



SINOXX 4922 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4922	PT929	1.4922	-	X20CrMoV11-1	-

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
0.20	max. 0.50	max. 1.00	11.25	1.00	0.55	0.30	-	-

Description

Steel SINOXX 4922 is creep-resistant material that is generally used for temperatures up to 650°C.

Applications

Component parts for steam turbines and other components, resistive to compressed hydrogen for chemical industry.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 210

Density [g/cm^3]: 7.76

Thermal conductivity [W/m.K]: 29.2

Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.65

Specific heat capacity [J/g.K]: 0.46

Modulus of Elasticity [10^3 N/mm^2]

20°C	600°C
210	180

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

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C	20-600°C	20-700°C	20-800°C
10.7	11.1	11.5	11.5	11.8	12.2	12.3	12.5

Soft Annealing

Heat to 730-780°C, cool slowly in furnace or air.

Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to 650-680°C, holding for one hour at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

Hardening

Harden from a temperature of 1020-1070°C followed by air or oil quenching. Structure is martensite.

Tempering

Tempering temperature: 720-780°C.

Mechanical Properties at Room Temperature

Size range mm	Heat treatment condition	0.2 % proof stress (N/mm ²)	Tensile strength (N/mm ²)	Elongation (%)	Notch impact energy (ISO-V) (J)
d<=100	+Q+T	500	700-850	16 (Long) 14 (Trans)	29 (Long) 27 (Trans)
d<=250	+Q+T	500	700-850	16 (Long) 14 (Trans)	31 (Long) 27 (Trans)
251-330	+Q+T	500	700-850	16 (Long) 14 (Trans)	27 (Long) 27 (Trans)

0.2 % Proof Stress (N/mm²) at Elevated Temperatures

Diameter (mm)	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C	600°C
Up to 160	460	445	430	415	390	380	360	330	290	250	160

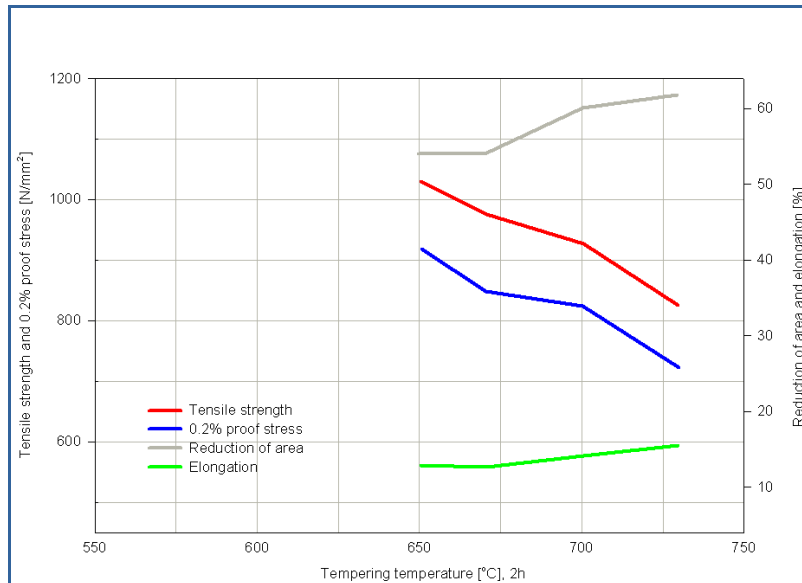
1 % Creep Limit (N/mm²) vs. Temperature (°C)

Hours	480°C	500°C	520°C	540°C	560°C
10 000	299	247	207	170	135
100 000	236	190	147	114	85

Creep Rapture Strength (N/mm²) vs. Temperature (°C)

Hours	480°C	500°C	520°C	540°C	560°C
10 000	345	294	253	213	173
100 000	284	235	186	147	112
200 000	262	215	167	128	96

Diagram Tempering Temperature - Mechanical Properties



Forging

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

Machinability

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

Welding

Steel SINOXX 4922 is weldable. Preheating and slow cooling after welding are recommended.

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

Disclaimer

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