



# AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.  
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

## AMS 5373B

Superseding AMS 5373A

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ALLOY CASTINGS, SAND, CORROSION AND HEAT RESISTANT  
60Co - 29Cr - 4.5W

### 1. SCOPE:

1.1 Form: This specification covers a corrosion and heat resistant cobalt alloy in the form of sand castings.

1.2 Application: Primarily for parts such as nozzles, rubbing seals, rollers, guides, and supports requiring wear and/or erosion resistance in combination with corrosion and heat 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 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., 400 Commonwealth Drive, Warrendale, PA 15096.

#### 2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods  
AMS 2635 - Radiographic Inspection  
AMS 2645 - Fluorescent Penetrant Inspection  
AMS 2694 - Repair Welding of Aerospace Castings  
AMS 2804 - Identification, Castings

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials  
ASTM E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys  
ASTM E446 - Reference Radiographs for Steel Castings Up to 2 in. (51 mm) in Thickness

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

#### 2.3.1 Federal Standards:

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

#### 2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

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### 3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight; determined by wet chemical methods in accordance with ASTM E354, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Carbon	0.90	1.4
Manganese	--	1.00
Silicon	--	1.50
Phosphorus	--	0.04
Sulfur	--	0.03
Chromium	27.0	31.0
Tungsten	3.5	5.5
Nickel	--	3.0
Molybdenum	--	1.5
Iron	--	3.0
Cobalt	remainder	

3.2 Condition: As cast.

3.3 Casting: A melt shall be the metal poured from a single furnace charge of 15,000 lb (6800 kg) or less. A lot shall be all castings of the same part number from one melt presented for vendor's inspection at one time.

3.4 Test Specimens: Chemical analysis specimens shall be of any convenient size, shape, and form for vendor's tests. When chemical analysis specimens are required by purchaser, specimens shall be cast to a size, shape, and form as agreed upon by purchaser and vendor.

3.5 Properties: Castings shall conform to the following requirements:

3.5.1 Hardness: Shall be not lower than 40 HRC or equivalent, determined in accordance with ASTM E18.

3.6 Quality:

3.6.1 Castings, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to usage of the castings.

3.6.1.1 Castings shall have smooth surfaces and shall be well cleaned. Metallic shot or grit shall not be used for final cleaning, unless otherwise permitted.

3.6.2 Castings shall be produced under radiographic control, unless otherwise specified. This control shall consist of radiographic examination of castings in accordance with AMS 2635 until proper foundry technique, which will produce castings free from harmful internal imperfections, is established for each part number and of production castings as necessary to ensure maintenance of satisfactory quality.

3.6.3 When specified, castings shall be subjected to fluorescent penetrant inspection in accordance with AMS 2645.

3.6.4 Radiographic, fluorescent penetrant, and other quality standards shall be as agreed upon by purchaser and vendor. ASTM E446 may be used to define radiographic acceptance standards.

3.6.5 Castings shall not be repaired by peening, plugging, welding, or other methods without written permission from purchaser.

3.6.5.1 When permitted in writing by purchaser, defects in castings may be removed and the castings repaired by welding in accordance with AMS 2694.

#### 4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of castings 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 4.4. Purchaser reserves the right to sample and to perform such confirmatory testing as he deems necessary to ensure that the castings 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 shall be performed on each melt or lot as applicable.

4.3 Sampling: Shall be in accordance with the following:

4.3.1 Two chemical analysis specimens in accordance with 3.4 and/or a casting from each melt.

4.3.2 Two or more castings from each lot.

#### 4.4 Reports:

4.4.1 The vendor of castings shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each melt and for hardness of each lot. This report shall include the purchase order number, melt number, AMS 5373B, part number, and quantity from each melt.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, AMS 5373B, contractor or other direct supplier of castings, part number, and quantity. When castings for making parts are produced or purchased by the parts vendor, that vendor shall inspect each melt of castings to determine conformance to the requirements of this specification, and shall include in the report a statement that the castings conform, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the castings 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 castings represented and no additional testing shall be permitted. Results of all tests shall be reported.

#### 5. PREPARATION FOR DELIVERY:

5.1 Identification: Castings shall be identified in accordance with AMS 2804.

#### 5.2 Packaging:

5.2.1 Castings 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 castings to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.