

BRIGHTRAY® alloy S (UNS N06003/W. Nr. 2.4869) is a nickel-chromium electrical-resistance alloy for use at temperatures up to 2100°F (1150°C) under continuous operating conditions. It is similar to BRIGHTRAY alloy C but does not contain rare-earth additions. It has good resistance to oxidizing, neutral and reducing atmospheres. The alloy has a low temperature coefficient of resistance. BRIGHTRAY alloy S is used for heating elements in industrial furnaces.

Physical Constants & Thermal Properties

Table 2 - Physical Constants & Thermal Properties

Density, lb/in ³	0.305
g/cm ³	8.44
Melting Range, °F.....	2550-2590
°C.....	1400-1420
Specific Heat, Btu/lb•°F.....	0.100
J/kg•°K.....	419
Coefficient of Expansion, 68-212°F, 10 ⁻⁶ in/in•°F.....	6.9
20-100°C, µm/m•°C.....	12.5
Electrical Resistivity, ohm•mil/ft.....	662
µohm•m.....	1.10
Temp. Coefficient of Resistance,	
68-932°F, 10 ⁻⁶ ohm/ohm•°F.....	33
20-500°C, µohm/ohm•°C.....	60

Table 1 - Limiting Chemical Composition, %

Chromium.....	19.0-21.0
Silicon.....	0.75-1.75
Sulfur.....	0.01 max.
Iron.....	1.0 max.
Manganese.....	1.0 max.
Carbon.....	0.15 max.
Nickel (Plus Cobalt).....	Balance*

*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

Typical Mechanical Properties

Table 3 - Typical Mechanical Properties of Annealed BRIGHTRAY alloy S

Tensile Strength	
70°F, ksi.....	106.5
20°C, MPa.....	734
1110°F, ksi.....	72.8
600°C, MPa.....	502
1470°F, ksi.....	30.3
800°C, MPa.....	209

Available Products and Specifications

BRIGHTRAY alloy S is designated UNS N06003 and W. Nr. 2.4869. It is available as strip and wire.

Major specifications: DIN 17742

BRIGHTRAY® alloy S





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