AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 4014

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Revised

# ALUMINUM ALLOY PLATE
## 4.5Cu - 0.8Si - 0.80Mn - 0.5Mg (2014-T651)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts requiring high strength and for structural machined parts subject to warpage during machining due to residual stresses. 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:

| | min | max |
|---|---|---|
| Copper | 3.9 | 5.0 |
| Silicon | 0.50 | 1.2 |
| Manganese | 0.40 | 1.2 |
| Magnesium | 0.20 | 0.8 |
| Iron | -- | 1.0 |
| Zinc | -- | 0.25 |
| Titanium | -- | 0.15 |
| Chromium | -- | 0.10 |
| Other Impurities, each | -- | 0.05 |
| Other Impurities, total | -- | 0.15 |
| Aluminum | remainder | |

4. CONDITION: Solution heat treated, stretched to produce a nominal permanent set of 2%, but not less than 1-1/2% or more than 3%, and precipitation heat treated.

4.1 Material shall receive no further straightening operations after stretching.

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Tensile Properties: Test specimens shall conform to ASTM E8 and shall be taken across the direction of rolling from widths 9 in. and over and parallel to the direction of rolling from widths less than 9 inches. Sheet type specimens shall be used for material less than 0.5 in. thick and 0.75 in. and over in width. Round specimens shall be used for material 0.5 in. and over in thickness and 0.75 in. and over in width. Material under 0.75 in. wide and under 0.5 in. thick may be tested either in full section or by use of round specimens; for such sizes, elongation requirements apply only when round specimens are used.

| Nominal Thickness Inches | Tensile Strength psi, min | Yield Strength at 0.2% Offset or at Extension Indicated (E = 10,500,000) psi, min | Extension Under Load in. in 2 in. | Elongation % in 2 in. or 4D, min |
|---|---|---|---|---|
| 0.250 to 0.499 incl | 67,000 | 59,000 | 0.0152 | 7 |
| Over 0.499 to 1.000 incl | 67,000 | 59,000 | 0.0152 | 6 |
| Over 1.000 to 2.000 incl | 67,000 | 59,000 | 0.0152 | 4 |
| Over 2.000 to 2.500 incl | 65,000 | 58,000 | 0.0151 | 2 |
| Over 2.500 to 3.000 incl | 63,000 | 57,000 | 0.0149 | 2 |
| Over 3.000 to 4.000 incl | 59,000 | 55,000 | 0.0145 | 1 |

5.1.1 When a dispute occurs between purchaser and vendor over the yield strength value, yield strength determined by the offset method shall apply.

5.1.2 Tensile properties of material over 4.000 in. in thickness shall be as agreed upon by purchaser and vendor.

5.2 Bending: Material 0.499 in. and under in thickness shall be capable of withstanding, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to 12 times the nominal thickness of the material with axis of bend parallel to direction of rolling.

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2202.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product conforms to the chemical composition and technical requirements of this specification. This report shall include the purchase order number, material specification number, thickness, size, and quantity.

8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.