in accordance with ASTM E363 for the chromium carbide and ASTM E354 for the nickel-chromium alloy, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

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:

3.4.1 Particle Size Distribution: Each component powder shall have the following particle size distribution, determined before blending. Sieve analysis shall be conducted in accordance with ASTM B214; sub-sieve (micron) analysis shall be in accordance with ASTM B293 or by an approved optical method.

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

* + indicates retained on sieve
- indicates passing through sieve

3.4.2 Plasma Spraying: Powder shall be capable of producing acceptable plasma spray coatings to standards agreed upon by purchaser and vendor.

3.5 Quality: The component powders shall be thoroughly blended. The blend 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 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 perform such confirmatory testing as he deems necessary to assure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to material (3.1), composition (3.2), and particle size distribution (3.4.1) requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine conformance to plasma spraying (3.4.2) requirements are classified as qualification or periodic control tests.

4.3 Sampling: Sufficient material shall be taken from each lot to perform each acceptance test.

4.3.1 Lot: A lot shall be all material produced in a single production run from the same batch of raw materials under the same fixed conditions and presented for inspection at one time. A lot may be packaged in smaller quantities and delivered separately under the basic lot approval as long as lot identity is maintained.

4.4 Approval:

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

4.4.2 Vendor shall use ingredients, processing techniques, and methods of routine inspection on production material which are essentially the same as those used on the approved sample powder. If any change is necessary in ingredients, processing techniques, or methods of routine inspection, vendor shall submit a sample for reapproval unless purchaser grants written approval after review of a detailed statement of materials and processes used on the approved sample and those proposed. No production material made by the revised procedure shall be shipped prior to receipt of approval of such procedure.

4.5 Reports:

4.5.1 The vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, and quantity.

4.5.2 When coated parts requiring the use of this powder are supplied, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, this specification number and its revision letter, 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 a statement that the powder conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.6 Resampling and Retesting: If any sample used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each container shall be permanently and legibly marked to give the following information:

CHROMIUM CARBIDE - NICKEL-CHROMIUM ALLOY POWDER
AMS 7875A
MANUFACTURER'S IDENTIFICATION_____
QUANTITY_____
LOT NO._____