

S1 toolsteel is a shock resisting tool steel with very good toughness, is dimensionally stable, and impact resistant, with high hardening capacity. S1 is a shock-resistant, oil-hardening steel with good toughness, dimensional stability, and high hardening capacity.

STANDARDS •

- » USA: AISI S1
- » Germany: 1.2550
- » France: AFNOR 55 WC20
- » China: UNI 58 WCr 9 KU

CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	Mo	V	W	Cu	P	S
Min	0.40	1.00	0.15	0.10	--	0.15	1.50	--	--	--
Typical	0.45	1.40	0.17	0.25		0.22	2.25			
Max	0.55	1.80	1.20	0.40	0.50	0.30	3.00	0.25	0.035	0.035

APPLICATIONS •

- » Cold shear knives
- » Projector pins
- » Coining tools
- » Heavy duty Punches
- » Pneumatic hammers and chisels

FORM SUPPLIED •

- » Round bar
- » Flat Bar
- » Hexagonal bars
- » Plates
- » Square Block

Available surface conditions : hot rolled, ground, peeled, turned, drawn, cold rolled

HEAT TREATMENT •

- **Forging:** S1 tool steels are uniformly preheated at 1000°C (1832°F). These steels are then forged at temperatures ranging from 800 to 1000°C (1472 to 1832°F). This process is followed by cooling in a furnace to avoid stress.
- **Annealing:** is carried out in S1 tool steels by uniformly heating the steels to 770°C (1418°F) followed by equalization. These steels are then cooled in the furnace.
- **Stress Relieving:** S1 tool steels are heated up to 700°C (1292°F) before hardening, equalized, and then slowly cooled in order to remove stresses during heavy machining operations.

- **Hardening:** S1 tool steels are preheated to 650°C (1202°F) and soaked. They are then continuously heated to the final temperature that ranges from 900 to 950°C (1652 to 1742°F). Finally, the steels are quenched in oil.
- **Martempering:** performed in the case of S1 tool steels as an alternative procedure for hardening. This is carried out in a salt bath equipment.
- **Tempering:** S1 tool steels are tempered by uniformly heating the steels at the preferred tempering temperature followed by holding for an hour.

Tool	Hardening	Tempering
single edge cutting tools	1220 °C	550-570°C
multi edge cutting tools	1180-1220 °C	550-570 °C
cold work tools	1050-1150 °C	550-570 °C

PROCESSING . _____

S1 can be worked as follows :

- » Machining(grinding,turning,milling)
- » Polishing
- » Hot forming
- » Electrical discharge machining
- » Welding(special procedure incl. pre-heating & filler materials of base material composition)

GRINDING. _____

During Grinding, local heating of the surface, which can alter the temper, must be avoided. Grinding wheel manufacturers can provide advise on the choice of grinding wheels.

SURFACE TREATMENT . _____

The Steel Grade is a perfect substrate material for PVD coating. If nitriding is requested, a small diffusion zone is recommended but avoid compound and oxidized layers.

DELIVERY HARDNESS . _____

- » Typical soft annealed hardness is 229 HB
- » Cold drawn and cold rolled material is typically 10-40 HB harder

SIZES AVAILABLE . _____



ROUND	Starting From	Upto
DIAMETER	8 mm	500 mm
LENGTH	2000 mm	6000 mm

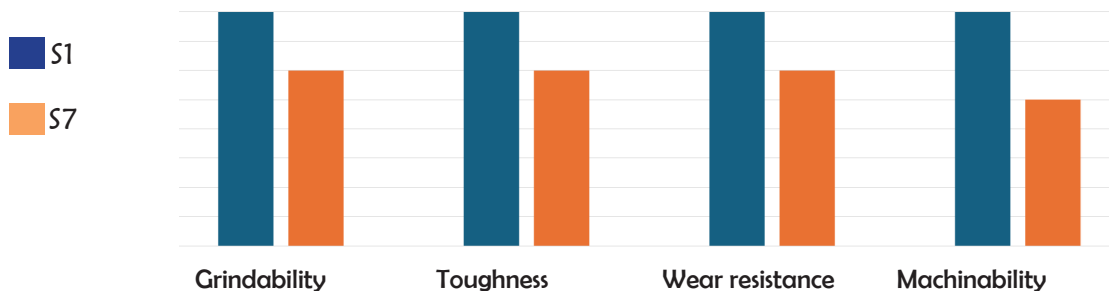


SQUARE BAR	Starting From	Upto
SIZE	8x8 mm	250x250 mm



FLAT	Starting From	Upto
THICKNESS	4 mm	205 mm
WIDTH	20 mm	400 mm

COMPARATIVE PROPERTIES . _____



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