



# 204Cu Stainless Steel, UNS S20430

Shaped, Flat, Square, Round, Fine Wire, Plated and Un-plated Wire  
ASTM A313

## 204cu Alloy Description

 [Get A Quote](#)

Alloy 204Cu is a chromium-magnesium austenitic stainless steel with an addition of 2-4% copper and nitrogen of 0.05-0.25%. Being slightly magnetic after cold working, Alloy 204Cu offers advantages over other austenitic stainless in certain applications. Even this small amount of magnetism can be minimized using special processing techniques. Alloy 204Cu bridges the cost-property gap between 200 and 300 series stainless.

## Applications

Screen industry in the coal handling equipment to filter coal slurry.

Hinge pins

Baskets used in the tobacco industry

Components where higher strength, non-magnetic behaviour and galling resistance over 304 or 304HQ is required

## Chemistry Typical

Carbon: 0.15 max

Phosphorus: 0.060 max

Silicon: 1.00 max

Nickel: 1.50-3.50

Chromium: 15.50-17.50

Manganese: 6.5-9.0

Copper: 2.00-4.00

Molybdenum: 1.00 max

Sulfur: 0.030 max

Nitrogen: 0.05-0.25

Iron: Balance

## Physical Properties

Density: 0.282lb/in<sup>3</sup>, 7.81 g/cm<sup>3</sup>

Electrical Resistivity: ohm-inch (microhms-m) 30.039 (0.763)

Mean Specific Heat: BTU/lb-°F (J/g-°C):

At 73-212°F (23-100°C): 0.119 (.511)

Thermal Conductivity: BTU-in/hr-ft<sup>2</sup>-°F (W/m•K)

At 122°F (50°C): 93.79 (13.52)

At 212°F (100°C): 104.02 (14.99)

At 392°F (200°C): 118.31 (17.00)

At 572°F (300°C): 131.18 (18.91)

At 752°F (400°C): 142.44 (20.53)

At 932°F (500°C): 154.43 (22.26)

Mean Coefficient of Thermal Expansion: μin/in-°F (μm/m-°C)

77 - 212°F (25 - 100 °C): 9.50 (17.1)

77 - 302°F (25 - 150 °C): 9.61 (17.3)

77 - 392°F (25 - 200 °C): 9.77 (17.6)

77 - 482°F (25 - 250 °C): 9.94 (17.9)

77 - 572°F (25 - 300 °C): 10.05 (18.1)

77 - 662°F (25 - 350 °C): 10.16 (18.3)

77 - 752°F (25 - 400 °C): 10.33 (18.6)

77 - 842°F (25 - 450 °C): 10.44 (18.8)

77 - 932°F (25 - 500 °C): 10.55 (19.0)

77 - 1022°F (25 - 550 °C): 10.66 (19.2)

77 - 1112°F (25 - 600 °C): 10.77 (19.4)

77 - 1202°F (25 - 650 °C): 10.83 (19.5)

77 – 1292°F (25 – 700 °C):10.77 (19.4)

Modulus of Elasticity: KSI (MPa)

$29 \times 10^3$  ( $200 \times 10^3$ ) in tension

Magnetic Permeability, H = 200 Oersteds: Annealed: 1.02 max\*

\* Alloy 204Cu is slightly after cold working but can be minimized. For wire products contact Ulbrich Shaped Wire Technical Services for details

Melting Range: 2552-2642°F (°1400-1450C):

## **Mechanical Properties at Room Temperature**

Properties: Annealed Typical

Ultimate Tensile Strength: 92 KSI (635MPa)

Yield Strength: 42 KSI (290 MPa)

Elongation: 75%

Reduction in Area: 77%

## **Properties: Tempered Typical**

### **5% Cold Worked**

Ultimate Tensile Strength: 97 KSI (669MPa)

Yield Strength: 63 KSI (435MPa)

Elongation: 69%

Reduction in Area: 77%

### **10% Cold Worked**

Ultimate Tensile Strength: 108 KSI (745 MPa)

Yield Strength: 81 KSI (559 MPa)

Elongation: 49%

Reduction in Area: 65%

### **20% Cold Worked**

Ultimate Tensile Strength: 123 KSI(849 MPa)

Yield Strength: 104 KSI (718 MPa)

Elongation: 34%

Reduction in Area: 54%

### **30% Cold Worked**

Ultimate Tensile Strength: 149 KSI (1026MPa)

Yield Strength: 133 KSI (910 MPa)

Elongation: 26%

Reduction in Area: 66%

### **40% Cold Worked**

Ultimate Tensile Strength: 160 KSI (1104 MPa)

Yield Strength: 150KSI (1035 MPa)

Elongation: N/A

Reduction in Area: N/A

### **50% Cold Worked**

Ultimate Tensile Strength: 175 KSI (1208 MPa)

Yield Strength: 170 KSI (1173 MPa)

Elongation: 27%

Reduction in Area: 64%

### **60% Cold Worked**

Ultimate Tensile Strength: 208 KSI (1435MPa)

Yield Strength: 176 KSI (1214 MPa)

Elongation: 18%

Reduction in Area: 62%

### **Properties: Tempered**

Alloy 204Cu can be cold worked to additional tempers. Contact Ulbrich Wire Technical Service for additional information

## **Additional Properties**

### **Corrosion Resistance**

Refer to NACE (National Association of Corrosion Engineers) for recommendations

## Standard Wire Finishes

Extra Clean: Extra clean is also referred to as “bright annealed” or “bright annealed and cold rolled”

Grease (round wire only): Drawn in a heavy grease produces an “Ultra bright” finish for decorative applications

Soap (round wire only): Soap is used as a lubricant in the drawing process and is not removed. It acts as a lubricant during customer part forming operation. A soap finish is available in tempered products.

Plated: Many plating options are available.

- Special finishes are available: Contact Ulbrich Wire Sales with special finish and plating requests

## Forms

Continuous Coils

Cut to lengths

Precision cutting

## Heat Treatment

Alloy 204Cu is non hardenable by heat treatment

## Welding

For best results refer to: SSINA’s “Welding of Stainless Steels and Other Joining Methods”.

*Limitation of Liability and Disclaimer of Warranty: In no event will Ulbrich Stainless Steels and 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.*

