

## 431 Martensitic Stainless Steel

Typical Analysis (Ave. values %)	C	Si	Mn	Cr	Ni	S	P
	0.19	0.25	0.40	15.9	1.6	0.025	0.025
NEAREST  STANDARD	AS		DIN		SIS		AISI
	431		1.4057 X20CrNi16-2		2321		431

DESCRIPTION	Heat treated 850 – 100 Nmm <sup>2</sup> martensitic, nickel bearing grade. Good corrosion resistance, excellent tensile and torque strength and good toughness. This grade can not be readily cold worked and is therefore not recommended for cold heading and bending
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APPLICATIONS	Pump shafts, nuts & bolts, studs, valve parts, or other use where high tensile properties are required. <b>NOTE: Other stainless steels which may be considered for these applications are BOHLER M303; UDDEHOLM Ramax; Corrax and 17-4 PH.</b>
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MECHANICAL PROPERTIES H & T 60-160 MM	Tensile Strength MPa	Yield Strength MPa	Elong %	Impact Strength J
	850 - 1000	600	12	25

HEAT TREATMENT	Forge	800-100°C. Cool in furnace
	Anneal	680-800°C. Cool slowly in controlled furnace.
	Harden	950-1050°C Oil or Air.
	Temper	600-650°C hold for 1 hour min. at temperature, air cool.

PHYSICAL PROPERTIES	Density (kg/dm <sup>3</sup> )	7.85
	Modulus of elasticity 10 <sup>3</sup> N/mm <sup>2</sup>	215
	Thermal conductivity W/(m.K)	25
	Electric resistivity Ohm.mm <sup>2</sup> /m	0.70
	Specific heat capacity J/(kg.K)	460
	Thermal expansion 10 <sup>6</sup> m/(m.K)	10

**WELDING**

For joint welding, preheat parts to a temperature of 250-450°C. For building up preheat to 100-200°C. To increase toughness in the heat affected zone of the base metal, anneal welding joints at 650-750°C or conduct a new heat treatment cycle. Use Bohler SKWAM electrodes or SKWAM-IG for MIG or TIG.