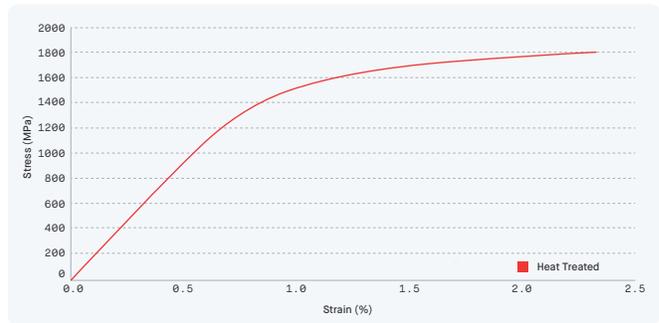


[Material Data Sheet]

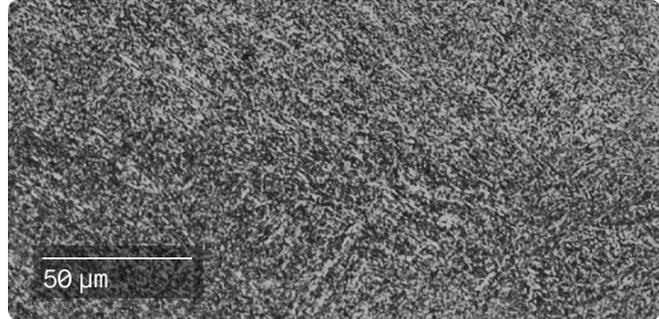
# S7

## Shock Resistant Tool Steel Alloy



### COMPOSITION %

Iron	Balance
C	0.45 – 0.55
Cr	3.00 – 3.50
Mn	0.20 – 0.80
Mo	1.30 – 1.80
Si	0.20 – 1.00
V	0.20 – 0.30
Cu	0.25 (max)
P	0.03 (max)
S	0.03 (max)



heat treated microstructure

### MECHANICAL PROPERTIES

	Standard	Production System™ After quench & temper	Production System™ After HIP & heat treatment
Ultimate tensile strength * (MPa)	ASTM E8	1,790 ± 50	2080 ± 22
0.2% Offset Yield Strength * (MPa)	ASTM E8	1,540 ± 35	1575 ± 67
Elongation at break (%)	ASTM E8	2.30 ± 0.75	7.7 ± 1
Young's modulus (GPa)	ASTM E8	185	185
Hardness (HRC)	ASTM E18	51 ± 2	53.7 ± 2
Charpy impact strength ** (J)	ASTM E23	5.5	9.5
Density	g/cm³	7.5	7.8
Surface finish *** (μm Ra)	ISO 4287	3 – 8	3 – 8

### ATTRIBUTES & APPLICATIONS

Excellent strength, hardness, and shock resistance at high temperature

Diversified mechanical properties through changes in heat treatment parameters

High impact strength components requiring wear resistance

Industrial hand tools, oil and gas components, military, and defense applications

Industrial pumps, gerotor pumps, gas engine components

Cutting tools, clamping dies, tooling

### OTHER STANDARD DESIGNATIONS

ASTM A681

DIN 1.2355

50CrMoV13-15

\* YS & UTS properties noted represent mean values across Xy orientation.

\*\* Charpy impact specimens used were V-notched 10 x 10 mm.

\*\*\* Surface roughness measured in Z direction after sintering & sand blasting.