



AEROSPACE MATERIAL SPECIFICATION

AMS-QQ-A-591

REV. B

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Superseding AMS-QQ-A-591A

Aluminum Alloy Die Castings

RATIONALE

AMS-QQ-A-591B stabilizes this document because it no longer state of the art and other documents contain similar but not necessarily equivalent requirements.

STABILIZED NOTICE

AMS-QQ-A-591B has been declared "STABILIZED" by AMS Committee D. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because it is no longer state of the art and other documents contain similar but not necessarily equivalent requirements. Previously this document was Noncurrent. This document has never been technically updated. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification; including exceptions listed on the certification. NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

AMS Committee D recommends that the following similar but not identical specifications may be considered for future procurement. This listing does not constitute authority to substitute these specifications for the "STABILIZED" specification.

AMS4290 Aluminum Alloy, Die Castings 9.5Si - 0.50Mg (360.0-F), As Cast

AMS4291 Aluminum Alloy, Die Castings, 8.5Si - 3.5Cu (A380.0-F), As Cast

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NOTICE

This document has been taken directly from U.S. Military Specification QQ-A-591F and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace QQ-A-591F. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

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

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers aluminum alloy die castings.

1.2 Classification:

1.2.1 Alloys: Aluminum die castings shall be furnished in the alloys shown in table I, as specified (see 6.2).

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.

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

2.2 ASTM Publications:

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

ASTM B 85 Casting, Die Aluminum Alloy

ASTM B 557 Aluminum and Magnesium Alloy Products, Tension Testing Wrought and Cast

2.3 National Motor Freight Traffic Association, Inc., Agent:

Available from American Trucking Associations, Inc., Traffic Department, 1616 P Street, N.W., Washington, DC 20036.

National Motor Freight Classification

2.4 Uniform Classification Committee, Agent:

Available from Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.

Uniform Freight Classification

3. REQUIREMENTS:

3.1 Manufacture:

The die castings shall be made by forcing molten material under pressure into a mold or die. Unless otherwise specified or shown on the applicable drawing (see 6.2), die castings shall be made by the cold-chamber process.

3.2 Chemical composition:

3.2.1 The chemical composition of the material shall be within the limits shown in table I.

3.2.2 The supplier shall furnish an analysis of each lot showing the percentage of each of the elements specified in table I. Chemical analysis of the individual lots by the contractor may be waived at the discretion of the Government inspector, provided that the foundry's method of composition control is acceptable to him, or that all the material in the lot can be identified as being from melts previously analyzed and found to be in conformance with the chemical composition requirements of the alloy specified herein.

3.3 Soundness:

3.3.1 When specified (see 6.2), the soundness of die castings shall conform to standards furnished or approved by the purchaser. The number and extent of blowholes, sponginess, and other defects in the die castings shall not exceed those shown by the standards, and such defects shall be substantially absent in designated areas.

3.3.1.1 The standards supplied or approved by the purchaser for determining conformance with soundness requirements shall consist of either sectionalized die castings, photographs thereof, or radiographs of at least the important sections of die castings.

3.3.2 When specified (see 6.2), the weight of each casting shall be not less than a specified minimum when weighed in accordance with 4.5.3.3.

3.4 Foundry control:

Unless otherwise specified (see 6.2), die castings shall be produced under foundry control approved by the purchaser. Foundry control shall consist of examination of die castings by radiographic or other approved methods for determining internal defects until the gating and other foundry practices have been established to produce die castings meeting the quality standards furnished by the purchaser or agreed upon by the purchaser and supplier. When foundry practices have been so established, the production method shall not be changed without demonstrating to the satisfaction of the purchaser that the change does not adversely affect the quality of the die castings.