AISI 303 Stainless Steel Data Sheet

GNEE STEEL

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AISI 303 is an austenitic free-cutting stainless steel belonging to the 300 series stainless steel (the corresponding Chinese grade is approximately Y12Cr18Ni9). Its main feature is that free-cutting elements such as sulfur (S) or selenium (Se) are added to 304 stainless steel, which significantly improves the cutting performance of the material while

AISI 303 Stainless Steel – Equivalent Grades

Standard System	Equivalent Grade / Designation
EN / DIN	1.4305 / X8CrNiS18-9
ISO	X8CrNiS18-9
China (GB)	06Cr19Ni10S / Y1Cr18Ni9
Japan (JIS)	SUS303
UK (BS)	303S31
France (AFNOR)	Z10CNF18-09
Italy (UNI)	X8CrNiS18-9
Russia (GOST)	12X18H9S (12Kh18N9S)

Composition Specification (%)

Grade		C	Mn	Si	P	S	Cr	Mo	Ni	Se
303	min.	-	-	-	-	0.15	17.0	-	8.0	-
	max.	0.15	2.0	1.0	0.20	-	19.0		10.0	
303SE	min.	-	-	-	-	-	17.0	-	8.0	0.15
	max.	0.15	2.0	1.0	0.20	0.06	19.0		10.0	min.

Mechanical Property Specification

Grade	Tensile Strength (MPa)	Yield Strength 0.2% Proof (MPa)	Elongation (% in 50mm)	Hardness	
				Rockwell B (HR B)	Brinell (HB)
303	650 typical	300 typical	45 typical	-	262 max.

AISI 303 Stainless Steel – Physical Properties

Property	Typical Value
Density	7.85 g/cm³ (7850 kg/m³)
Melting Range	1400–1455 °C
Thermal Conductivity	16.3 W/m·K (at 100 °C)
Specific Heat Capacity	500 J/kg·K
Electrical Resistivity	0.72 μΩ·m (at 20 °C)
Modulus of Elasticity	~193 GPa
Thermal Expansion Coefficient	17.3 × 10^{-6} /K (20–100 °C)
Magnetic Properties	Non-magnetic (in annealed condition)