



Haynes® 263 (Alloy 263), UNS N07263

Shaped, Flat, Square, Round, Fine Wire, Plated and Bare wire
AMS 5872, AMS 5886, MSSR 7036

Haynes® 263 or Alloy 263 Description

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Alloy 263 is a nickel-cobalt-chromium-molybdenum alloy designed specifically to combine very good strength properties with excellent fabrication characteristics in the annealed condition. The alloy is also age hardenable. While its strength at elevated temperatures is not quite as high as materials such as Waspaloy or alloy R-41, it is far easier to form and weld. Alloy 263 exhibits excellent intermediate temperature tensile ductility, and is not normally subject to strain age cracking problems common for gamma prime strengthened alloys.

Applications

Gas turbine components
Heat treat equipment
High temperature/high strength applications

Chemistry Typical

Nickel: Balance
Cobalt: 19.00 – 21.00
Chromium: 19.00 – 21.00
Molybdenum: 5.60 – 6.10
Titanium: 1.9-2.4
Titanium + Carbon: 0.04-0.08
Aluminum: .060 max

Manganese: 0.60 max
Silicon: 0.40 max
Iron: 0.70 max
Boron: 0.005 max
Copper: 0.20 max
Sulfur: 0.007 max
Silver: 0.0005 max
Bismuth: 0.0001 max

Physical Properties

Density: 0.302 lbs/in³, 8.36 g/cm³

Electrical Resistivity: micro-ohm-in, (micro-ohm-cm):
(21°C): 45.3(115)

70°F

Mean Coefficient of Thermal Expansion: $\mu\text{in/in-}^\circ\text{F}$ ($\mu\text{m/m-}^\circ\text{C}$)

70-200°F (25-100°C): 6.2(11.1)
70-400°F (25-200°C): 6.7(12.1)
70-600°F (25-300°C): 7.1(12.7)
70-800°F (25-400°C): 7.2(12.8)
70-1000°F (25-500°C): 7.6(13.6)
70-1200°F (25-600°C): 7.9(13.9)
70-1400°F (25-700°C): 8.3(14.7)
70-1600°F (25-800°C): 9.0(15.4)
70-1800°F (25-900°C): 9.9(17.0)

Thermal Conductivity: BTU-in/ft-°F (W/m-°K)

70°F (21°C): 81(11.7)
200°F (100°C): 89(13.0)
400°F (200°C): 103(14.7)
600°F (300°C): 115(16.3)
800°F (400°C): 128(18.0)
1000°F (500°C): 141(19.7)
1200°F (600°C): 154(21.2)
1400°F (700°C): 167(23.0)

1600°F (800°C): 182(24.7)

1800°F (900°C): 195(26.8)

Modulus of Elasticity: KSI (MPa)

32.1 x 10³ (221 x 10³) in tension

Melting Range: 2370-2470°F (1300-1355°C)

Mechanical Properties at Room Temperature

Annealed: Typical

Ultimate Tensile Strength: *

Yield Strength: (0.2% offset) *

Elongation: *

Hardness:

Gauges up to 0.010 inches: HV 256 max

Gauges over 0.010 inches: Rb 100 max

* Contact Ulbrich Wire for additional information

Properties: Tempered

Alloy 263 can be cold rolled to achieve the temper properties required by specific customers and/or manufacturing requirements. Contact Ulbrich Wire for details.

Heat Treat Capabilities: Typical

Aged at 1472°F

Yield Strength: (0.2% offset): 87 KSI nom (600 MPa nom)

Elongation: 37% nom

Additional Properties

Corrosion Resistance

Alloy 263 exhibits good resistance to oxidizing combustion gas environments at temperatures up to about 1600°F (870°C). Refer to NACE (National Association of Corrosion Engineers) for additional 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

Cold Forming

Alloy 263 has excellent forming characteristics. The alloy has excellent ductility in the annealed condition, and thus may also be formed by cold working. Intermediate annealing in the temperature range from 1900 to 2000°F may be needed for complex component forming operations. All hot or cold-worked parts should be annealed and rapidly cooled in order to restore the best balance of properties.

Welding

Alloy 263 can be welded by both manual and automatic welding methods, including gas tungsten arc (TIG), gas metal arc (MIG), electron beam and resistance welding. Matching composition filler wire is generally used for welding alloy 263. For best results refer to: SSINA’s “Welding of Stainless Steels and Other Joining Methods”

*Haynes® Alloy 263 is a registered trademark of Haynes Alloys

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