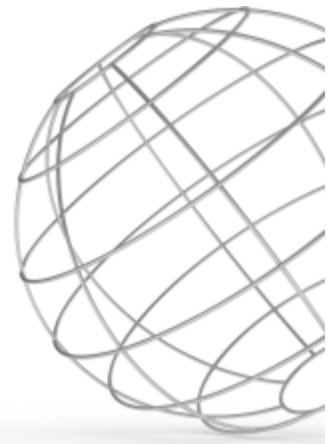




# R109.11

**EN:** 1.4512  
**Type:** 409Ti



R109.11 is a nonhardenable ferritic stainless steel micro-alloyed with titanium and manganese that combine good elevated temperature- and corrosion resistance (up to approx. 750°C (1380°F)). This steel was primarily intended for different parts in automotive exhaust systems, where metal temperatures in catalytic converters can exceed approx. 500°C (930°F). R109.11 exhibits superior resistance to the acid-corrosive condition that exists around these systems. R109.11 is also resistant to corrosion in fresh water, organic materials and mild acids. Other potential applications are fuel filters, structural supports and hangers and pipe and emission control units.

## CHEMICAL COMPOSITION (Nominal) %

C	Si	Mn	Cr	Ni	Mo	N	Ti
<0.030	0.50	0.55	11.3	<0.50	<0.10	<0.040	0.30*

PRE: 12 (PRE = Cr + 3.1 x Mo + 25 x N)

Comments: \*min 6x(%C+%N)

## PHYSICAL PROPERTIES

Condition: Annealed

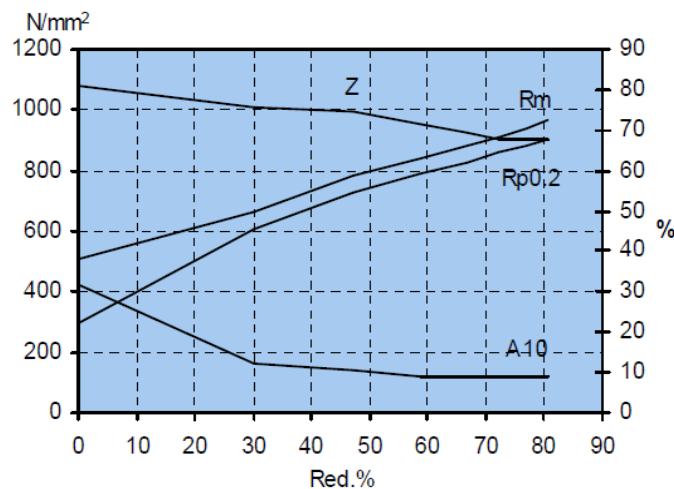
Density	7.6 g / cm <sup>3</sup>
Modulus of elasticity, E	208 000 GPa
Specific heat 0-100°C	460 J / kg°C

## TYPICAL MECHANICAL PROPERTIES

Condition: Annealed

Proof strength	Rp0.2	min.200 N / mm <sup>2</sup>
Tensile strength	Rm	400-480 N / mm <sup>2</sup>
Elongation	A10	min.20 %

## DEFORMATION GRAPH



## THERMAL TREATMENT

Annealing temperature	750-800 °C
	1380-1470 °F

## MAX. OPERATING TEMPERATURE

Operating temp. in air	730 °C
	1350 °F
Scaling temp. in air	°C
	°F

## THERMAL CONDUCTIVITY

20 °C	25.7 W / mK
100 °C	25.8 W / mK
300 °C	26.4 W / mK
400 °C	26.9 W / mK
500 °C	27.5 W / mK
800 °C	30.7 W / mK

## THERMAL EXPANSION

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

100 °C	11.0
200 °C	11.3
300 °C	11.5
400 °C	12.0
500 °C	12.0
650 °C	12.8

## RESISTIVITY

20 °C	600 μΩmm