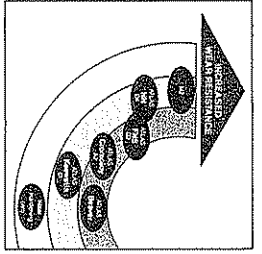


Wear Resisting Cold Work Tool Steels



Atlas Grade
AISI

Description (Analysis)

Beaver's alloy content provides a unique combination of wear resistance and toughness for heavy duty blanking and forming dies, slitter knives and shear blades. Beaver has proven to be the superior grade for blanking and forming of HSLA steels.
(C 0.68, Mn 0.45, Si 1.00, Cr 8.25, V 1.00, Mo 1.40, Ni 1.50)

ATLAS
KEEWATIN
01

A classic oil-hardening grade, Kewatin is used in a wide variety of cold work die and roll forming applications as well as for precision ground gauge stock.
(C 0.90, Mn 1.20, Si 0.30, Cr 0.50, W 0.50, V 0.15)

ATLAS
CROMOLOY
A2

Cromoloy is a general purpose air-hardening steel that provides the wear resistance, toughness and stability in hardening needed in precision punches, blanking and forming dies and draw rings. The chemistry of this grade meets GM A2363.
(C 0.98, Mn 0.70, Si 0.30, Cr 5.00, Mo 1.15, V 0.30)

ATLAS
FNS
D2

A high carbon, high chromium steel, FNS has a distinct combination of very high wear resistance and stability in hardening. It is ideal for intricate long run blanking and forming dies, roll forming and thread rolling dies, as well as heavy duty wood working knives.
(C 1.50, Mn 0.35, Si 0.30, Cr 11.50, Mo 0.75, V 0.80)

ATLAS
NN
D4

This very high carbon, high chromium steel has exceptionally high wear resistance and for this reason NN is used for molds to cold press abrasive porcelain, refractories and metal powders. It is also used for laminated blanking dies.
(C 2.25, Mn 0.30, Si 0.25, Cr 12.00, V 0.25, Mo 0.80)

THERMAL TREATMENT TEMPERATURES

ANNEALING (machinability 01-100%)	HARDENING			TEMPERING	
	Preheat	High Heat	Quench	For Maximum Wear	For Maximum Toughness
1500 to 1525°F 815 to 830°C (50%)	1500 to 1600°F 815 to 870°C	1500 to 1550°F 1035 to 1065°C	In air or salt at 1000 to 1100°F 540 to 595°C	300 to 400°F 150 to 205°C	450 to 600°F 230 to 315°C
1400 to 1450°F 760 to 785°C (100%)	1200 to 1300°F 650 to 705°C	1425 to 1500°F 775 to 815°C	In oil		
1575 to 1575°F 860 to 860°C (75%)	1200 to 1300°F 650 to 705°C	1725 to 1800°F 940 to 980°C	In air or salt at 1000 to 1100°F 540 to 595°C	350 to 400°F 175 to 205°C	Double temper at 900°F 480°C
1600 to 1650°F 870 to 900°C (45%)	1200 to 1300°F 650 to 705°C	1800 to 1875°F 980 to 1025°C	In air or salt at 1000 to 1100°F 540 to 595°C	350 to 400°F 175 to 205°C	Double temper at 900°F 480°C
1600 to 1650°F 870 to 900°C (45%)	1200 to 1300°F 650 to 705°C	1775 to 1850°F 970 to 1010°C	In air For sections greater than 1-1/2" quench in oil	300 to 400°F 150 to 205°C	800 to 900°F 425 to 480°C

Tempering Curves

