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Ulbrich Stainless Steels & Special Metals, Inc. • 153 Washington Avenue • North Haven, CT 06473 USA • 800-243-1676 • ULBRICH.com

304V STAINLESS STEEL, UNS S30400

ASTM A 276, ASTM A 313, ASTM A 666

Applications

Orthodontic arc wire, catheters, guide wires, surgical instruments, implant, springs and needles

Description

This austenitic stainless steel is initially electric-arc melted. To minimize voids and contaminants while yielding a more uniform chemistry, ingots are Vacuum Arc Remelted (VAR). This refinement to the purity and homogeneity of the metal produces an high reliability product.

Chemistry Typical

Carbon: 0.08 Max
Manganese: 2.00 max
Phosphorus: 0.040 max
Sulfur: 0.030 max
Silicon: 1.00 max
Chromium: 18.00- 20.00
Nickel: 8.00- 10.50
Copper: 0.75 max
Molybdenum: 0.75 max
Iron: Balance

Physical Properties

Density: 0.29 lbs/in³ 8.03 g/cm³

Electrical Resistivity: microhm-in (microhm-cm):

At 68 °F (20 °C): 28.4 (72)

At 1200 °F (659 °C): 45.8 (116)

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Specific Heat: BTU/lb/°F (kJ/kg•K):
32 - 212 °F (0 - 100 °C): 0.12 (0.50)

Thermal Conductivity: BTU/hr/ft²/ft/°F, (W/m•K)
At 212 °F (100 °C) – 9.4 (16.2)
At 932 °F (500 °C) – 12.4 (21.4)

Mean Coefficient of Thermal Expansion: in/in/°F (µm/m•K)
32 – 212 °F (0 – 100 °C) – 9.4×10^{-6} (16.9)
32 – 600 °F (0 – 315 °C) – 9.6×10^{-6} (17.3)
32 – 1000 °F (0 – 538 °C) – 10.2×10^{-6} (18.4)
32 – 1200 °F (0 – 649 °C) – 10.4×10^{-6} (18.7)

Modulus of Elasticity: ksi (MPa)
 28×10^3 (193×10^3) in tension
 11.2×10^3 (78×10^3) in torsion

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

Melting Range: 2550 - 2650 °F (1399 - 1454 °C)

Forms

Coil – Strip, Foil, Ribbon: Contact Ulbrich Stainless Steel sales for details.
Wire – Profile, Round, Flat, Square

Mechanical Properties at Room Temperature

Annealed Condition Typical:

Ultimate Tensile Strength: 75 KSI min (517 MPa min)
Yield Strength (0.2% Offset): 30 KSI min (205 MPa min)
Elongation: 40% min
Hardness: Rb 92 max

Tempered:*

304V can be supplied in various rolled tempered conditions. Contact Ulbrich Technical Service for details.

** 304V can be cold worked to extremely high tensile strengths. Contact Ulbrich Shaped Wire Technical Service for details.*

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Additional Properties

Corrosion Resistance

304V has excellent corrosion resistance and is used in many corrosive environments and atmospheres. Please refer to NACE (National Association of Corrosion Engineers) for recommendations.

Finishes

1 – Hot rolled annealed and descaled. It is available in strip, foil and ribbon. It is used for applications where a smooth decorative finish is not required.

2D – Dull finish produced by cold rolling, annealing and descaling. Used for deep drawn parts and those parts that need to retain lubricants in the forming process.

2B – Smooth finish produced by cold rolling, annealing and descaling. A light cold rolling pass is added after anneal with polished rolls giving it a brighter finish than 2D.

#BA – Bright annealed cold rolled and bright annealed

#CBA – Course bright annealed cold rolled matte finish and bright anneal

#2 – Cold Rolled

2BA – Smooth finish produced by cold rolling and bright annealing. A light pass using highly polished rolls produces a glossy finish. A 2BA finish may be used for lightly formed applications where a glossy finish is desired in the formed part.

Polished – Various grit finish for specific polish finished requirements

** Not All Finishes are Available for All Alloys – Consult Sales for Applicable Finishes.*

Wire Finishes

XC – Extra clean bright annealed or bright annealed and cold rolled

Grease – Ultra-bright finish (for decorative applications)

Soap – Soap is not removed from tempered wire to act as a lubricant.

** Contact Ulbrich Wire with special finish requests.*

Cold Forming

304V is ductile and can be cold worked by stamping, drawing, bending or forming methods.

Heat Treatment

304V can only be hardened by cold working.

Welding

For best results refer to: SSINA's "Welding of Stainless Steels and Other Joining Methods".

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