



AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS-T-81915A

Titanium and Titanium-Alloy Castings, Investment

RATIONALE

AMS-T-81915B is stabilized as there are not any users of the document.

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AMS4992 is a similar, but not identical specification.

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Under Department of Defense policies and procedures, any qualifications requirements and associated qualified products lists are mandatory to DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this technical report.

1. SCOPE:

1.1 Scope:

This specification prescribes the requirements for Titanium and Titanium-alloy castings produced by the investment casting process.

1.2 Classification:

The titanium and titanium-alloy castings furnished under this specification shall be of the following types, compositions and grades (see 6.2).

1.2.1 Types and composition:

Type I	Commercially pure titanium Composition A (see 3.2)
Type II	Alpha-titanium alloy Composition A - Ti-5Al-2.5Sn
Type III	Alpha-beta titanium alloy Composition A - Ti-6Al-4V Composition B - Ti-6Al-2Sn-4Zr-2Mo

1.2.2 Grades: Castings shall be of Grades A, B and C as shown in Tables II and III, and shall be in accordance with the radiographic reference specified in the tables.

2. APPLICABLE DOCUMENTS:

The following publications of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

2.1 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-81200	Heat Treatment of Titanium and Titanium Alloys
FED-STD-151	Metals; Test Methods
FED-STD-184	Identification Marking of Aluminum, Magnesium and Titanium
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-453	Inspection, Radiographic
MIL-STD-2175	Casting, Classification and Inspection of
MIL-STD-6866	Inspection, Liquid Penetrant

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 660	Packaging/Packing of Aluminum and Magnesium Products, Standard Practice for
ASTM E 8	Tension Testing of Metallic Materials
ASTM E 155	Reference Radiographs for Inspection of Aluminum and Magnesium Castings (Series II)

3. REQUIREMENTS:

3.1 Melting Processes:

The material shall be produced by multiple melting under vacuum or inert atmosphere. Melting processes shall include either singly or in combination, electro-consumable arc, electron beam or other vacuum melting processes suitable for the production of materials meeting the requirements of this specification.

3.2 First Article:

Unless otherwise specified in the contract or order, two castings shall be submitted in advance of production as directed by the procuring activity for examination and written approval. One casting shall be identified as the "dimensional sample," and shall be for dimensional approval. The other casting shall be identified as the "foundry control sample," and shall be for radiography and destructive tests as necessary for approval (see 6.2).

3.2.1 The submitted castings shall be fully representative of the foundry practice that will be used in production. If temporary gating was used to develop suitable foundry practice, the submitted casting shall be made after the permanent gating has been installed. All critical melting and pouring parameters shall be recorded.

3.2.2 Molds: The mold materials should be essentially nonreactive, as shall the atmospheres in the molds at the time of pouring.

3.2.3 Surface contamination: The surfaces of castings shall be free from surface contamination by oxygen, nitrogen or carbon. Pickling or chemical milling may be used to remove contaminated zones from as-cast surfaces. The surface roughness shall not exceed RHR 80 when the casting is submitted to the purchaser.

3.3 Material:

The material shall be such as to produce investment castings in full compliance with the requirements specified herein.

3.4 Chemical composition:

The chemical analysis of castings shall comply with the limits specified in Table I.