



## SINOXX 4913 Steel

### Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4913	PK323	1.4913	-	X19CrMoNbVN11-1	-

### Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.19	0.30	0.55	10.75	0.75	0.55	0.20	-	Nb=0.33, N=0.08, B=max. 0.0015

### Description

SINOXX 4913 is a creep-resistant material that is generally used for temperatures up to 600°C.

### Applications

Application area: For fastening elements in thermal energy plants, screws, nuts.

### Physical properties (average values) at ambient temperature

Modulus of elasticity [ $10^3 \times \text{N/mm}^2$ ]: 216, 200 (200°C), 179 (400°C), 127 (600°C)

Density [ $\text{g/cm}^3$ ]: 7.7

Thermal conductivity [ $\text{W/m.K}$ ]: 29.5

Electric resistivity [ $\text{Ohm mm}^2/\text{m}$ ]: 0.60

Specific heat capacity [ $\text{J/g.K}$ ]: 0.46

Magnetisable: Yes

### Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

20-100°C	20-600°C
10.5	12.5

### Annealing

Heat to 670-720°C, min. 2 hours. Structure is martensite.

### Quenching

Harden from a temperature of 1100-1130°C followed by air or oil quenching.

### Mechanical properties at at ambient temperature

Condition: Quenched and tempered,  $d \leq 160 \text{ mm}$

0.2 % proof stress:  $750 \text{ N/mm}^2$

Tensile strength:  $900-1050 \text{ N/mm}^2$

Elongation: 12%

Reduction: 40%

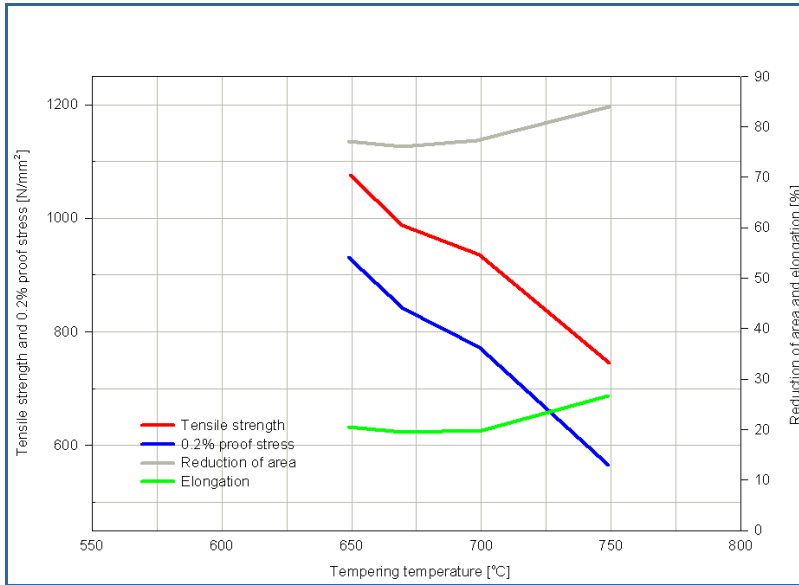
Charpy notch (ISO-V): 20 J (Longit.)

**0.2 % Proof Stress in N/mm<sup>2</sup> vs. Temperature in °C**  
**Thickness <=160 mm, QT Condition**

100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C	600°C
701	676	651	643	627	610	577	544	495	412	305

Mechanical properties at elevated temperatures

**Diagram Tempering Temperature - Mechanical Properties**



**1% Creep Stress in N/mm<sup>2</sup> vs. Temperature in °C**

Hours	450°C	500°C	550°C	600°C
10 000	500	374	250	133
100 000	448	298	153	-

**Creep Rupture Stress in N/mm<sup>2</sup> vs. Temperature in °C**

Hours	450°C	500°C	550°C	600°C
10 000	559	417	288	155
100 000	500	349	161	65
200 000	486	330	130	49

**Forging**

Hot forming temperature: 1100-850°C, slow cooling.

**Machinability**

Metal cutting machining is the same as that for special engineering steel grades of corresponding strength.

**Welding**

PK323 should not be welded.

Note: Quenching and tempering treatment must always be carried out after hot forming.

Forms manufactured: Please see the [Dimensional Sales Program](#).

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