DATA SHEET

LATROBE SPECIALTY STEEL COMPANY
Latrobe, PA 15650-0031 USA

Issue 1

LSS™ H10 Mod. Hot Work Tool Steel

ASTM H10A

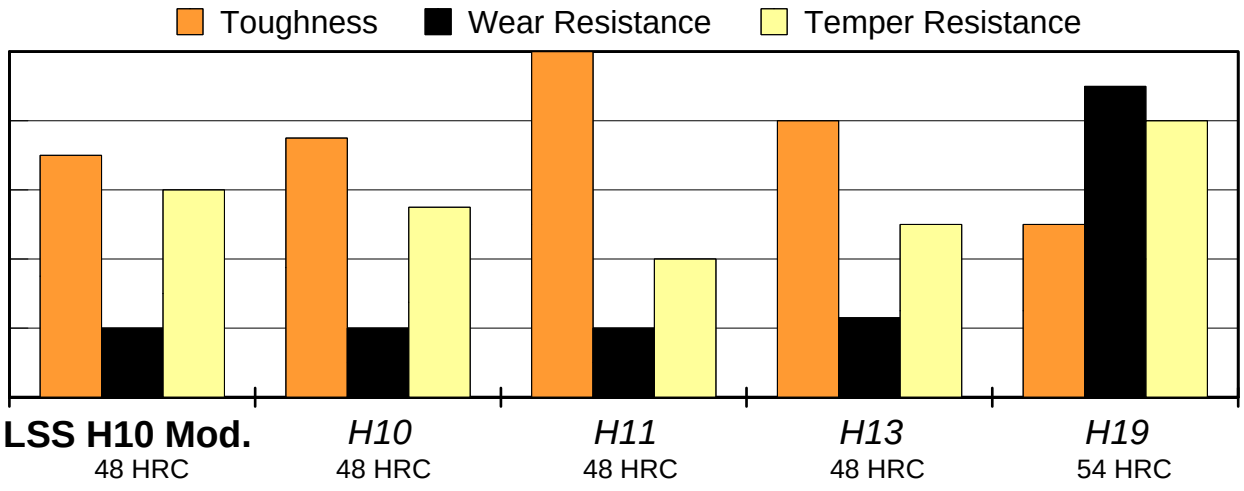
Typical Composition

C	Mn	Si	Cr	Mo	V	Co
0.35	0.30	1.00	3.30	2.45	0.65	2.00

LSS H10 Mod. hot work tool steel is a chromium-molybdenum H10-type hot work steel that contains cobalt for increased strength and resistance to softening at elevated temperature. This grade is also very resistant to thermal fatigue cracking (heat checking), and can be water cooled in service.

LSS H10 Mod. is recommended for difficult hot work tooling applications such as hot punches, die casting dies, forging dies, hot shear blades, hot gripper dies, and extrusion tooling.

Relative Properties



Physical Properties

Density: 0.281 lb/in^3 (7780 kg/m^3)
Specific Gravity: 7.78
Modulus of Elasticity : 30x10^6 psi (207 GPa)

Machinability: 90-95% of a 1% carbon steel

Coefficient of Thermal Expansion (at 47 to 48 HRC)

Temperature °F	in/in/ °F x 10^{-6}	Temperature °C	mm/mm/ °C x 10^{-6}
80 - 200	5.8	21 - 93	10.4
80 - 400	6.3	21 - 204	11.3
80 - 800	6.9	21 - 316	12.4
80 - 1200	7.3	21 - 427	13.1
80 - 1500	7.5	21 - 538	13.5

LSS™ H10 Mod.
HEAT TREATING INSTRUCTIONS

(See Tech-Topics Bulletin 102 for a more thorough explanation of heat treating.)

CRITICAL TEMPERATURE

Ac1: 1525°F (830°C)

HARDENING:

Preheating: To minimize distortion in complex tools use a double preheat. Heat at a rate not exceeding 400°F per hour (222°C per hour) to 1150-1250°F (621-677°C), equalize, then raise to 1450°F (788°C) and equalize. For normal tools, use only the second temperature as a single preheating treatment.

