



SINOXX 4305 Steel

Designation by Standards

Brand Name	Ravne	Mat. No.	DIN	EN	AISI/SAE
SINOXX 4305	PK11S	1.4305	-	X8CrNiS18-9	303

Chemical Composition (in weight %)

C	Si	Mn	Cr	Mo	Ni	V	W	Others
max. 0.10	max. 1.00	max. 2.00	18.00	-	9.00	-	-	max. Cu=1.00

Description

303 is one of the most popular of all the free machining stainless steels. It offers good strength, corrosion resistance and great machinability. It will resist scaling at temperatures up to 871°C.

Applications

Used in an incredibly wide variety of parts both in screw and general machining industries. Applications include hardware, fasteners, valve parts, nozzles and trim. For the food processing industry, dairies, fotografic industry, for paint, soap, paper and textile production.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 203, 186 (200°C), 172 (400°C)

Density [g/cm^3]: 7.9

Thermal conductivity [W/m.K]: 14.6

Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.73

Specific heat capacity [J/g.K]: 0.502

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
16.0	17.0	17.0	18.0	18.0

Hardening

Harden from a temperature of 1020-1070°C followed by water quenching. Structure is austenite with small ferrite component.

Mechanical properties in solution-annealed condition and resistance to intercrystalline corrosion

Hardness: 130-190 HB

0.2 % proof stress: 190 N/mm^2 (for $d \leq 160$)

1.0 % proof stress: 225 N/mm^2 (for $d \leq 160$)

Tensile strength: 510-750 N/mm^2

Elongation: 35% (for $d \leq 160$, longit.)

Resistance to intercrystalline corrosion: no (in as delivered condition), no (in sensitised condition)

Note: Sensitisation treatment for 15 min at 700°C with subsequent cooling in air.

Mechanical Properties At Elevated Temperatures

Temperature	100°C	200°C	300°C	400°C	450°C	500°C	550°C
0.2 % proof stress in N/mm ²	176	155	136	125	121	119	118

Forging

Hot forming temperature: 1150-850°C.

Machinability

Excellent speeds and feeds are capable with this material. The addition of sulfur causes a very brittle chip. Many companies now offer premium machinability grades, such as CarTech with their Project 70 and 7000 series.

Corrosion Resistance

Resistant to a variety of organic and inorganic chemicals, fresh water and atmospheric corrosion.

Welding

Although not recommended, welding may be performed if low temperatures are employed. Recommended filler metal is AWS E/ER312. At high temperature, the sulfur in 303 tends to precipitate at the weld boundary resulting in weak and brittle joints.

Cold working

Minor deformation is possible with this alloy, although it is not its strong point. Type 303 Se is superior in this aspect.

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

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