NESSteel Inc.

83 Gerber Drive, Tolland, CT 06084

800-654-2901 • Fax: (860) 875-4900 sales@nessteel.com

Cold Work Tool Steel AISI A-10

A-10 is an air-hardening non-deforming tool steel with outstanding wear resistance and toughness properties. This grade contains uniformly distributed graphitic particles for good machinability and non-seizing characteristics. It also hardens from a low temperature range of 1450˚ - 1500˚F (788˚ - 816˚ C) which minimizes size change and distortion in heat treatment. This combination of properties makes A-10 steel an ideal choice for a variety of applications such as gauges, arbors, forming rolls, shear blades, and metal working dies and punches.

Typical analysis* is shown in the chart below:

C	Si	Mn	Ni	Mo
1.35	1.20	1.80	1.85	1.50

*Slight variations from the typical analysis shown may occur in order to maintain the desired graphitizing potential.

Forging:
Preheat slowly to 1500˚F (816˚C). Soak until equalized and continue heating slowly to forging temperature of 1900˚F (1038˚C) maximum. Soak until steel is heated uniformly throughout, then proceed with forging. Reheat as required to maintain a minimum forging temperature of 1500˚F (816˚C). At the completion of forging, the work piece should be air cooled.

Conditioning Forgings For Anneal:
Heat slowly to 1450˚F (788˚C) and hold at temperature until equalized. Cool to 1100˚F (593˚C) at 40˚F (22˚C) per hour, then air cool to room temperature.

Annealing:
For annealing, pack parts in a sealed container or heat in a controlled atmosphere furnace to minimize surface decarburization. Heat slowly to 1450˚F (788˚C), equalize at temperature, cool at 10˚-20˚F (6˚-11˚C) per hour maximum to 900˚F (482˚C) or under, then air cool to room temperature. Reheat to 1100˚F (621˚C). Equalize and hold for 6 hours, then air cool to room temperature. Proper annealing should result in a hardness of Brinell 269 maximum.

Hardening:
Heat slowly to 1450˚ - 1500˚F (788˚ - 816˚ C) maximum. Hold at temperature until thoroughly and uniformly heated. Then air cool to under 100˚F (38˚C), preferably to 80˚ - 90˚F (27˚-32˚C) for maximum hardness response. Pieces up to 2" (51 mm) in thickness should be austenitized at 1450˚F (788˚C), 2" - 4" (51 - 102 mm) at 1475˚F (802˚C) and over 4" (102 mm) at 1500˚F (816˚C). For large or intricately shaped sections where preheating is considered advisable, preheat to 1200˚ - 1250˚F (649˚ - 677˚C) before transferring to the hardening furnace. Best results are obtained by austenitizing in controlled atmosphere or vacuum furnaces or neutral salt baths.

Tempering:
Heat A-10 steel parts slowly to the tempering temperature, hold for one hour per inch (25 mm) of thickness and then air cool. For most applications the tempering temperature should be within 300˚ - 500˚F
(149˚ - 260˚C). Actual hardness obtained will depend on section size since it affects the quenching rate in hardening.