



AEROSPACE MATERIAL SPECIFICATION

AMS5342™**REV. G**

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Revised 2026-01

Superseding AMS5342F

(R) Steel, Corrosion-Resistant, Investment Castings,
16Cr - 4.1Ni - 0.28Cb (Nb) - 3.2Cu (17-4),
Homogenization, Solution, and Precipitation Heat Treated (H1100),
130 ksi (896 MPa) Tensile Strength
(Composition similar to UNS J91280 and UNS J92200)

RATIONALE

AMS5342G is the result of a Five-Year Review and update of the specification. The revision clarifies that CEO approval is required for deviations (throughout), updates the applicable heat-treatment specification (see 3.5), adds strain rate control during tensile tests (see 3.6.2), adds welding to control factors (see 4.4.2.2), clarifies Table 4 (see 4.3.5.1), updates reporting requirements including removal of exception (see 4.5), adds trade name information (see 8.5), and adds dimensional inspection to ordering information (see 8.6).

1. SCOPE

1.1 Form

This specification covers a corrosion-resistant steel in the form of investment castings homogenized and solution and precipitation heat treated to 130 ksi (895 MPa) tensile strength.

1.2 Application

These castings have been used typically for parts requiring good corrosion resistance and strength up to 600 °F (316 °C), but usage is not limited to such applications (see 8.2).

1.2.1 Certain processing procedures and service conditions may cause these castings to become subject to stress-corrosion cracking; ARP1110 recommends practices to minimize such conditions.

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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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

AMS2175	Castings, Classification and Inspection of
AMS2248	Chemical Check Analysis Limits, Corrosion- and Heat-Resistant Steels and Alloys, Maraging and Other Highly Alloyed Steels, and Iron Alloys
AMS2360	Room Temperature Tensile Properties of Castings
AMS2694	In-Process Welding of Castings
AMS2700	Passivation of Corrosion Resistant Steels
AMS2761	Heat Treatment of Steel Raw Materials
AMS2804	Identification, Castings
ARP1110	Minimizing Stress Corrosion Cracking in Wrought Forms of Steels and Corrosion Resistant Steels and Alloys
AS7766	Terms Used in Aerospace Metals Specifications
HS-1086	Metals and Alloys in the Unified Numbering System

2.2 ASTM Publications

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

ASTM A751	Chemical Analysis of Steel Products
ASTM E8/E8M	Tension Testing of Metallic Materials
ASTM E18	Rockwell Hardness of Metallic Materials
ASTM E1417/E1417M	Liquid Penetrant Testing
ASTM E1444/E1444M	Magnetic Particle Testing
ASTM E1742/E1742M	Radiographic Examination

2.3 Definitions

Terms used in AMS are defined in AS7766 and as follows:

INTEGRALLY CAST SPECIMEN: An attached specimen that is cast in the mold and remains with the casting lot through the completion of all heat-treatment operation(s) required of the producer. The casting drawing may identify a specific location for the attachment of each integrally cast specimen.

LOT: For room temperature tensile and hardness testing, a lot shall consist of all castings of the same part number, poured from consecutive melts of a single master heat, and processed through solution and precipitation heat-treat operations in the same furnace loads. For visual and nondestructive testing, a lot shall consist of castings of the same part number, manufactured under the same process control parameters of 4.4.2.2, and submitted for those tests in a single group.

MASTER HEAT: Refined metal of a single furnace charge that may be poured directly into castings and/or converted into ingot for remelting in accordance with 3.2. One or more melts can be poured from a single master heat. Qualification of a master heat is described in 3.4.2.

MELT: All castings poured from a single furnace charge. Also referred to as remelt, sub-melt, heat, or sub-heat.

REFINED METAL: Metal derived from raw materials in the form of virgin elements, master alloy, and/or revert melted in any combination, replenished as needed, fluxed for nonmetallics, and then degassed as necessary.

REPLENISHMENT: Virgin element and/or master alloy additions introduced to the furnace during the final stage of melting, as necessary, to bring the melt or master heat into conformance with the specified composition.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to the cognizant engineering organization (CEO).

Table 1 - Composition

Element	Min	Max
Carbon	--	0.06
Manganese	--	0.70
Silicon	0.50	1.00
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	15.50	16.70
Nickel	3.60	4.60
Columbium (Niobium)	0.15	0.40
Copper	2.80	3.50
Aluminum	--	0.05
Tin	--	0.02
Nitrogen	--	0.05

3.1.1 The producer may test for any element not otherwise listed in Table 1 and include this analysis in the report of 4.5. Limits of acceptability may be specified by the CEO.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Melting Practice

Castings and specimens shall be poured at the casting producer's facility either from a melt of a master heat or directly from a master heat (see 2.3 and 3.4.2).

3.2.1 Revert (gates, sprues, risers, and rejected castings) may be used only in the preparation of master heats; revert shall not be remelted directly, without refining, for pouring of castings. Melting of revert creates a new master heat.

3.2.2 Portions of two or more qualified master heats (see 3.4.2) may be melted together and poured into castings using a procedure authorized by the CEO.

3.2.3 If melts are modified by replenishment (see 2.3), the producer shall have a written procedure acceptable to the CEO that defines the controls, tests, and traceability criteria for both castings and separately cast specimens. Control factors of 4.4.2.2 shall apply.

3.3 Condition

Castings shall be delivered in the homogenized, solution-treated, and precipitation heat-treated condition, except as specified in 3.3.1 or 3.3.2.

3.3.1 When specified by the CEO, castings shall be solution and precipitation heat treated, omitting homogenization heat treatment.

3.3.2 When specified by the CEO, castings shall be solution heat treated twice and precipitation heat treated, omitting homogenization heat treatment.

3.4 Test Specimens

Specimens shall be either separately cast, integrally cast (see 2.3), or machined-from-casting and shall conform to 3.2.

3.4.1 If specimens are separately cast, the producer shall have a written procedure acceptable to the CEO. Control factors of 4.4.2.2 shall apply.

3.4.2 Each master heat shall be qualified by evaluation of chemical specimens.

3.4.2.1 If replenishments are made at remelt as in 3.2.3, the frequency of sampling and testing used by the producer for qualification to 3.4.2 shall be acceptable to the CEO.

3.4.3 Chemical Analysis Specimens

Chemical analysis specimens shall be of any convenient size and shape.

3.4.4 Tensile Specimens

Tensile specimens shall be of standard proportions in accordance with ASTM E8/E8M with 0.250-inch (6.35-mm) diameter at the reduced parallel gauge section.

3.4.4.1 Separately cast and integrally cast specimens may be either cast to size or cast oversize and subsequently machined to 0.250-inch (6.35-mm) diameter.

3.4.4.2 When integrally cast specimens and specimens machined-from-casting are specified, specimen size and/or location shall be agreed upon by the CEO and producer (see 8.6).

3.5 Heat Treatment

Castings and representative tensile specimens shall be heat treated in accordance with AMS2761 except as specified in 3.5.1.

3.5.1 Castings and Tensile Specimens

3.5.1.1 Homogenization Heat Treatment

Heat to 2100 °F ± 25 °F (1149 °C ± 14 °C), hold at heat for not less than 90 minutes, and cool as required to room temperature.

3.5.1.2 Solution Heat Treatment

Heat to 1900 °F ± 25 °F (1038 °C ± 14 °C), hold at heat for 1 hour per inch (25 mm) of section thickness but not less than 30 minutes, and cool as required to below 70 °F (21 °C).