



# R863.13

**EN:** 1.4862  
**Type:** Incoloy DS



R863.13 (Incoloy DS) is Fe-Cr-Ni-alloy with an addition of approx. 2% Si. This grade has good high-temperature strength and excellent resistance to oxidation and carburization. The high Si-content makes the alloy resistant to internal oxidation ("green rot") which can occur in Ni-Cr-alloys at high-temperature atmospheres that vary between oxidizing and reducing. R863.13 can be heated unlimited within the temp. range 600-900° C (1110-1650° F) without any fear of sigma phase embrittlement. Typical applications are wire for components in carburizing and carbonitriding furnaces like conveyor belts and heat treatment jigs.

## CHEMICAL COMPOSITION (Nominal) %

C	Si	Mn	Cr	Ni	Mo	N		
<0.040	2.30	1.20	18.0	36.5	<0.50	<0.080		

PRE: 20 (PRE = Cr + 3.1 x Mo + 25 x N)

Comments:

## PHYSICAL PROPERTIES

Condition: Annealed

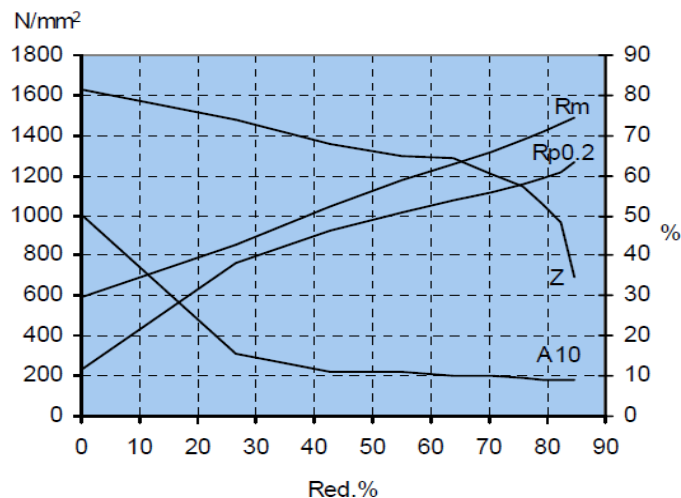
Density	7.92 g / cm <sup>3</sup>
Moduls of elasticity, E	195 000 GPa
Specific heat 0-100°C	470 J / kg°C

## TYPICAL MECHANICAL PROPERTIES

Condition: Annealed

Proof strength	Rp0.2	min. 200 N / mm <sup>2</sup>
Tensile strength	Rm	550-650 N / mm <sup>2</sup>
Elongation	A10	min. 45 %

## DEFORMATION GRAPH



## THERMAL TREATMENT

	°C	°F
Annealing temperature	1080-1120	1980-2050

## MAX. OPERATING TEMPERATURE

	°C	°F
Scaling temp. in air	1100	2010
Oxidizing atm. intermitt. / cont.	1000-1100	1832-2012

## THERMAL CONDUCTIVITY

20 °C	12.0 W / mK

## THERMAL EXPANSION

Thermal expansion per °C x 10<sup>-6</sup> from 20°C to:

100 °C	15.0
200 °C	15.5
400 °C	16.2
600 °C	17.0
800 °C	17.8
1000 °C	18.7

## RESISTIVITY

20 °C	1000 μΩmm
200 °C	1060 μΩmm
400 °C	1125 μΩmm
600 °C	1160 μΩmm
800 °C	1190 μΩmm
1000 °C	1220 μΩmm