



SINOXX 4120 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4120	PK320	1.4120	X20CrMo13	-	-

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
2.05	0.25	0.30	11.50	-	-	-	-	-

Description

SINOXX 4120 is stainless, heat resistant steel up to temperature of 550°C. Steel is resistant to water with a low chlorine content in fine-machined or, better still, polished condition.

Applications

Owing to its greater high-temperature strength and corrosion resistance - resulting from the addition of molybdenum - PK320 is used for shafts and blades in water and steam turbine systems. One special field of application is for bedknives in the cellulose industry.

Physical properties (average values) at ambient temperature

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

Density [g/cm^3]: 7.7

Thermal conductivity [W/m.K]: 25.0

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

Specific heat capacity [J/g.K]: 0.43

Magnetisable: Yes

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
11.7	12.0	12.4	12.9	13.3	13.6	14.0

Annealing

Heat to 750-850°C, cool slowly in furnace. Tensile strength is max. 770 N/mm^2 . Structure is ferrite with spherical carbides.

Quenching

Harden from a temperature of 950-1000°C followed by oil quenching.

Tempering

Tempering temperature: 650-750°C, then air cooling. Structure is transformation structure with ferrite.

Mechanical properties at at ambient temperature

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

Hardness: max. 220-280 HB

0.2 % proof stress: 550 N/mm^2

Tensile strength: 750-900 N/mm^2

Elongation: 14%

Charpy notch (ISO-V): 28 J (Longit.)

0.2 % Proof Stress in N/mm² vs. Tempering Temperature in °C

100°C	150°C	200°C	250°C	300°C	350°C	400°C
520	510	500	490	480	450	410

Forging

Hot forming temperature: 1100-800°C, slow cooling.

Machinability

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

Welding

Only limited weldability using the manual arc, resistance and TIG welding process, as hardening occurs in the heat-affected zone. Filler material is Themanit or 1520.

Note: PK320 is primarily supplied in quenched and tempered condition. It can be set to other strength ranges. It must be borne in mind in this context that the temperature range between 420 and 520 must be avoided owing to embrittlement at 475°C.

Note: Optimum corrosion resistance is only ensured with a bright metallic surface.

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

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