

Description

Alloy **L605/2.4964** is a cobalt-chromium-tungsten-nickel alloy with good formability, high strength up to 1500°F (816°C), and excellent oxidation resistance up to 1800°F (980°C). It also has outstanding resistance to wear, galling, and corrosion in a wide range of environments such as marine, hydrochloric and nitric acids, and wet chlorine.

Chemical Composition

Element	Min %	Max %
C	0.05	0.15
Mn	1.00	2.00
Si	-	0.40
P	-	0.04
S	-	0.03
Cr	19.00	21.00

Ni	9.00	11.00
W	14.00	16.00
Fe	-	3.00
Co	bal	-

Mechanical Properties

- Typical annealed hardness: 20 HRC
- Approximate tensile strength (annealed): 900 - 1500 N/mm² (131 - 218 ksi)
- Approximate tensile strength (spring temper): 1400 - 1800 N/mm² (203 - 261 ksi)

Thermal & Physical Properties

- Density: 9.20 g/cm³ (0.3330 lb/in³)
- Melting Range: 1410°C (2570°F) to 1438°C (2620°F)
- Mean Coefficient of Thermal Expansion:
 - 70 to 600°F: 7.61 x 10⁻⁶ in/in/°F
 - 70 to 1000°F: 8.31 x 10⁻⁶ in/in/°F
 - 70 to 1500°F: 9.08 x 10⁻⁶ in/in/°F
- Thermal Conductivity:
 - 70°F: 88.00 BTU-in/hr/ft²/°F
 - 800°F: 134.0 BTU-in/hr/ft²/°F
 - 1200°F: 153.0 BTU-in/hr/ft²/°F

Other Designations

- W.Nr 2.4964
- UNS R30605
- AMS 5796
- AMS 5759
- ASTM F90
- ISO 15156-3 (NACE MR 0175)

Fabrication & Heat Treatment

- Annealing: 2150°F (1175°C) to 2250°F (1230°C) for at least 15 minutes, followed by water quenching or air cooling
- Hot Working: Forged from approximately 2150°F (1177°C). Below 1850°F (1010°C), the alloy is difficult to hot work
- Cold Working: Strength levels developed primarily by cold working. Total cold work reduction generally should not exceed 40%
- Stress Relieving: 400°C (750°F) to 450°C (840°F) for 2 hours, air cooled

Applications

- Gas turbine engine components
- High temperature ball bearings and bearing races
- Springs
- Heart valves
- Aerospace and power generation components

Supplied Forms

- Bar
- Wire
- Wire-Rod

Features

- Outstanding high temperature strength
- Excellent oxidation resistance up to 1800°F (980°C)

- Exceptional resistance to wear and galling
- Corrosion resistant in marine environments, acids, and body fluids

The DIN number for Alloy L605 is 2.4964.

