

X40CrMoV5-1 Steel

X40CrMoV5-1 steel suppliers, delivering to the whole of the UK. West Yorkshire Steel are suppliers of this steel grade in diameters and flat cut to your requirements. Combining very good red-hardness with toughness it is suitable for a wide variety of applications

We welcome export enquiries for tool steel. Contact our sales office and consult our [shipping policy](#) for further details.

Form of Supply

West Yorkshire Steel are stockholders and suppliers of fully annealed round and flat which can be sawn to your required sizes as one offs or multiple cut pieces. Ground steel bar can be supplied, providing quality steel precision ground steel bar to close tolerances. It can also be produced as Ground Flat Stock / Gauge Plate, in standard and non standard sizes.

Contact our experienced sales team who will assist you with your X40CrMoV5-1 steel enquiry.

- Plate
- Flat
- Diameter

Applications

X40CrMoV5-1 applications include bolsters, die cases, die holders, shear blades for hot work and hot swaging dies.

Analysis

Carbon	0.35-0.42%	Chromium	4.80-5.50%
Manganese	0.25-0.50%	Molybdenum	1.20-1.50%
Sulphur	0.02% max	Silicon	0.80-1.20%
Phosphorous	0.03% max	Vanadium	0.85-1.15%

Forging

Preheat the steel slowly to 750°C then increase more rapidly to 1050-1100°C. Do not forge below 850°C. It is essential to cool slowly after forging.

Annealing

As this specification is supplied in the annealed and machineable condition re-annealing will only be necessary if the steel has been forged or hardened. Soak thoroughly and uniformly at 840-860°C before furnace cooling at a maximum rate of 20°C per hour down to 600°C , then cool in air.

Stress Relieving

If tools made from X40CrMoV5-1 steel are heavily machined, the relief of internal strains is advisable before hardening to minimise the possibility of distortion. Stress relieving should be done after rough machining. To stress relieve, heat the component carefully to 700°C and then allow a good soaking period (two hours per 25mm of section). Cool in a furnace or in air.

Hardening

Preheat the component to 780-820°C. Soak thoroughly, then increase rapidly to a hardening temperature of 1000-1030°C. When the component has attained this temperature, soak for approximately 20 to 30 minutes. Cool in air. Larger sections may be quenched in oil. X40CrMoV5-1 steel may be vacuum hardened or pack hardened, tools should be tempered once they become hand-warm.

Tempering

Heat thoroughly to the required temperature allowing a soaking time of two hours per 25mm section. Withdraw the steel from the furnace and allow to air cool. A second tempering is strongly advised, cool to room temperature between tempers. The usual tempering range is 530-650°C.

Temperature [°C]	400	500	550	600	650
Hardness [HRc]	54	56	54	49	47

Nitriding

X40CrMoV5-1 can be nitrided to give a hard surface case, with the steel then very resistant to wear and erosion. It also increases resistance to corrosion. Nitriding in ammoniac gas at a temperature of 525°C will give a surface

hardness about 1000 to 1250HV. Before nitriding the component should be hardened and tempered at approximately 50°C above the nitriding temperature.

Temperature	Time	Approx. Depth of Case
525°C	10 hours	0.125mm
525°C	20 hours	0.180mm
525°C	40 hours	0.250mm
525°C	60 hours	0.300mm

Heat Treatment

Hardening temperatures, including rate of heating, cooling and soaking times can vary due to factors such as the shape and size of each component. Other considerations include the type of furnace, quenching medium and work piece transfer facilities. Please consult a heat treatment specialist for full guidance.

Final Grinding

Select the right grade of wheel in consultation with a grinding wheel manufacturer and ensure the grinding wheel is in good condition. Wet grinding is a preferable option using a copious supply of coolant. If dry grinding is resorted to then use a soft wheel.

Quality Assured Supply

X40CrMoV5-1 steel is supplied in accordance with our ISO 9001:2008 registration.