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Superseding AMS5793A

Powder, Plasma Spray
95Ni - 5Al

RATIONALE

AMS5793B has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

This specification covers a nickel-aluminum aggregate in the form of powder.

1.2 Application

This powder has been used typically as an undercoat for plasma spray coatings, as a constituent in plasma spray powders, or for dimensional buildup, but usage is not limited to such applications.

1.3 Classification

Powder supplied to this specification is classified as follows:

Type 1 - Prealloyed powder, produced by atomization of 95% Nickel, 5% Aluminum alloy.

Type 2 - Composite powder, produced by cladding fine aluminum particles to a textured nickel core powder with the use of a suitable binder system.

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.

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on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS5793B>**

2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, or www.astm.org.

ASTM B 214	Sieve Analysis of Granular Metal Powders
ASTM B 215	Sampling Finished Lots of Metal Powders
ASTM C 117	Material Finer Than 75- μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM E 1473	Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys

3. TECHNICAL REQUIREMENTS

3.1 Composition

The powder shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 1473, spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - COMPOSITION

Element	min	max
Aluminum	4.0	5.5
Impurities, Total (3.1.1)	--	2.50
Nickel	remainder	

3.1.1 Applicable to Type 2 powder only, shall be present as volatile phenolic binder.

3.2 Properties

Powder shall conform to the following requirements:

3.2.1 Particle Size Determination

Powder shall be supplied with the particle size distribution shown in Table 2. Sieve analysis shall be conducted in accordance with ASTM B 214 or ASTM C 117; the method of testing used shall be reported.

TABLE 2 - MINIMUM PARTICLE SIZE DETERMINATION

U.S. Sieve Size	% by weight	
	min	max
Retained on No. 140 (106 μm)	--	0.5
Retained on No. 170 (90 μm)	--	5.0
Retained on No. 325 (45 μm)	90	--

3.2.2 Flowability

Powder shall be visually examined for free flowing through a suitable powder feeder and spray gun. The powder stream shall allow the flow to be consistent and without excessive pulsation.

3.2.3 Plasma Spraying

Powder shall produce acceptable plasma spray coatings; standards for acceptance and method of test may be agreed upon by purchaser and vendor.

3.3 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

The vendor of powder 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 powder conforms to specified requirements.

4.2 Classification of Tests

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 reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing

4.3.1 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.

4.3.1.1 A lot shall be all powder produced in a single production run from the same batch of raw materials under the same fixed conditions and presented for vendor's inspection at one time.

4.3.1.2 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 4.3.1 and the report of 4.5 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 is waived by purchaser. Results of tests on production powder shall be essentially equivalent to those on the approved sample powder.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production powder that are essentially the same as those used on the approved sample powder. If necessary to make any change in ingredients, in type of equipment for processing, in manufacturing or inspection procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and/or processing 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 for each lot a report showing the composition, the method of testing used to determine particle size, and stating that the powder conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 5793B, vendor's powder designation, and quantity.

4.6 Resampling and Retesting

If any specimen 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 specimens for each original nonconforming specimen. Failure of any retest specimen 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 Identification

5.1.1 Powder shall be assigned a distinctive manufacturer's material designation (name, or coded series of letters or numbers as applicable). This designation shall be changed after any change in ingredients, manufacturing procedures, processes, or methods of inspection of the powder.

5.1.2 Each container of powder shall be permanently and legibly marked with not less than the following information:

POWDER, PLASMA SPRAY

AMS 5793B

CLASSIFICATION: Type (See 1.3) _____

MANUFACTURER'S IDENTIFICATION _____

MANUFACTURER'S MATERIAL DESIGNATION _____

LOT NUMBER _____

QUANTITY _____

5.1.3 Each exterior container shall be legibly marked with not less than the following information in such a manner that the markings will not smear or be obliterated during normal handling or use:

POWDER, PLASMA SPRAY

AMS 5793B

CLASSIFICATION: Type (See 1.3) _____

MANUFACTURER'S IDENTIFICATION _____

MANUFACTURER'S MATERIAL DESIGNATION _____

PURCHASE ORDER NUMBER _____

LOT NUMBER _____

QUANTITY _____

5.2 Packaging

5.2.1 Powder shall be packaged in 5 pound (2.3 kg) sealed containers to protect the powder from contamination during shipment and under normal dry storage conditions. Seals used on containers shall be so designed that the seals must be destroyed in order for the container to be opened.

5.2.2 Individual packages or containers shall be packed in an exterior shipping container capable of protecting the powder, during shipment and storage, against damage from exposure to weather or any other normal hazard.

5.2.3 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 acceptance and safe delivery.

6. ACKNOWLEDGMENT

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

7. REJECTIONS

Powder not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.