



FSAB grade R 868.11

Corresponding standards
 AISI: 330Cb
 W.nr: 1.4887

R868.11 (330 Cb) is similar to R860.13 (Type 330) with columbium added as a stabilizing agent to prevent precipitation of carbides and with improved mechanical properties. A higher Silicon content also improves its resistance to oxidation and carburization. This grade is recommended for products extended exposure in the 650-930°C (1200-1700°F) range and where the maximum temperature does not exceed 1120°C (2050°F). It has good resistance to carburizing and carbonitriding at temperatures up to 980°C (1800°F). Like R860.13 can suffer from excessive grain growth. Typical applications are wire for heat-treating baskets, furnace fans and shafts, conveyors and for gas turbine parts.

Chemical composition (nominal)%

C	Si	Mn	Cr	Ni	Mo	N	Nb
<0.030	1.85	0.50	19.5	34.5	<0.30	0.060	0.85

PRE : 21
 (PRE=Cr+3.1xMo+25xN)

Physical properties in annealed cond.

Density (g/cm ³)	8.0
Moduls of elasticity, E (GPa)	196 000
Specific heat 0-100°C (J/kg°C)	460

Resistivity (microhm - mm)

20°C	1200	650°C	1130	870°C	1240
400°C	1110	750°C	1200	1000°C	1270

Typical mechanical properties

Condition: annealed

Proof strength Rp0.2 (N/mm ²)	min. 180
Tensile strength Rm (N/mm ²)	500-620
Elongation A10 (%)	min. 40

Thermal conductivity (W/mK)

20°C	12.4	650°C	23.4	870°C	24.6
400°C	19.0	750°C	23.8	1000°C	26.2

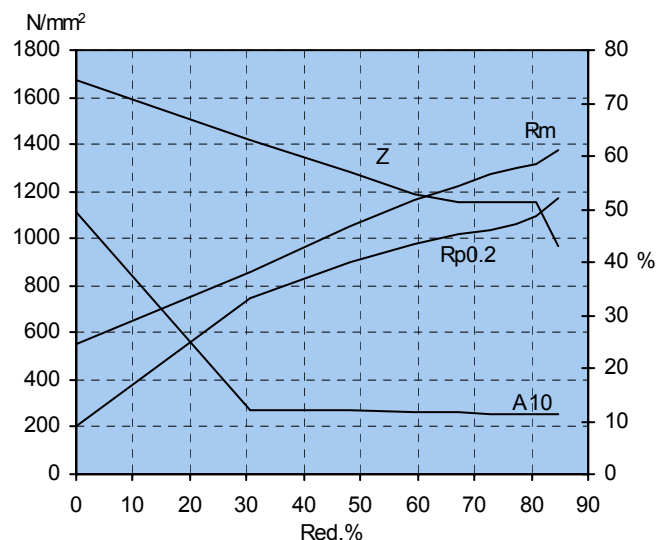
Thermal expansion per °C, x 10⁻⁶ from 20°C to

200°C	15.5	800°C	17.7
400°C	16.0	1000°C	18.0
600°C	17.0		

Thermal treatment

Annealing temp. 1050-1100°C/1920-2010°F

Deformation graph



Max. operating temp. in different atmospheres

Oxidizing atm. intermitt./cont.	1070°C/1150°C
Oxidizing sulphurous atm.	930°C/1700°F
Reducing sulphurous atm.	930°C/1700°F
Carburizing/carbonitriding atm.	980°C/1800°F
Diss. ammonia and hydrogen atm.	1095°C/2000°F

Delivery forms

Standard sizes (mm) 5.6, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, 13.5

Tolerances (mm)	5.6 -10.0 mm	± 0.15
	10.5 -13.5 mm	± 0.20

Ovality max. 60% of the tot. tol. range

Surface condition 5.6 -10 mm seam depth ≤ 0.10 mm
 >10 mm max. 1% of the diameter