DATA SHEET

PRESS-X®

~ASM 6F4 - W.Nr. 1.2777 - 21MoNi33-12

HOT WORK TOOL STEEL

Finkl Steel

TYPICAL APPLICATIONS

- Press Dies
- Upsetting and Punching Tools
- Extrusion Dies

GENERAL:

Delivery Condition:
Solution treated and Aged
Hardness Range:

Finkl Std.	BHN	HRC
T2	352-388	38-42

PRESS-X® is a precipitation hardening die steel designed to resist thermal shock and provide excellent wear resistance at elevated temperatures.

PRESS-X® performs best on presses and upsetting and punching machines where longer dwell times between the dies and the hot forging stock are usual. It is not recommended for impact forging equipment.

PRESS-X® is forged utilizing wide die techniques that result in improved properties throughout the steel.

PRESS-X® is 100% ultrasonically tested according to the most rigorous standards and is fully warranted.

Note: Provided technical data and information in this data sheet are typical values. Normal variations in chemistry, size and conditions of heat treatment may cause deviations from these values. We suggest that information be verified at time of enquiry or order. For additional data or metallurgical assistance, please contact us.

®Finkl Steel Trademark

Typical Chemical Analysis - % weight

C	Mn	Si	Ni	Cr	Mo	V
0.20	0.70	0.25	3.15	0.15	3.35	0.08

A distinct advantage of **PRESS-X®** is the ability to increase its "as-quenched" hardness by the application of heat either through a tempering treatment or from contact with the hot metal being worked. This process takes place through precipitation strengthening and produces excellent resistance to abrasion at hot-working temperatures. While sustained high temperatures typically soften a conventional die steel, **PRESS-X®** hardens to approximately 461 Brinell (48 HRC).

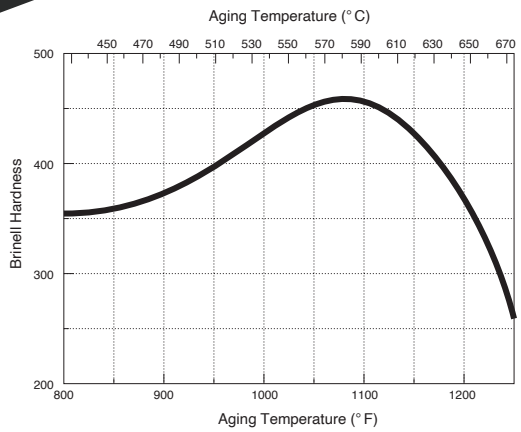
A remarkable feature of **PRESS-X®** is that hardness levels beyond typical commercial machinability limits can be obtained from a prehardened and machined die block by a simple aging operation (950˚F to 1050˚F) without the hazards of cracking, scaling, decarburization, distortion and warpage that usually accompany the hardening of high alloy steels.

PRESS-X® is able to be water cooled (even flooded) in service without the risks that usually come from such a practice on ordinary hot work die steels.

These advantages make **PRESS-X®** an efficient and high performing hot work die steel.

DATA SHEET

HOT WORK TOOL STEEL
PRESS-X®



Effect of Aging Temperature on Hardness

Die Preheating

An important property of a die steel is its resistance to sudden fracture. The impact resistance of **PRESS-X®** is substantially increased in the 300-400°F range. Accordingly, it is strongly recommended that the dies be preheated to at least this temperature prior to use. This can be done without risk of reducing strength as **PRESS-X®** maintains remarkable strength at high temperatures.

Heat Treating PRESS-X®

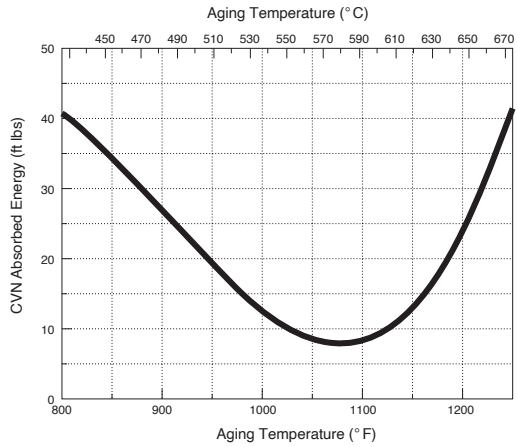
PRESS-X® is supplied in the solution treated and aged condition. In practice, it is usually advantageous to allow for the development of further hardness in service. If higher initial hardness is needed, the following aging practices are recommended:

For aging temperatures up to 1020˚F, hold at temperature for four hours for thicknesses up to and including one inch, increasing by one hour for each inch of increased thickness.

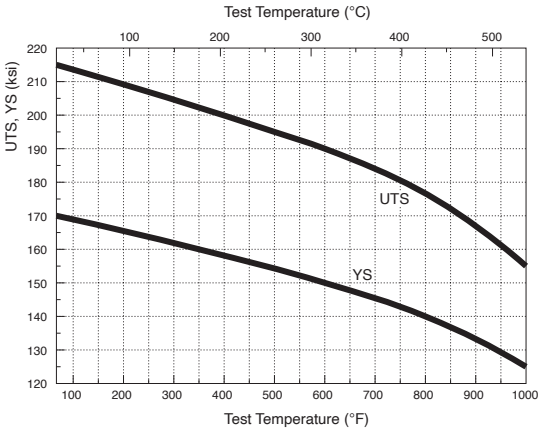
When aging temperatures are in the range of 1040˚F-1060˚F, precipitation hardening takes place rapidly, and the total time at temperature should not be more than five hours. Longer aging times may result in softening below the maximum attainable hardness.

Always air cool to room temperature from the aging temperature.

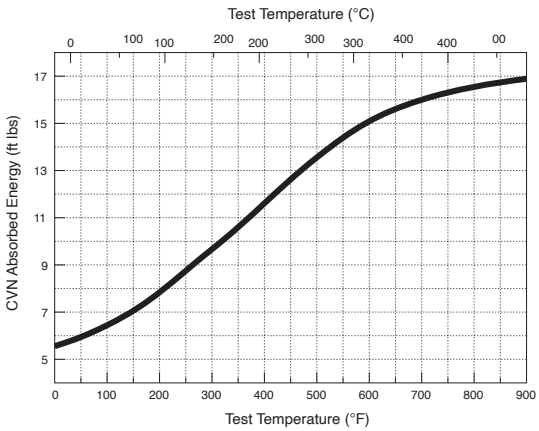
The maximum attainable hardness of approximately 48 HRC can be obtained at temperatures lower than 1040˚F-1060˚F provided the times at temperature are appreciably longer than indicated above. This practice must be approached carefully as excessive time at temperature can result in over-aging and loss of hardness. It is therefore recommended to allow the maximum hardness to develop through use.



CVN absorbed energy vs aging temperature (tested at 375°F)



Tensile Properties vs Temperature at Maximum Hardness



Ductile-to-Brittle Transition at Maximum Hardness

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