SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 7875C

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Superseding AMS 7875B

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:

This product 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 issue of the following documents in effect on the date of the purchase order form 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 214 Sieve Analysis of Granular Metal Powders
ASTM B 215 Sampling Finished Lots of Metal Powders
ASTM C 1070 Determining Particle Size Distribution of Alumina or Quartz by Laser Light Scattering
ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys
ASTM E 363 Chemical Analysis of Chromium and Ferrochromium

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a blend of 74.00 to 76.00% by weight chromium carbide and 24.00 to 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 percentages by weight shown in Tables 1 and 2, determined by wet chemical methods in accordance with ASTM E 363 for the chromium carbide and ASTM E 354 for the nickel-chromium alloy, or by spectrographic or other analytical methods approved by purchaser:

3.2.1 Chromium Carbide:

TABLE 1 - Composition

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

3.2.2 Nickel-Chromium Alloy:

TABLE 2 - Composition

Element	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 particle size distribution shown in Table 3, determined before blending. Sieve analysis shall be conducted in accordance with ASTM B 214; sub-sieve analysis shall be in accordance with ASTM C 1070 or other optical method agreed upon by purchaser and vendor.

TABLE 3 - Particle Size Distribution

Chromium Carbide % by Wt min	Chromium Carbide % by Wt max	Mesh or Micron Size[1]	Nickel-Chromium Alloy % by Wt min	Nickel-Chromium Alloy % by Wt max
100	--	-270 mesh (46 µm)	100	--
--	1	+325 mesh (45 µm)	--	1
50	70	-22 µm	45	75
--	10	-5.5 µm	--	5

[1] +indicates retained on sieve
- indicates passing through sieve

3.4.2 Plasma Spraying: Powder shall produce acceptable plasma spray coatings; 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 samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the specified requirements.

4.2 Classification of Tests:

All technical requirements of this specification 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 material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

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 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 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:

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 7875C, vendor's product designation, lot number, and quantity.