Austenitizing (High Heat): Heat rapidly from the preheat.
Furnace or Salt: 1900°F (1038°C)

Quenching: Air, pressurized gas, or warm oil. *For pressurized gas quenching, a minimum quench rate of approximately 50°F per minute (28°C per minute) to below 1000°F (538°C) is required to obtain the optimum properties in the steel.*

For oil, quench until black, about 900°F (482°C), then cool in still air to 150-125°F (66-51°C).

Tempering: *Temper immediately after quenching*. The typical tempering range is 1000-1150°F (538-621°C).

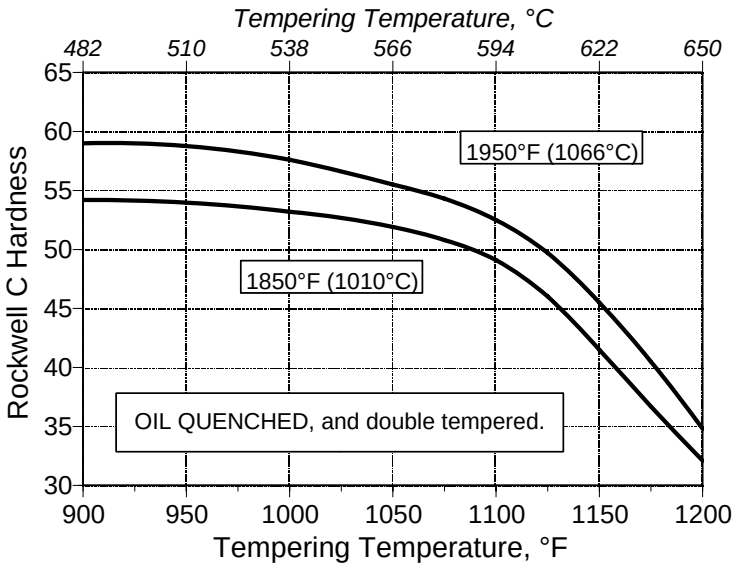
Hold at the tempering temperature for 1 hour per inch (25.4 mm) of thickness, but for 2 hours minimum, then air cool to ambient temperature. Double tempering is required. To maximize toughness and tool performance, a third temper is often used as a stress relief after all finish machining, grinding, and EDM work are completed on the tool.

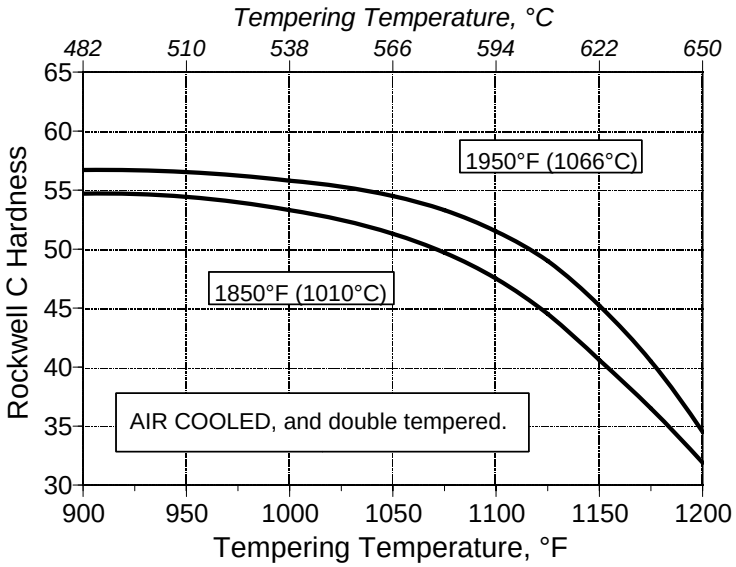
ANNEALING:

Annealing must be performed after hot working and before rehardening.

Heat at a rate not exceeding 400°F per hour (222°C per hour) to 1575-1650°F (857-899°C), and hold at temperature for 1 hour per inch of maximum thickness; 2 hours minimum. Then cool slowly with the furnace at a rate not exceeding 50°F per hour (28°C per hour) to 1000°F (538°C). Continue cooling to ambient temperature in the furnace or in air. The resultant hardness should be a maximum of 229 HBW

HEAT TREATMENT RESPONSE





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