4150HT – Technical Data

General Descriptions:

4150HT is a free-machining alloy steel providing a good combination of heat treated properties and machinability.
In the heat treated condition it is 269-321 BHN.

Examples of applications:

Arbors, bolts and studs, boring bars, gears, machinery parts, shafts, spindles, vice jaws.

Chemical Composition

Carbon	Manganese	Silicon	Chromium	Molybdenum	Sulfur
0.47-0.55%	1.15-1.30%	0.20-0.30%	0.60-0.70%	0.12-0.20%	0.07-0.10%

Surface Treatment

4150HT can be nitrided using most conventional nitriding processes. Other coating or treatments usingtemperatures of 1050 °F or lower can be used.

Typical Heat Treat Response

Tempering Temp °F	Hardening Temp /HRC 1550 °F	Izod impact - Ft.-lbs
As Quenched	58-63	
400	56	
600	52	
800	46	25
1000	36	48
1200	30	55

Physical Properties

Modulus of Elasticity	29 x 10^6 psi (200 GPa)	**Density**	0.282 lb/in^3
Annealed Hardness	BHN 170-212	**Machinability**	85% of O1

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Heat Treatment

Forging

2100 °F. Do not forge below 1650°F. Slow cool after forging.

Annealing

1550 °F, hold 2 hours, slow cool (50 °F/hour maximum) to 1200 °F, then air or furnace cool to room temperature. Hardness is 170-212 BHN.

Stress Relieving

Prehardened Material: 1000 °F, hold 2 hours, air cool.
Annealed Material: 1100-1300 °F, hold 2 hours, air cool.

Hardening

Preheat to 1300-1350 °F, equalize.

High Heat (Austenitizing)

1525-1575 °F, soak 10 to 30 minutes at temperature.

Quench

Oil quench to below 200 °F. Large or complicated sections may be quenched to about 350 °F, followed by air cooling to 250 °F.
Temper immediately.

Tempering

Tempering at 900-1300 °F for 1 hour per inch of thickness at temperature is recommended, 2 hour minimum.