AEROSPACE MATERIAL SPECIFICATION

AMS5792™	REV. B

Issued 1986-01
Revised 2006-08
Reaffirmed 2018-10

Superseding AMS5792A

Powder, Plasma Spray
50 (88WC - 12Co) + 35 (70Ni - 16.5Cr - 4Fe - 4Si - 3.8B) + 15 (80Ni - 20A1)
Three-Component Mixture

RATIONALE

AMS5792B has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

This specification covers a blend of tungsten carbide-cobalt aggregate, a nickel alloy, and a nickel aluminum aggregate in the form of powder.

1.2 Application

This product has been used typically for producing plasma spray coatings to provide surfaces resistant to wear, corrosion, and abrasion, 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 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. The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://standards.sae.org/AMS5792B

3. TECHNICAL REQUIREMENTS

3.1 Material

Powder shall be a blend of 48 to 52% by weight of tungsten carbide-cobalt aggregate, 14 to 16% by weight of nickel-aluminum aggregate, and the remainder a nickel alloy. The component powders, prior to blending, shall conform to the compositions of 3.2.1, 3.2.2, and 3.2.3, respectively, and shall have particle size distributions as shown in 3.3.1 for each component powder.

3.2 Composition

Powder shall conform to the percentages by weight shown in Table 1, Table 2, and Table 3, determined by wet chemical methods, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

3.2.1 Tungsten Carbide-Cobalt Aggregate

TABLE 1 - COMPOSITION

Element	min	max
Carbon	5.15	--
Cobalt	11.50	13.00
Tungsten	81.00	--
Iron	--	1.5
Other Impurities, each (3.2.1.1)	--	0.50

3.2.1.1 Determination not required for routine acceptance.

3.2.2 Nickel-Aluminum Composite

TABLE 2 - COMPOSITION

Element	min	max
Aluminum	17.00	20.00
Impurities, total (3.2.1.1)	--	1.00
Nickel	remainder	

3.2.3 Nickel Alloy

TABLE 3 - COMPOSITION

Element	min	max
Carbon	0.6	1.3
Silicon	3.0	5.0
Chromium	13.0	20.0
Boron	2.75	4.75
Iron	3.0	5.0
Cobalt (3.2.1.1)	--	1.0
Nickel	remainder	

3.3 Properties

Powder shall conform to the following requirements:

3.3.1 Particle Size Distribution

Each component powder shall have particle size distribution shown in Table 4, determined before blending. Sieve analysis shall be performed in accordance with ASTM B 214 or ASTM C 117; the method of testing used shall be reported.

TABLE 4 - PARTICLE SIZE DISTRIBUTION

U.S. Standard Sieve	Tungsten Carbide-Cobalt Aggregate % by weight minimum	Tungsten Carbide-Cobalt Aggregate % by weight maximum	Nickel-Aluminum Aggregate % by weight minimum	Nickel-Aluminum Aggregate % by weight maximum	Nickel Alloy % by weight minimum	Nickel Alloy % by weight maximum
Passing through 170 (90 µm)	--	--	99	--	--	--
Passing through 200 (75 µm)	--	--	90	--	99	--
Retained on 270 (53 µm)	--	--	80	--	--	20
Retained on 325 (45 µm)	--	5	--	--	--	--

3.3.2 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.

3.3.3 Plasma Spraying

Powder shall produce acceptable plasma spray coatings; acceptance standards and test methods shall be as agreed upon by purchaser and vendor.

3.4 Quality

The component powders shall be thoroughly blended. The blend of powders, 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 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 batches 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 5792B, 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 Each container shall be permanently and legibly marked with not less than the following information:

POWDER, PLASMA SPRAY
AMS 5792B
MANUFACTURER'S IDENTIFICATION _____
LOT NUMBER _____
QUANTITY _____

5.1.2 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 5792B
MANUFACTURER'S IDENTIFICATION _____
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.

5.2.1.1 A lot of powder may be packaged in small quantities and delivered separately under the basic lot approval provided lot identification is maintained.

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.