

SINOXX 4057 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4057	PK2SP	1.4057	X17CrNi16-2	X17CrNi16-2	431

Chemical Composition (in weight %)

С	Si	Mn	Cr	Мо	Ni	V	W	Others
0.17	max. 1.0	max. 1.50	16.00	-	2.00	-	-	-

Description

SINOXX 4057 is a martensitic stainless combining excellent impact strength at high hardness levels with the best corrosion resistance of any martensitic stainless steels. Steel with high polishability. For application up to working temperature 500°C.

Applications

SINOXX 4057 has been successfully used in a variety of aircraft and general industrial applications. These include fasteners, shafts, bolts, valve components and chemical equipment, components for dairies, machine building and paper industry.

Physical properties (average values) at ambient temperature

Modulus of elasticity [10³ x N/mm²]: 216 Density [g/cm³]: 7.70 Thermal conductivity [W/m.K]: 25.0 Electric resistivity [Ohm mm²/m]: 0.70 Specific heat capacity[J/g.K]: 0.46

Modulus of Elasticity [10³ N/mm²]

20°C	200°C	400°C
216	205	190

Coefficient of Linear Thermal Expansion 10⁻⁶ °C⁻¹

20-100 ^o C	20-200 ^o C	20-300°C	20-400 ^o C	20-500°C	20-600°C	20-700 ⁰ C
11.2	11.5	11.7	11.9	12.0	12.1	12.0



Soft Annealing

Heat to 660-750°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 295.

Hardening

Harden from a temperature of 980-1030°C followed by oil or air quenching. Hardness after quenching is about 47 HRC.

Tempering

Tempering temperature: For Q+T 800: 750-800°C. For Q+T 900: 600-650°C.

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

Condition	100°C	150°C	200 ^o C	250 ^o C	300°C	350°C	400 ^o C
Q+T 800	515	495	475	460	440	405	355
Q+T 900	565	525	505	490	470	430	375



Forging

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

Machinability

In the fully annealed condition, 431 will gall and build up on the tools. Good surface finishes are not easily obtained.

Corrosion Resistance

431 is superior to all other martensitic grades in terms of corrosion resistance. Will resist dilute acids and alkalis, neutral and basic salts, food acids, fresh water and atmosphere.

Welding

Most electric welding procedures have proven successful with 431 stainless. Filler metal should be AWS E/ER410.To avoid cracking, pre-heat the workpiece to 204-316°C. After air cooling, treat at 649°C to reattain maximum properties.

Embrittlement: It must be in mind that the temperature range between 425 and 525 °C must be avoided owing to embritlement at 475 °C.

Cold working

This alloy is easily drawn, spun, headed, sheared and bent compared with other stainless steels.

Forms manufactured: Please see the Dimensional Sales Program.

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