

GENERAL INFORMATION & APPLICATION	Ni – Cr – Mo steel characterized by high level hardenability and toughness. Suitable for the fabrication of tools exposed to repeated impacts and strong pressure in service. Treated for maximum hardness, it can also be used to construct cold work dies for cutlery, jewelry and plastics. anvils for hammers, rams and pile drivers dies and punches for horizontal forging machines rolls for hot work bending machines. It is advisable to use the blocks for dies treated at various hardness limits according to the etching depth complying with the indications given below.					
COMPARABLE STANDARDS	AISI/SAE	DIN	W.Nr.	AFNOR	JIS	GB
	-	X45NiCrMo4	1.2767	(Y35NCD16)	-	-
CHEMICAL ANALYSIS (%)	C 0.40~0.50	Mn 0.15~0.45	Si 0.10~0.40	Ni 3.80~4.30	Cr 1.20~1.50	Mo 0.15~0.35
HEAT TREATMENT						
Isothermal annealing:						
<ul style="list-style-type: none"> - heat to 800°C and hold at temperature for 1/2 h to 1 h; - Furnace cooling to 610°C and hold at temperature for at least 30 hours; - cool by 10°C/h to 580°C - cooling in air. <p>Following isothermal annealing with sub-critical annealing, holding at temperature for 10~12 hours, maximum. Softening is obtained with HB<270</p>						
Stress relieving:						
To be carried out after machining before the final heat treatment.						
<ul style="list-style-type: none"> - Heating to 630°C,hold for 4~6 hours. - furnace cooling to 300~350°C; - cooling in air 						
Hardening:						
<ul style="list-style-type: none"> - Initial preheating to 350~450°C; - second preheating to 650~750°C; - heat to hardening temperature 850~880°C and hold at temperature; - according to the shape and dimensions of the tool, cooling in still or forced air, possibly, in oil or in salt bath at 450~500°C; <p>in the latter case, as soon as the temperature of the tool is even, continue cooling in air.</p> <p>Quenched hardness: 54~57 HRC</p>						
Tempering:						
In the range 550~630°C for 4~6 hours according to hardness required, the dimensions of the Parts and perating conditions, cooling in still air. Before tempering, the parts must be preheated to 200~300°C						

Quenching and Tempering Curve (only for reference):