

# ELGILOY Specialty Metals – Wire Products

## Rene 41

UNS N07041  
W.Nr 2.4973

Rene 41 is a precipitation-hardenable Nickel-Chromium alloy with high strength and oxidation resistance at elevated temperatures. Rene 41 has good relaxation resistance up to 1500°F (815°C) at low loads.

Applications include springs, nozzle partitions, turbine blades and wheels, fasteners, pumps, and hot-wire foam cutters. Industries supplied include: Aerospace, Automotive, and Polystyrene Foam Manufacturing.

### Nominal Composition

|     | Cr | Co | Mo   | Fe | Ti  | Al  | Ni      | Si  | C    | S   | B     |
|-----|----|----|------|----|-----|-----|---------|-----|------|-----|-------|
| min | 18 | 10 | 9    |    | 3   | 1.4 |         |     |      |     | 0.003 |
| max | 20 | 12 | 10.5 | 5  | 3.3 | 1.8 | balance | 0.5 | 0.12 | 0.1 | 0.01  |

### Physical Properties

|                           | At 70°F                              | At 20°C                   |
|---------------------------|--------------------------------------|---------------------------|
| Density                   | 0.298 lb/in <sup>3</sup>             | 8.25 g/cm <sup>3</sup>    |
| Modulus of Elasticity (E) | 31.6 x 10 <sup>3</sup> ksi           | 218 GPa                   |
| Modulus of Rigidity (G)   | 12.1 x 10 <sup>3</sup> ksi           | 83.4 GPa                  |
| Coefficient of Expansion  | 7.0 microinches/in.-°F (70-600°F)    | 12.6 x μm/m-°C (20-300°C) |
| Electrical Resistivity    | 51.5 μ ohm.in                        | 131 μ ohm.cm              |
| Thermal Conductivity      | 62.0 Btu-in./ft. <sup>2</sup> hr.-°F | 9.0 W/m-K                 |

### Applicable Specifications

Wire & Bar | AMS 5712, AMS 5800.

### Typical Mechanical Properties – Spring Applications

| Condition            | Heat Treatment  | Tensile Strength                   | Suggested Operating Conditions     |
|----------------------|---|------------------------------------|------------------------------------|
| Annealed             | 1950°F (1065°C)   | 120 – 160 ksi<br>(830 – 1100 MPa)  |                                    |
| Spring Temper        |   | 210 – 250 ksi<br>(1450 – 1725 MPa) |                                    |
| Spring Temper + Aged | After spring coiling.<br>Solution Anneal: 1950°F (1065°C) for 4 hours.<br>Age: 1400°F (760°C) for 16 hours. | 200 – 225 ksi<br>(1380 – 1550 MPa) | -300°F to 1500°F (-184°C to 815°C) |

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