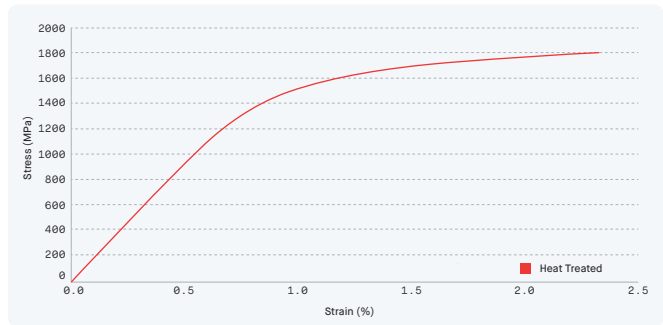


[Material Data Sheet]

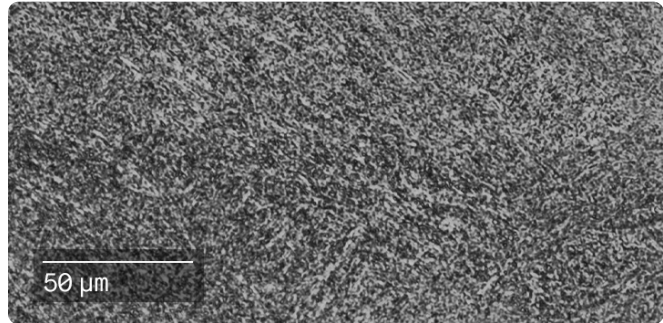
S7

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.