

## A2 Tool Steel

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**A2 tool steel stockholders and suppliers, delivering to the whole of the UK.** West Yorkshire Steel are suppliers of A2 steel in round bar, flat and cut plate (to your required sizes). An air hardening tool steel which, after heat treatment, offers a high abrasion resistance coupled with toughness. Due to its lower chromium content, the wear resistant properties of A2 are not as great as those to be found in high carbon, high chromium steels such as [D3](#) and [D2](#) but it is much easier to machine than the latter specifications and can be ground to a cutting edge which is less liable to crumble in service. Where tools of a large mass are being produced A2 tool steel, being an air hardening quality, is more suitable than the oil or water hardening tool steels.

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

### Related Specifications

AISI ASTM A681 DIN 17350 BS EN ISO 4957

### Alternative tool steel grades we supply

[O1](#) | [D2](#) | [D3](#) | [O2](#) | [D6](#) | [S1](#) | [H13](#) | [P20](#) | [P20S](#) | [420](#) | [1.2083](#) | [2767](#) | [M2](#) | [M42](#) | [1.1730](#)

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## Form of Supply

Supplied as round bar and plate; flats and diameters can be sawn cut to your required sizes. Ground steel bar can be supplied, providing a high quality precision finish to your required tolerances. A2 tool steel 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 A2 tool steel enquiry.

- Flat
  - Diameter
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## Applications

A2 steel offers goods results when used for cold forging dies, coining dies, cold heading dies, shear blades, knurling tools and as cutting knives for paper, wood, fibre and resin-bonded material.

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## Typical Analysis

Carbon	1.00%	Manganese	0.50%
Chromium	5.00%	Molybdenum	1.00%
Vanadium	0.20%		

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## Ground Flat Stock

Precision ground flat stock / gauge plate can be produced using A2 tool steel. Subject to size suitability and availability pieces can be produced in approximately 2 to 3 weeks. Standard and non-standard sizes are available.

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## Forging

Preheat at 650-680°C before raising the temperature to 1050-1100°C and soak until uniformly heated. Initial hammer blows should be light due to the comparatively high hot strength of this steel. The forging temperature must be maintained above 1000°C until the metal begins to yield. Final forging should not be done below 900°C. Slow cooling after forging is essential to avoid the possibility of cracking.

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## Annealing

A2 steel is supplied in the annealed condition. Re-annealing will only be necessary if the toolmaker has forged the steel, or if a hardened tool has to be re-machined or re-hardened. Heat slowly to 850-870°C. After a minimum of two hours at this temperature the furnace temperature should be lowered to 730-750°C and held there for four to six hours. Allow to cool very slowly in the furnace to 600°C or below before removing the steel to cool in air.

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## Stress Relieving

When heavy machining and-or grinding of A2 tool steel has been carried out, it is advisable to stress relieve in order to minimise the danger of distortion or cracking during the subsequent heat treatment. To stress-relieve, heat the tools slowly to 670-700°C, soak for a minimum of two hours per 25mm of section and allow to cool down in the furnace. The tools can then be finish machined, leaving on an allowance for final grinding after hardening and tempering.

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## Hardening

Pre-heat slowly to 790-820°C and thoroughly soak at this temperature. Continue heating to the hardening temperature of 950-980°C. Allow sufficient time for the A2 tool steel component to become evenly heated through. Withdraw from the furnace and then either air cool or oil quench. The steel may be protected against scaling and decarburisation by heating in a reducing atmosphere furnace, heating in a neutral salt bath, or by pack hardening. Temper as soon as the tool is hand warm.

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## Tempering

Temper with the least possible delay after hardening. Heat slowly to the required tempering temperature. Soak for one hour per 25mm of section (one hour minimum) and allow to cool in air. Double tempering is recommended, the second temper being a repetition of the first.

<b>Temperature [°C]</b>	150	200	250	300	350	400
<b>Hardness [HRc]</b>	62-61	61-60	60-59	59-58	58-57	58-57

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## Final Grinding

When grinding hardened A2 tool steel select the correct grade of wheel in consultation with the grinding wheel manufacturer. Keep the grinding wheel in good condition by means of a suitable dressing tool. Wet grinding is preferable using a copious supply of coolant. If dry grinding is resorted to, use a very soft wheel.

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## 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 A2 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 tool steels.

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## Quality Assured Supply

A2 steel is supplied in accordance with our ISO 9001:2015 registration.