S1 Tool Steel

Quality S1 tool steel cut and delivered straight to your tool room, whatever size you need.

S1 tool steel stockholders and suppliers, delivering to the whole of the UK.

West Yorkshire Steel are stockholders and suppliers of S1 tool steel round bar. S1 is an alloy shock-resisting tool steel for both hot and cold work applications. The tungsten content of this tool steel grade confers fatigue resistance, the chromium content gives depth of hardness and resistance to abrasion. S1 tool steel is suitable for cold work tools subject to heavy shock and uneven loading; for example, press tools used for punching heavy gauge material, shear blades, nut blanking tools, perforating and piercing punches. This steel is also used with great success for chisels and punches required for heavy work on hard and tough materials. S1 tool steel is resistant to heat checking. It is suitable for hot work applications where high fatigue strength in combination with medium hot hardness is desirable. Tools made from this tool steel may be water cooled in service with little risk of cracking.

Popular tool steel grades we supply

O1 | D2 | D3 | O2 | D6 | A2 | S1 | H13 | P20 | P20S | 420 | 1.2083 | 2767 | M2 | M42 | Ground Flat Stock 1.1730

Form of Supply

West Yorkshire Steel are stockholders and suppliers of round bar. Diameters in S1 can be sawn to your required lengths as one offs or multiple cut pieces. Ground tool steel bar can be supplied, providing a quality precision finished bar to your required tolerances.

Contact our experienced sales team who will assist you with your enquiry.

- Diameter

Applications

Typical hot work applications for S1 tool steel include mandrel bars for drawing steel tubes. Medium temperature applications include swaging, forming and gripper dies, also punching, piercing and trimming dies. Other applications include shear blades working at medium temperature including flying shear blades.

Typical Analysis

Carbon	0.50%	Chromium	1.00%
Tungsten	2.00%	Silicon	0.70%
Vanadium	0.20%		

Forging

Heat carefully to 1000-1050°C and forge with light rapid blows. Reheat when temperature falls below 900°C if further work remains to be done. After forging, cool slowly, preferably in a furnace.

Annealing

Heat the S1 tool steel component slowly and uniformly to 800-810°C. Soak thoroughly for two to three hours and cool slowly in the furnace to room temperature.

Stress Relieving

For applications where distortion must be at a minimum or where the machining operations have been severe, we recommend stress relieving just before the tools are finish machined in order to relieve machining strains. Heat slowly to 700°C and allow to cool in the air.

Hardening

Pre heat at 650°C followed by rapid increase of temperature to the hardening temperature of 900-950°C. Quench in oil.

Tempering

Heat slowly to the required tempering temperature, soak thoroughly for two hours per 25mm section and allow to cool in still air. For hot work applications, a minimum tempering temperature of 550°C should be used.

Temperature °C	150	200	250	350	400
Hardness HRc	58-56	56-54	55-53	53-51	52-49

Heat Treatment

Heat treatment temperatures, including rate of heating, cooling and soaking times will vary due to factors such as the shape and size of each S1 steel component. Other considerations during the heat treatment process include the type of furnace, quenching medium and work piece transfer facilities. Please consult your heat treatment provider for full guidance on heat treatment of S1 tool steel.

Quality Assured Supply

S1 tool steel is supplied in accordance with our ISO 9001:2015 registration.