

S7 tool steel has exceptional impact properties plus the highest hardenability of shock resisting grades of tool steel. It also possesses good softening resistance at high temperatures which gives it hot work capabilities. Because of its unusual combination of properties, S7 is suitable for a wide range of tool and die applications. It is used for hot and cold shock applications, medium hot-work dies and medium-run cold work tools and dies.

STANDARDS •

- » USA: AISI S7
- » Germany: 1.2357
- » Europe: 50CrMoV13-15

CHEMICAL COMPOSITION •

	C	Cr	Si	Mn	Mo	V	P	S
Min	0.40	3.00	0.20	0.20	1.30	0.15	--	--
Typical	0.48	3.25	0.60	0.55		0.25		
Max	0.55	3.50	1.00	0.90	1.80	0.35	0.035	0.035

APPLICATIONS •

- » Shear blades
- » Bending Dies
- » Mandrels
- » Collets
- » Leaf springs
- » Pipe cutters
- » Punches
- » Plastic moulds

FORM SUPPLIED •

- » Round bar
- » Drill round
- » Rectangular bars
- » Plates
- » Square Block

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

HEAT TREATMENT •

- **Annealing** : Anneal in a protective atmosphere. Heat rapidly to 1500 to 1550°F and hold at that temperature for one and one-half hours for each inch of greatest thickness. To obtain best machining properties, cool slowly to 1000°F, and then air-cool. This annealing procedure should produce a hardness of Brinell 197 max.
- **Stress Relief** : S7 steel Material: When desirable to relieve the strains of machining, heat slowly to 1050°-1250°F, allow to equalize, then cool in air.
- **Hardening**: Preheat: Warm steel S7 slightly before charging into the preheat furnace 1200°-1300°F, prior to hardening.

- **Harden**: 1750°F. Quench S7 tool steel in air if cross section is 2-1/2" or smaller; sections 2-1/2" to 6" should be oil quenched to black (1000°F) followed by air cooling to 150°F. Larger cross sections of S7 steel should be oil quenched to 150°F.
- **Quench**: Quench in still air or dry air blast.
- **Temper**: Tool steel S7 is normally tempered one hour per inch of section thickness to desired heating rate of 2 hours per inch. Cool in air to room temperature between the two tempers. The tempering temperature varies according to the intended use. Suggested: For cold-working and similar applications, the recommend 400°-500°F. Hot working applications: apply a tempering temperature of 900°-1000°F. Never temper at less than 400°F.

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 . _____

S7 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 220 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

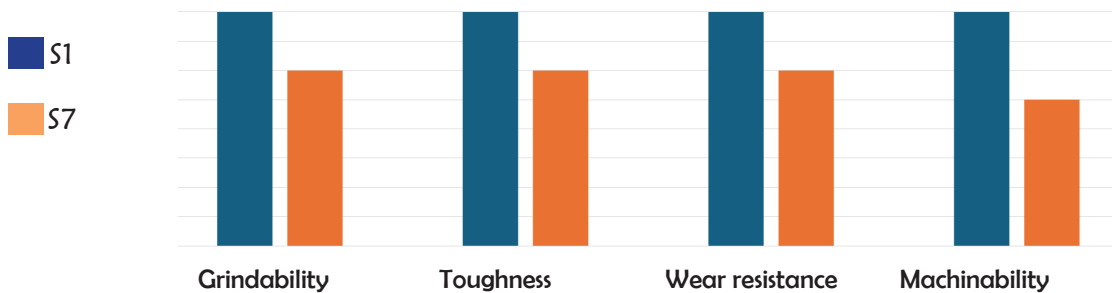


SQUARE BAR	Starting From	Upto
SIZE	8x8 mm	250x250 mm



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

COMPARATIVE PROPERTIES . _____



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