AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 5398A

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STEEL CASTINGS, SAND AND CENTRIFUGAL, CORROSION RESISTANT 16Cr - 4Ni - 2.9Cu

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

2. APPLICATION: Primarily for parts such as aircraft accessory components requiring corrosion resistance and strength up to 600 F.

3. COMPOSITION:

Carbon	0.06 max
Manganese	0.70 max
Silicon	0.50 - 1.0
Phosphorus	0.04 max
ø Sulfur	0.03 max
Chromium	15.5 - 16.7
Nickel	3.6 - 4.6
Columbium + Tantalum	0.10 - 0.35
Copper	2.5 - 3.2
Nitrogen	0.05 max

4. CONDITION: Solution heat treated. Castings may be given a homogenization heat ø treatment prior to solution heat treatment when permitted by purchaser, and shall be so treated when specified by the purchaser.

5. TECHNICAL REQUIREMENTS:

5.1 Casting: A melt shall be the metal poured from a single furnace charge of ø 15,000 lb or less.

5.2 Test Specimens:

5.2.1 Tensile Test Coupons: Shall be attached to castings, if practicable, or shall be standard keel blocks as shown in Figure 1, unless purchaser permits use of cast to size specimens. Test bars may also be cut from castings. Coupons ø shall be cast with each melt of metal for castings and, when requested, shall be supplied with the castings. Keel blocks shall be cast in molds made of suitable core sand, and shall be left in the mold until black. Metal for the coupons shall be part of the melt which is used for the castings.

5.2.2 Chemical Analysis Specimens: When required by purchaser, shall be of size and shape agreed upon by purchaser and vendor.

5.3 Heat Treatment: All castings and tensile test specimens representing them shall be heat treated as follows:

5.3.1 Homogenization Heat Treatment: When this treatment is specified or permitted, Ø tensile test specimens from each melt, together with production castings shall be heated to 2100 F ± 25, held at heat for 90 min., and cooled as required to below 90 F.

5.3.2 Solution Heat Treatment: Tensile test specimens from each melt, together with Ø production castings, shall be heated to 1925 F ± 25, unless otherwise specified, held at heat for 1 hr per inch of section but in no case less than 30 min., and cooled as required to below 90 F.

Ø5.4 Hardness: Shall be not higher than Brinell 363 or equivalent.

5.5 Properties After Precipitation Heat Treatment:

5.5.1 Tensile test specimens produced in accordance with 5.2 and heat treated as in 5.3 shall conform to the following requirements after being heated to 925 F ± 10, Ø held at heat for 90 min., and cooled in air. If supplied tensile test specimens fail to meet requirements, or are not available, suitable specimens may be prepared from castings for test.

5.5.1.1 Tensile Properties:

Ø	Tensile Strength, psi	180,000 min
	Yield Strength at 0.2% Offset or at 0.0143 in. in 2 in. Extension Under Load (E = 29,000,000), psi	150,000 min
	Elongation, % in 4D	6 min
	Reduction of Area, %	12 min

Ø5.5.1.2 Hardness: Shall be not lower than Brinell 375 or equivalent.

5.5.2 Properties after precipitation heat treatment at temperatures other than 925 ± 10 Ø shall be as agreed upon by purchaser and vendor.

6. QUALITY:

6.1 Castings shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts. Castings shall have smooth surfaces and shall be well cleaned. Unless otherwise specified, metallic shot or grit shall not be used for final cleaning.

6.2 When castings are broken for fracture test, the fracture shall have uniform color and be substantially free from oxides and other imperfections.

6.3 Radiographic and other quality standards shall be as agreed upon by purchaser and vendor.

6.4 Unless otherwise specified, castings shall be produced under radiographic control. This shall consist of radiographic examination of castings 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.

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

7. REPORTS:

7.1 Unless otherwise specified, the vendor of castings shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each melt and a statement that the castings conform to the technical requirements of this specification. This report shall include the purchase order number, melt number, material specification number, precipitation heat treatment temperature if other than 925 F ± 10, part number, and quantity from each melt.

7.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, 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 castings from each melt represented 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.

8. IDENTIFICATION: Castings shall be identified in accordance with the latest issue of AMS 2804. Marking materials shall have no deleterious effects on the castings or their performance.

9. APPROVAL:

9.1 To assure uniformity of quality, sample castings from new or reworked patterns shall be approved by purchaser, unless such approval be waived.

9.2 Vendor shall use the same foundry practices and the same heat treating procedures for production castings as for approved sample castings. If necessary to make any change in processing which could unfavorably affect any characteristics of the castings, vendor shall notify purchaser prior to the first shipment of castings incorporating such change.

10. REJECTIONS: Castings not conforming to this specification or to authorized modifications will be subject to rejection.