

1.4418 has higher tensile properties, excellent ductility and better corrosion resistance than ordinary 400 series martensitic materials, very good corrosion resistance in corrosive media and very good mechanical and impact properties, At the same time reduced carbon content, good corrosion resistance and low temperature toughness up to -200°C In the quenched and tempered state, the structure of X4CrNiMo16-5-1 consists of tempered martensite + stabilized austenite and a small amount of ferrite . The number and distribution of these phases is strictly dependent on the chemical equilibrium. In the quenched state, higher Rm and HB values are obtained, reaching a maximum after tempering at about 450°C. Raising the temperature above 500°C begins to form finely dispersed stable austenite, reaching a maximum around 610°C. This stabilized austenite has good toughness even at low temperatures and does not later transform into martensite. cool down. Conversely, at temperatures above A1 (e.g. 620°C), some austenite becomes unstable and transforms into martensite after cooling from temperatures below Ms. This behavior requires further tempering to avoid stress conditions that can lead to quench cracking and stress corrosion.

Applications include turbine parts, propeller shafting, shafting, piston rods and hydropower plant equipment, compressors, pumps, turbines, oil and gas industries, turbine subassemblies, nuts and bolts, shafts, pins, pistons, spindles, crankshafts, In chemical, energy, marine, shipbuilding, aviation/cryogenic industries.

## Applications

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## Equivalent or Similar Grades - Chemical Composition

Grades	Chemical Composition WT %								
	C	Mn	Si	P	S	Cr	Ni	Mo	N
<b>X4CrNiMo16-5-1, 1.4418</b>	Max 0.6	Max 1.5	Max 0.7	Max 0.04	Max 0.03	15.0 - 17.0	4.0 - 6.0	0.8 - 1.5	Min 0.02
<b>Z6CND16-05-01</b>	Max 0.06	Max 1.0	Max 1.0	Max 0.040	Max 0.025	15.0 - 17.0	3.5 - 5.5	0.80 - 1.25	-
<b>Z8CND17-04</b>	0.05	0.75	-	-	-	16.0	5.0	1.0	0.03
<b>S165M, SS 2387</b>	Max 0.05	Max 1.5	Max 1.0	Max 0.045	Max 0.030	15.0 - 17.0	4.0 - 6.0	0.8 - 1.5	-

## Mechanical Properties

### Annealed condition +A

- Dimensions Max 16mm
  - Tensile strength, Rm: <1150 MPa
  - Hardness, HB: <380
- Dimensions Min 16mm
  - Tensile strength, Rm: 1100 MPa
  - Hardness, HB: 320

### +QT 760

- Tensile strength, Rm: 760 - 960 MPa
- The yield point, Re: Min 550 MPa
- Elongation, A: Min 16%
- Impact resistance for dimensions KV20°C: Min 70J

### +QT 900

- Tensile strength, Rm: 900 - 1150 MPa
- The yield point, Re: Min 700 MPa
- Elongation, A: Min 10%
- Impact resistance for dimensions KV20°C: Min 60J

## +QT 840

- Tensile strength, Rm: 840 - 1100 MPa
- The yield point, Re: Min 660 MPa
- Elongation, A:Min 14%
- Impact resistance for dimensions KV20°C: Min 55J

## Thermal Properties

Properties		Temperature						
		100°C	150°C	200°C	250°C	300°C	350°C	400°C
p0,2 (MPa)	+QT760	Min 520	Min 510	Min 500	Min 490	Min 480	-	-
	+QT900	Min 660	Min 640	Min 620	Min 600	Min 580	-	-
	+QT840	Min 660	Min 640	Min 620	Min 600	Min 580	-	-
Modulus of elasticity, E (GPa)	195	-	185	-	175	-	170	
-1)	10,3	-	10,8	-	11,2	-	11,6	

## Processing Performance

The machinability of this grade of stainless steel is directly related to its hardness. 1.4418 machines similar to carbon steels of the same hardness. Although it must be realised that the machining parameters will vary depending on the heat treated condition and hardness of the steel, the following parameters can be used as a guideline