

●●● H-10 Modified Hot Work Tool Steel



H-10 modified is a chromium-molybdenum-cobalt hot work steel that resists softening at elevated temperatures. It is an upgrade from H-13 in applications requiring improved hot hardness or heat check resistance, at a slight decrease in toughness. It may be used at tool temperatures up to about 1100°F, with brief exposures up to about 1200°F.

Chemical Composition

Carbon	0.35
Manganese	0.30
Silicon	0.90
Chromium	3.50
Molybdenum	2.50
Vanadium	0.60
Cobalt	2.00

Typical Applications

Extrusion Tooling, Hot Upset Dies, Die Inserts, Forging Dies, Die Casting Dies, Aluminum Die Casting, Dies and Inserts.



Physical Properties

Air cooled from 1900°F, triple tempered as shown.

Tempering Temperature °F	Hardness HRC	CVN
1000	58	9
1050	57	10
1100	54.5	12
1150	50.5	14
1200	40.5	15.5



● ● ● H-10 Modified Hot Work Tool Steel

Surface Treatments

Because of its high tempering temperatures (>1000°F), **H-10 modified** may be treated by most surface treating processes, including conventional and ion nitriding, titanium nitriding, and other coatings or treatments. Nitrided surface hardness will be about 60/65 HRC.

Annealing

Heat to 1625°F. Hold 2 hours at temperature. Cool slowly (40°F per hour maximum) to 1200°F, then air cool to room temperature.

OR

Heat to 1650°F. Hold 2 hours at temperature. Cool to 1350°F. Hold 6 hours at temperatures at temperature, then air cool to room temperature.

Typical Annealed Hardness – 207/241 Brinell

Welding

Use H13 or other hot work tool steel filler material.

Annealed Material: Preheat to 800/1000°F.

Maintain above 700°F during welding. Reanneal, or temper 1350°F for 6 hours.

Stress Relieving

Annealed Material: Heat uniformly to 1200/1250°F, hold two hours at temperature, cool in still air to room temperature.

Hardened Materials: Heat uniformly to 25/50°F below tempering temperature, hold two hours, cool in still air to room temperature.

Hardening

Critical Temperature: about 1550°F

Preheat: 1100/1200°F, equalize, 1400/1500°F, equalize.

High Heat: 1850/1925°F, hold 20/45 minutes at temperature

Quench: Air, positive pressure vacuum, salt, or interrupted oil to 125/150°F

Temper: 1000/1200°F, hold one hour per inch of thickness (two hours minimum. Temper three times.

This information is intended to provide general data on our products and their uses and is based on our knowledge at the time of publication. No information should be construed as a guarantee of specific properties of the products described or suitability for a particular application. Walter Metals reserves the right to make changes in practices which may render some information outdated or obsolete. Walter Metals should be consulted for current information & capabilities.

1616 Commerce Drive Stow, OH 44224
PH: 880-621-1228 FX: 330-688-0531 e-mail: wmc@waltermetals.com web: www.waltermetals.com

