

BRIGHTRAY® alloy F is a nickel-iron-chromium electrical-resistance alloy for use at temperatures up to 1920°F (1050°C) under continuous operating conditions. Its high iron content and relatively low level of nickel make it particularly resistant to internal oxidation in atmospheres that alternate between oxidizing and reducing or carburizing. The alloy has a high temperature coefficient of resistance. BRIGHTRAY alloy F is used for heating elements in industrial furnaces.

Physical Constants & Thermal Properties

Table 2 - Physical Constants & Thermal Properties

| | |
|--|-----------|
| Density, lb/in ³ | 0.286 |
| g/cm ³ | 7.92 |
| Melting Range, °F..... | 2430-2550 |
| °C | 1330-1400 |
| Specific Heat, Btu/lb•°F | 0.107 |
| J/kg•°K | 450 |
| Permeability at 200 Oersted (15.9 kA/m) | 1.038 |
| Coefficient of Expansion, 68-212°F, 10 ⁻⁶ in/in•°F..... | 8.3 |
| 20-100°C, μm/m•°C | 15.0 |
| Electrical Resistivity, ohm•circ mil/ft | 650 |
| μohm•m | 1.08 |
| Temp. Coefficient of Resistance, | |
| 68-932°F, 10 ⁻⁶ ohm/ohm•°F..... | 160 |
| 20-500°C, μohm/ohm•°C | 290 |

Table 1 - Nominal Chemical Composition, %

| | |
|-----------------|------|
| Nickel | 37.0 |
| Iron | 42.0 |
| Chromium | 18.0 |
| Silicon | 2.3 |
| Manganese | 1.2 |
| Carbon | 0.05 |

Available Products

BRIGHTRAY alloy F is available as sheet, strip and wire.

Typical Mechanical Properties

Table 3 - Typical Mechanical Properties of Annealed BRIGHTRAY alloy F

| | |
|---|-----|
| Tensile Strength, ksi..... | 100 |
| MPa | 690 |
| Yield Strength (0.2% Offset), ksi | 54 |
| MPa | 370 |

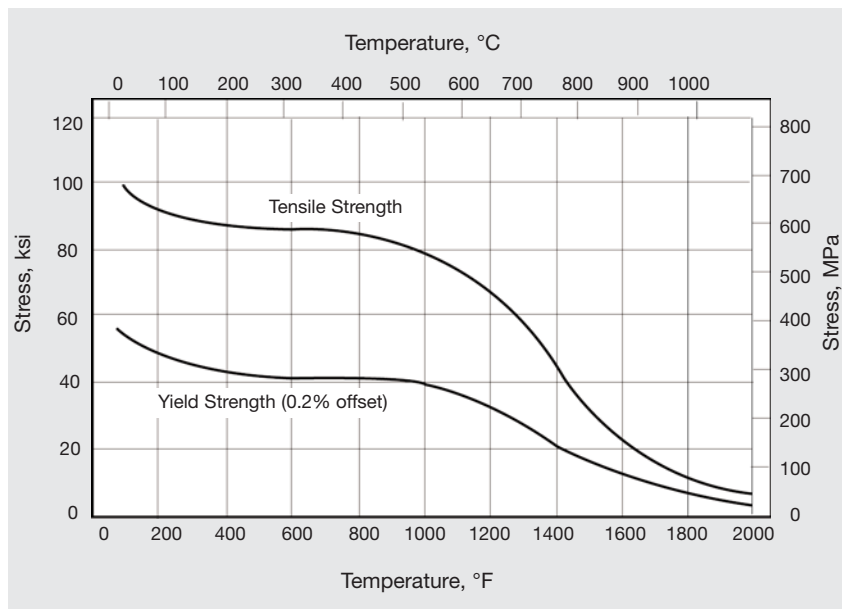


Figure 1. Typical mechanical properties of annealed BRIGHTRAY alloy F





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