

AEROSPACE MATERIAL SPECIFICATION

Issued JUN 1998
Cancelled AUG 2006

Superseding AMS-QQ-A-250/20

Aluminum Alloy 5456, Plate and Sheet, for Sea Water Applications

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of August, 2006, and has been superseded by the specifications listed below. The requirements of the latest issue of the specifications listed below shall be fulfilled whenever reference is made to the cancelled AMS-QQ-A-250/20. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications, noting that it has been superseded by the specifications listed below.

Temper	Superseding Material and Specification
O	5456-O in accordance with ASTM B 209/B 209M, Aluminum and Aluminum-Alloy Sheet and Plate
H112	5456-H112 in accordance with ASTM B 209/B 209M, Aluminum and Aluminum-Alloy Sheet and Plate
H116	5456-H116 in accordance with ASTM B 928/B 928M, High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environments
H323	Cancelled without replacement
H343	Cancelled without replacement
H117	Cancelled without replacement

Cancelled specifications are available from SAE.

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NOTICE

This document has been taken directly from Federal Specification QQ-A-250/20 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-250/20. Any part numbers established by the original specification remain unchanged.

The original Federal 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 material relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this technical report.

The complete requirements for procuring 5456 aluminum plate and sheet described herein shall consist of this document and the latest issue of AMS QQ-A-250.

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for aluminum alloy 5456 plate and sheet for applications requiring a weldable moderate strength alloy having comparatively good corrosion resistance.

1.2 Classification:

1.2.1 Tempers: The plate and sheet are of the following tempers, as specified (see 6.2). Definitions of these tempers are specified in AMS QQ-A-250.

O - Annealed.

H112 - As rolled, properties as specified in table II.

H116 - Specially treated properties as specified in table II.

H117 - Specially treated properties as specified in table II.

H323 - Strain-hardened one-quarter hard (cold rolled) temper and then stabilized.

H343 - Strain-hardened half-hard (cold rolled) temper and then stabilized.

2. APPLICABLE DOCUMENTS:

See AMS QQ-A-250 and the following:

2.1 ASTM Publications:

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

ASTM B 117 Method of Salt Spray (Fog) Testing

ASTM D 1141 Standard Specification for Substitute Ocean Water

3. REQUIREMENTS:

3.1 First article sample:

Prior to beginning production a sample shall be tested as specified in 4.1.2 through 4.2.1 (see 6.3).

3.2 Chemical composition:

3.2.1 The chemical composition shall conform to the requirements specified in table I.

3.3 Mechanical properties:

3.3.1 Mechanical properties of material, as supplied: The mechanical properties parallel to the direction of final rolling, shall conform to the requirements of table II for the temper specified.

Table I. Chemical composition¹

Element	Percent	
	Minimum	Maximum
Magnesium	4.7	5.5
Chromium	0.05	0.20
Manganese	0.50	1.0
Titanium	----	0.20
Copper	----	0.10
Zinc	----	0.25
Iron plus silicon	----	0.40
Others, each	----	0.05
Others, total	----	0.15
Aluminum	Remainder	

¹ Analysis shall regularly be made only for the elements specifically mentioned in the table. If, however, the presence of other elements is indicated in the course of routine analysis, further analysis shall be made to determine conformance to the limits specified for other elements.

3.4 Acceptance control criteria for exfoliation and intergranular corrosion (production lots):

Each production lot of material shall meet all of the requirements specified herein. Tests for susceptibility to exfoliation and intergranular corrosion, as established by metallographic examination in 4.3, shall reveal that:

- a. The microstructure is predominately free of a continuous grain boundary network of aluminum-magnesium precipitate; and
- b. The microstructure is equivalent to or better than the reference preproduction microstructures established in 4.2.

3.4.1 Excess aluminum magnesium precipitate: If the microstructure conforms to (a) but shows evidence of aluminum-magnesium precipitate in excess of that established by the reference micrograph under first article approval, the lot shall be considered suspect and must be subjected to the corrosion test specified in 4.4 for base metal specimens. These specimens shall show no visual evidence of corrosion after testing.

Table II. Mechanical properties

Temper	Thickness	Tensile Strength		Yield strength ^{1/}		Elongation in 2 in. or 4 times D, ^{2/} , ^{3/} , minimum
		Minimum	Maximum	Minimum	Maximum	
	<u>Inches</u>	<u>p.s.i.</u>	<u>p.s.i.</u>	<u>p.s.i.</u>	<u>p.s.i.</u>	<u>Percent</u>
0	0.051 thru 1.500	42,000	53,000	19,000	-----	16
	1.501 thru 3.000	41,000	52,000	18,000	-----	16
	3.001 thru 5.000	40,000	-----	17,000	-----	14
	5.001 thru 7.000	39,000	-----	16,000	-----	14
	7.001 thru 8.000	38,000	-----	15,000	-----	12
H112	0.250 thru 1.500	42,000	-----	19,000	-----	12
	1.501 thru 3.000	41,000	-----	18,000	-----	12
H116 and H117	0.188 thru 0.624	46,000	-----	33,000	-----	10
	0.625 thru 1.250	46,000	-----	33,000	-----	12
	1.251 thru 1.500	44,000	-----	31,000	-----	12
	1.501 thru 3.000	41,000	-----	29,000	-----	12
H323	0.051 thru 0.125	48,000	58,000	36,000	46,000	6
	0.126 thru 0.249	48,000	58,000	36,000	46,000	8
H343	0.051 thru 0.125	53,000	63,000	41,000	51,000	6
	0.126 thru 0.249	53,000	63,000	41,000	51,000	8

^{1/}At 0.2 percent offset.

^{2/}Not required for material 1/2 inch or less in width.

^{3/}D represents specimen diameter.