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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 7238B

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Superseding	AMS 7238A

Alloy PM Shapes, Corrosion, Wear, and Heat Resistant
66Co - 30Cr - 8.25W (1.10 - 1.90C)

(Composition similar to UNS R30012)

CANCELLATION NOTICE

This specification has been "CANCELLED" by the Aerospace Materials Division, SAE, as of May 2001. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications.

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1. SCOPE:

1.1 Form:

This specification covers a corrosion, wear, and heat resistant cobalt alloy in the form of powder-metallurgy shapes.

1.2 Application:

Primarily for parts, such as nozzles, rubbing seals, rollers, guides, and supports, requiring wear, corrosion, and oxidation resistance for use up to 1600°F (870°C).

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specification (AMS) and Aerospace Standards (AS) 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 2269	Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys
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 B328	Density and Interconnected Porosity of Sintered Powder Metal Structural Parts and Oil-Impregnated Bearings
ASTM E3	Preparation of Metallographic Specimens
ASTM E18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 354	Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

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: Shapes shall be produced by consolidation of powder and sintering to produce shapes meeting the requirements of 3.2, 3.4, and 3.5.

3.2 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354 or by spectrographic or other analytical methods approved by purchaser.

	min		max
Carbon	1.10	-	1.90
Manganese	- -		1.00
Silicon	- -		1.50
Chromium	28.00	-	32.00
Tungsten	7.25	-	9.25
Nickel	- -		3.00
Boron	- -		1.00
Iron	- -		3.00
Cobalt	remainder		

3.2.1 Check Analysis: Composition variations shall meet the requirements of AMS 2269.

3.3 Condition: As pressed and sintered or as extruded and sintered.

3.4 Properties: Shapes shall conform to the following requirements:

3.4.1 Hardness: Shall be not lower than 42 HRC or equivalent, determined in accordance with ASTM E18.

3.4.2 Density: Shall be not lower than 0.29 lb per cu in. (8.09 gm/cm^3), determined in accordance with ASTM B328 or by other method agreed upon by purchaser and vendor.

3.4.3 Metallographic Examination: Shapes examined metallographically in accordance with ASTM E3 shall show no evidence of original powder particle shape. Specimens shall be examined at the center of the thickest section. Porosity, if present, shall be distributed uniformly. Shapes shall be free from cracks and evidence of contamination. Surface shall be free of oxidation resulting from sintering.

3.4.4 Porosity: Porosity, if detected, shall be uniformly distributed with pores no larger than 0.010 in. (0.25 mm).

3.5 Quality: Shapes, as received by purchaser, shall be uniform in quality and condition, clean, sound, and free from foreign materials and from imperfections detrimental to usage of the shapes.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of shapes shall supply all samples for vendor's tests 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 shapes conform to the requirements of this specification.

4.2 Classification of Tests:

Tests to determine conformance to all technical 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 shapes 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 required.

4.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction shapes 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 the following:

4.3.1 Two shapes each for hardness and density of each lot.

4.3.2 One shape for metallographic examination from each lot.

4.4 Approval:

4.4.1 Sample shapes from new or reworked tooling and the processing procedure shall be approved by purchaser before shapes for production use are supplied, unless such approval be waived by purchaser. Results of tests on production shapes shall be essentially equivalent to those on the approved sample shapes.

4.4.2 Vendor shall establish for production of sample shapes of each part number parameters for the process control factors which will produce acceptable shapes; these shall constitute the approved processing procedure and shall be used for producing production shapes. If necessary to make any changes in parameters for the process control factors, vendor shall submit for reapproval a statement of the proposed changes in processing and, when requested, sample shapes. Production shapes incorporating the revised operations shall not be shipped prior to receipt of reapproval.