Aluminum 319.0-T5, Sand Cast

**Categories:** Metal; Nonferrous Metal; Aluminum Alloy; Aluminum Casting Alloy

**Material Notes:** Data points with the AA note have been provided by the Aluminum Association, Inc. and are NOT FOR DESIGN.

**Composition Notes:** Composition information provided by the Aluminum Association and is not for design.

**Key Words:** Aluminum 319.0-T5; UNS A03190; AA319.0-T5, ISO 3522: AlSi5Cu3Mn; AlSi6Cu4Mn. ISO R164: AlSi5Cu3; AlSi5Cu3Fe; AlSi6Cu4; ISO 3522: AlSi5Cu3

**Vendors:** No vendors are listed for this material. Please click here if you are a supplier and would like information on how to add your listing to this material.

### Physical Properties

**Density**
- Metric: 2.79 g/cc
- English: 0.101 lb/in³

### Mechanical Properties

**Hardness, Brinell**
- Metric: 65.0 - 95.0
- English: 65.0 - 95.0
- Comments: AA; Typical; 500 g load; 10 mm ball

**Hardness, Knoop**
- Metric: 103
- English: 103
- Comments: Estimated from Brinell Hardness.

**Hardness, Rockwell B**
- Metric: 49
- English: 49
- Comments: Estimated from Brinell Hardness.

**Hardness, Vickers**
- Metric: 90
- English: 90
- Comments: Estimated from Brinell Hardness.

**Tensile Strength, Ultimate**
- Metric: >= 172 MPa
- English: >= 25000 psi
- Comments: In Tension; elastic modulus in compression is typically about 2% higher for aluminum alloys.

**Poissons Ratio**
- Metric: 0.330
- English: 0.330

**Machinability**
- Metric: 50 %
- English: 50 %

**Shear Modulus**
- Metric: 28.0 GPa
- English: 4060 ksi

**Shear Strength**
- Metric: 107 MPa
- English: 15500 psi
- Comments: Calculated

### Electrical Properties

**Electrical Resistivity**
- Metric: 0.00000640 ohm-cm
- English: 0.00000640 ohm-cm

### Thermal Properties

**Heat of Fusion**
- Metric: 389 J/g
- English: 167 BTU/lb

**CTE, linear[1]**
- Metric: 21.4 μm/m·°C
  - @Temperature: 20.0 - 100 °C
  - @Temperature: 68.0 - 212 °F
- English: 11.9 μin/in·°F

**Specific Heat Capacity**
- Metric: 0.963 J/g·°C
- English: 0.230 BTU/lb·°F

**Melting Point**
- Metric: 516 - 604 °C
- English: 961 - 1120 °F

**Solidus**
- Metric: 516 °C
- English: 961 °F

**Liquidus**
- Metric: 604 °C
- English: 1120 °F

### Processing Properties

**Melting Temperature**
- Metric: 677 - 816 °C
- English: 1250 - 1500 °F

**Solution Temperature**
- Metric: 502 - 507 °C
- English: 935 - 945 °F
- Comments: hold at temperature 12 hr, cool in water at 150 to 212°F

** Casting Temperature**
- Metric: 677 - 788 °C
- English: 1250 - 1450 °F

### Component Elements Properties

<table>
<thead>
<tr>
<th>Element</th>
<th>Metric</th>
<th>English</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum, Al</td>
<td>85.8 - 91.5 %</td>
<td>85.8 - 91.5 %</td>
<td>As remainder</td>
</tr>
<tr>
<td>Copper, Cu</td>
<td>3.0 - 4.0 %</td>
<td>3.0 - 4.0 %</td>
<td></td>
</tr>
<tr>
<td>Iron, Fe</td>
<td>&lt;= 1.0 %</td>
<td>&lt;= 1.0 %</td>
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</tr>
<tr>
<td>Magnesium, Mg</td>
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<td>&lt;= 0.10 %</td>
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<tr>
<td>Manganese, Mn</td>
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<td>&lt;= 0.50 %</td>
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<tr>
<td>Nickel, Ni</td>
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<td>&lt;= 0.35 %</td>
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<tr>
<td>Other, total</td>
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<td>&lt;= 0.50 %</td>
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<tr>
<td>Silicon, Si</td>
<td>5.50 - 6.50 %</td>
<td>5.50 - 6.50 %</td>
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<tr>
<td>Titanium, Ti</td>
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<td>&lt;= 0.25 %</td>
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<tr>
<td>Zinc, Zn</td>
<td>&lt;= 1.0 %</td>
<td>&lt;= 1.0 %</td>
<td></td>
</tr>
</tbody>
</table>

**References** for this datasheet.

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's terms of use regarding this information. Click here to view all the property values for this datasheet as they were originally entered into MatWeb.