

AEROSPACE
MATERIAL
SPECIFICATION

AMS 4199

Issued 11-1-70
Revised 4-1-85

ALUMINUM ALLOY SHEET AND PLATE, ALCLAD

4.3Zn - 3.3Mg - 0.6Cu - 0.20Mn - 0.17Cr (7011 Alclad 7079; -T6 Sheet, -T651 Plate)

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 4-6-84. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the original issue of the subject specification.

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AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

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1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Primarily for structural use, including machined parts subject to excessive warpage during machining, where fatigue strength and tensile properties higher than those provided by Alclad 7079-T6 and -T651 are required. Certain design and processing procedures may cause this material to be susceptible to stress corrosion cracking; ARP 823 recommends practices to minimize such conditions.

3. **COMPOSITION:**

Core (7079)		Cladding (7011)	
	min max		min max
Zinc	3.8 - 4.8	Zinc	4.0 - 5.5
Magnesium	2.9 - 3.7	Magnesium	1.0 - 1.6
Copper	0.40 - 0.8	Manganese	0.10 - 0.30
Manganese	0.10 - 0.30	Chromium	0.05 - 0.20
Chromium	0.10 - 0.25	Iron	-- 0.20
Iron	-- 0.40	Silicon	-- 0.15
Silicon	-- 0.30	Copper	-- 0.05
Titanium	-- 0.10	Titanium	-- 0.05
Other Impurities, each	-- 0.05	Other Impurities, each	-- 0.05
Other Impurities, total	-- 0.15	Other Impurities, total	-- 0.15
Aluminum	remainder	Aluminum	remainder

4. **CONDITION:**

- 4.1 **Sheet:** Solution and precipitation heat treated.
- 4.2 **Plate:** Solution heat treated, stress relieved by stretching, and precipitation heat treated.
 - 4.2.1 Plate shall be stretched in the solution heat treated condition to produce a nominal permanent set of 2% but not less than 1-1/2% nor more than 3%.
 - 4.2.2 Plate shall receive no further straightening operations after stretching.
5. **TECHNICAL REQUIREMENTS:** The product shall conform to the following requirements; tensile properties shall be determined in accordance with the latest issue of AMS 2355.
 - 5.1 **Cladding Thickness:** After rolling, the average cladding thickness shall be as shown. Routine measurements are not required.

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