Our competition parts are made from this or similar lower grade steels

6150, 6150H

Chemical Composition. **6150. AISI and UNS:** 0.48 to 0.53 C, 0.70 to 0.90 Mn, 0.035 P max, 0.040 S max, 0.15 to 0.30 Si, 0.80 to 1.10 Cr, 0.15 V min. **6150H. AISI and UNS:** 0.47 to 0.54 C, 0.60 to 1.00 Mn, 0.035 P max, 0.040 S max, 0.15 to 0.30 Si, 0.75 to 1.20 Cr, 0.15 V min.

Similar Steels (U.S. and/or Foreign). **6150.** UNS G61500; AMS 6448, 6450, 6455; ASTM A322, A331; MIL SPEC MIL-S-8503; SAE J404, J412, J770; (Ger.) DIN 1.8159; (Fr.) AFNOR 50 CV 4; (Ital.) UNI 50 CrV 4; (Jap.) JIS SUP 10; (Swed.) SS_{14} 2230; (U.K.) B.S. 735 A 50, En. 47. **6150H.** UNS H61500; ASTM A304; SAE J407; (Ger.) DIN 1.8159; (Fr.) AFNOR 50 CV 4; (Ital.) UNI 50 CrV 4; (Jap.) JIS SUP 10; (Swed.) SS_{14} 2230; (U.K.) B.S. 735 A 50, En. 47

Characteristics. A medium high-carbon chromium-vanadium alloy steel which has been used for numerous applications including premium quality springs. Its as-quenched hardness is generally 55 to 60 HRC, depending on the precise carbon content. Hardenability is relatively high, approximately the same as for 4140H. The chromium content is mainly responsible for the hardenability. The vanadium serves as a grain refiner and has no significant effect on hardenability. Is forgeable, but is not recommended for welding

Forging. Heat to 1230 °C (2250 °F) maximum. Do not forge after temperature of forging stock drops below approximately 900 °C (1650 °F)

Recommended Heat Treating Practice

Normalizing. Heat to 900 °C (1650 °F). Cool in air

Annealing. For a predominantly pearlitic structure, heat to 830 °C (1525 °F), cool rapidly to 760 °C (1400 °F), then cool to 675 °C (1245 °F), at a rate not to exceed 8 °C (15 °F) per h; or heat to 830 °C (1525 °F), cool rapidly to 675 °C (1245 °F), and hold for 6 h. For a predominantly spheroidized structure, heat to 760 °C (1400 °F), and cool to 675 °C (1245 °F) at a rate not to exceed 6 °C (10 °F) per h; or heat to 760 °C (1400 °F), cool rapidly to 650 °C (1200 °F), and hold for 10 h

Hardening. Heat to 870 °C (1600 °F), and quench in oil

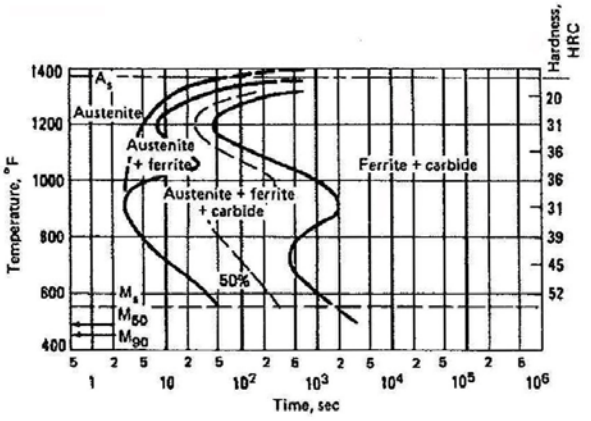
Tempering. Reheat immediately after quenching [preferably before the temperature of the parts drops below the range of 38 to 50 °C (100 to 120 °F)] to the temperature required to obtain the desire combination of mechanical properties

Austempering. For many spring applications, this steel is austempered by austenitizing at 870 °C (1600 °F), quenching in an agitated molten salt bath at 315 °C (600 °F), holding for 1 h, and air cooling. No tempering is required. Hardness after this treatment generally ranges from approximately 46 to 51 HRC

Recommended Processing Sequence

- Forge
- Normalize
- Anneal
- Rough machine
- Austenitize and quench (or austemper)
- Temper (or austemper)
- Finish machine

6150: Isothermal Transformation Diagram. Composition: 0.53 C, 0.67 Mn, 0.93 Cr, 0.18 V. Austenitized at 845 °C (1555 °F). Grain size: 9



6150: Equipment requirements for salt martempering gears

Production requirements	
Weight of each piece	0.9 kg (2 lb)
Pieces per furnace load	32
Production per hour(a)	
Number of pieces	128
Net work load	116 kg (256 lb)
Gross furnace load(b)	152 kg (336 lb)
Equipment requirements	
Martempering furnace	Immersion-heated salt pot(c)
Size of salt pot	610 by 381 by 838 mm (24 by 15 by 33 in.)
Capacity of salt pot	272 kg (600 lb)
Type of salt	Nitrate-nitrite (2% water added)
Quenching capacity of salt pot	181 kg/h (400 lb/h)
Operating temperature	205 °C (400 °F)
Agitation	Air-operated stirrer

(a) Cycle time, 15 min. (b) Work and fixtures. Each fixture weighed 9.1 kg (20 lb) empty and contained eight gears. (c) Salt pot rated at 21 kV · A (3 phase, 60 cycle, 220 to 440 V) for heating to temperature range of 175 to 400 °C (350 to 750 °F). Blower (½ hp, 3 phase, 60 cycles, 220 V) used for cooling by driving room-temperature air between wall of pot and exterior shell of furnace