

# 1000 SERIES ALUMINUM ALLOYS

## Flat, Shaped and Round Wire

### Applications

Components for the food, chemical and brewing industries; Nameplates; Reflectors; Capacitors; Solid and stranded conductor wire; Bus Conductors; Transformer strip

### Description

1000 Series has minimum of 99% aluminum with no major alloying additions. These compositions are characterized by excellent corrosion resistance, high thermal and electrical conductivity, low mechanical properties and excellent workability. These alloys are non-heat treatable. The most common type is A91100 which is commercially pure aluminum. It is soft and very ductile, having excellent workability. Well suited for applications involving severe forming as it work hardens more slowly during forming. It is the most weldable of all aluminum alloys.

### Chemistry Typical

UNS #	ALUMINUM	ADDITIONAL ELEMENTS
A91050	99.50 min	0.25 Si max, 0.40 Fe max, 0.050 Cu max, 0.050 Mn max, 0.05 Mg max, 0.05 V max, 0.03 max other (each)
A91100	99.00 min	1.0 max Si +Fe, 0.05-0.20 Cu, 0.05 Mn max, 0.10 Zn max, 0.05 max other (each), 0.150 max other (total)
A91180	99.80 min	0.010 Cu max, 0.030 Ga max, 0.09 Fe max, 0.020 Mn max, 0.020 Mg max, 0.090 Si max, 0.020 Ti max, 0.050 V max, 0.030 Zn max
A91199	99.99 min	0.006 Cu max, 0.005 Ga max, 0.006 Fe max, 0.006 Mn max, 0.002 Mg max, 0.006 Si max, 0.002 Ti max, 0.005 V max, 0.006 Zn max, 0.002 max other (each)
A91350	99.50	0.050 B max, 0.01 Cr max, 0.05 Cu max, 0.03 Ga max, 0.40 Fe max, 0.01 Mn max, 0.10 Si max, 0.02 min V + Ti, 0.05 Zn max, 0.03 max other (each), 0.10 max other (total)

\* Contact Ulbrich Wire for request regarding the availability of other aluminum alloys.

Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels & Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.

Copyright January 2014 Revision 10.01.2015. Ulbrich Stainless Steels & Special Metals, Inc. All rights reserved.

**We Deliver Precision®**

ULBRICHWIRE.COM

\* The aluminum content for unalloyed aluminum not made by a refining process is the difference between 100.00 percent and the sum of all other analyzed metallic elements present in amounts of 0.010 percent or more each, expressed to the second decimal before determining the sum. For alloys and unalloyed aluminum not made by a refining process, when the specified maximum limit is 0.XX, an observed value or a calculated value greater than 0.005 but less than 0.010% is rounded off and shown as "less than 0.01%". Composition information provided by the Aluminum Association and is not for design.

## Physical Properties

Typical Density: 0.098 lbs/in<sup>3</sup>, 2.7 g/cm<sup>3</sup>

Electrical Conductivity: (% IACS at 68°F, annealed): 59-65%

Thermal Conductivity: BTU-in/hr-ft<sup>2</sup>-°F at 68°F: 1540 - 1690

Mean Coefficient of Thermal Expansion:  $\mu\text{in/in-}^\circ\text{F}$ : 68 - 572 °F: 14.2

Modulus of Elasticity: KSI: 8.9 - 10 x 10<sup>3</sup> in tension

Melting Temperature: 1190 - 1220 °F (646 - 658 °C)

## Forms

Profile, Round, Flat, Square

## Mechanical Properties at Room Temperature

### Properties: Temper O

Ultimate Tensile Strength: 6.5 KSI min (45 MPa min)

Yield Strength: 1.5 KSI min (10 MPa min)

Elongation: 23% min

### Properties: Tempered

These alloys can be cold worked to various tempers.

*\* Actual physical and mechanical properties are alloy dependent. Contact Ulbrich Technical Service for alloy specific properties.*

## Additional Properties

### Corrosion Resistance

Contact Ulbrich Wire for specific information.

### Wire Finishes

XC - Extra clean. Annealed or annealed and cold rolled.

Contact Ulbrich Wire with special finish requests.

### Heat Treatment

These alloys are hardenable by cold working and by heat treatment.

### Welding

Contact Ulbrich Wire for specific information.

Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels & Special Metals, Inc., be liable for any damages arising from the use of the information included in this document or that it is suitable for the 'applications' noted. We believe the information and data provided to be accurate to the best of our knowledge but, all data is considered typical values only. It is intended for reference and general information and not recommended for specification, design or engineering purposes. Ulbrich assumes no implied or express warranty in regard to the creation or accuracy of the data provided in this document.

Copyright January 2014 Revision 10.01.2015. Ulbrich Stainless Steels & Special Metals, Inc. All rights reserved.

**We Deliver Precision®**

ULBRICHWIRE.COM