

Elgiloy®

**UNS R30003
W.Nr 2.4711**

Elgiloy® is a non-magnetic Cobalt-Chromium-Nickel-Molybdenum alloy having a unique combination of very high strength, excellent corrosion resistance and high fatigue strength. Elgiloy® is highly resistant to sulfide stress corrosion cracking and as a result is the alloy of choice in the most demanding sour well environments. In seawater Elgiloy® is virtually immune to crevice and stress corrosion and pitting even at the highest strength levels and can operate at cryogenic temperatures up to 850°F (454°C).

Applications include springs, torsion bars, seals, medical devices & implants and orthodontic wire.

Industries supplied include: Oil & Gas Extraction, Medical & Dental, Aerospace, Defense and Space Exploration.

Nominal Composition

| | Co | Cr | Ni | Mo | Mn | Fe | Si | C | Be | P | S |
|-----|----|----|----|----|-----|---------|-----|------|-----|-------|-------|
| min | 39 | 19 | 14 | 6 | 1.5 | | | | | | |
| max | 41 | 21 | 16 | 8 | 2.5 | balance | 1.2 | 0.15 | 0.1 | 0.015 | 0.015 |

Physical Properties

| | At 70°F | At 20°C |
|----------------------------------|--------------------------------------|---------------------------|
| Density | 0.300 lb/in ³ | 8.30 g/cm ³ |
| Modulus of Elasticity (E) | Up to 32.0 x 10 ³ ksi | 190 GPa |
| Modulus of Rigidity (G) | 11.2 x 10 ³ ksi | 77.2 GPa |
| Coefficient of Expansion | 8.4 microinches/in.-°F (70-600°F) | 15.2 x μm/m-°C (20-300°C) |
| Electrical Resistivity | 39.2 μ ohm.in | 99.6 μ ohm.cm |
| Thermal Conductivity | 86.5 Btu-in./ft. ² hr.-°F | 12.5 W/m-K |

Applicable Specifications

Wire & Bar | AMS 5833, AMS 5834, ASTM F1058, NACE MR0175 (ISO 15156-3), ISO 5832-7.

Typical Mechanical Properties – Spring Applications

| Condition | Heat Treatment | Tensile Strength | Suggested Operating Conditions |
|-----------------------------|--|----------------------------------|-----------------------------------|
| Annealed | 2048°F (1120°C) | 120 – 150 ksi (830-1035 MPa) | -300°F to 850°F (-184°C to 454°C) |
| Spring Temper | | 220 – 290 ksi (1515-2000 MPa) | -300°F to 850°F (-184°C to 454°C) |
| Spring Temper + Aged | After spring coiling. Age: 980°F (527°C) for 5 hours. | 260 – 330 ksi (1790-2275 MPa) | -300°F to 850°F (-184°C to 454°C) |

Elgiloy® is a registered trademark of Elgiloy Specialty Metals.

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