

## 4145H MODIFIED HIGH TENSILE STEEL

Chromium/Molybdenum high tensile steel has good ductility, shock resistance and wear resistance. 4145H modified conforms to API Spec 7. Typical uses are: drilled collars, connecting rods, shafts, gears

Colour Code	Stocked Sizes	
Silver/Green(Bar End) 	Rounds	
	Hexagons	
	Hollow Bar	
	Square	
	<b>Bar Finish</b>	
	Peeled, Black Bar	

### Related Specifications

Australia	
Germany	
Great Britain	
International	API Spec 7
Japan	
USA	SAE J1268, UNS H41450, ASTM A304

### Chemical Composition (Base Material)

	Min. %	Max %
Carbon	0.42	0.49
Silicon	0.15	0.35
Manganese	0.65	1.10
Chromium	0.75	1.20
Molybdenum	0.15	0.25
Phosphorous	0	0.035
Sulphur	0	0.04
Nickel	0	0.25
Copper	0	0.35

### Mechanical Property Requirements for Steels in the Heat-Treated Condition for Peeled, Black Bar

Mechanical Property Designation	API - 7	
Limited Ruling Section mm		
Tensile Strength Mpa	Min	970
	Max	
0.2% Proof Stress Mpa	Min	755
Elongation on 5.65√S <sub>0</sub> %	Min	13

Izod Impact J	Min	
Charpy Impact J	Min	54
Hardness Brinell HB	Min	
	Max	341

**Forging**

Heat to 1200 °C maximum, hold until temperature is uniform throughout the section. Do not forge below 950 °C.

**Heat Treatment**

**Annealing**

Heat to 815 °C - 850 °C, hold until temperature is uniform throughout the section.

**Flame or Induction Hardening**

**Hardening**

Heat to 820 °C - 870 °C, hold until temperature is uniform throughout the section. Quench in oil as required.

**Nitriding**

**Normalizing**

Heat to 870 °C - 900 °C, hold until temperature is uniform throughout the section, soak for 10 - 15 minutes and cool in still air.

**Stress Relieving**

**Tempering**

Re-heat to 430 °C - 700 °C as required and according to properties required.

**Notes on Heat Treatment**

**Machining**

**Welding**

Best results by common fusion or resistance methods. Do not weld by oxyacetylene.

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