

## P20S P20+S Tool Steel

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**P20S P20+S tool steel suppliers and stockholders delivering to the whole of the UK.** West Yorkshire Steel are stockholders and suppliers of P20S steel round bar, flat bar and plate. P20+S is a high tensile alloy tool steel grade supplied in the hardened and tempered condition. With its higher sulphur content it offer better machinability than P20 plastic mould tool steel grade.

### Related Specifications

AISI ASTM A681 DIN 17350 BS EN ISO 4957

### Alternative tool steel grades we supply

[O1](#) | [D2](#) | [D3](#) | [O2](#) | [D6](#) | [A2](#) | [S1](#) | [H13](#) | [P20](#) | [420](#) | [1.2083](#) | [2767](#) | [M2](#) | [M42](#) | [1.1730](#)

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### Form of Supply

West Yorkshire Steel are stockists and suppliers of plate, round bar and flat bar. Rectangular pieces in grade P20S can be sawn from flat bar or block to your specific sizes. Diameters can be sawn to your required lengths as one offs or multiple cut pieces. Centreless ground tool steel bar can be supplied, providing a quality precision ground bar to tight tolerances.

Contact our experienced sales team who will assist you with your P20S tool steel enquiry.

- Plate
  - Flat
  - Diameter
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### Applications

Tool steel P20+S is ideally suited for the production of moulds where improved machinability is required. Typical applications include bolsters and injection moulds, die holders and zinc die casting dies. P20S is a versatile plastic mould tool steel with high tensile characteristics suitable for many other applications such as shafts and wear strips.

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## Typical Analysis

Carbon	0.35-0.45%	Chromium	1.80-2.00%
Manganese	1.40-1.60%	Molybdenum	0.15-0.25%
Sulphur	0.05-0.10%	Silicon	0.30-0.50%
Phosphorous	0.03% max		

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## Forging

Heat the P20S component slowly, allow sufficient time for the steel to become heated through. Begin to forge at 1050°C. Do not forge below 930°C reheating if necessary. After forging, cool very slowly.

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## Stress Relieving

When dies made from P20S are heavily machined, we recommend stabilising the steel just before finish machining in order to relieve machining strains. Heat up to 460-500°C, soak well and cool in air.

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## Annealing

Heat uniformly to 710-740°C. Soak well, cool slowly in the furnace.

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## Hardening

Heat uniformly to 830-870°C until heated through. Quench in oil.

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## Tempering

When tempering P20S heat the steel uniformly, soaking at the tempering temperature for at least one hour per 25mm of section. Allow to cool in still air.

<b>Temperature [°C]</b>	100	200	300	400	500	600
<b>Hardness [HRc]</b>	51	50	48	46	42	36
<b>Tensile [N/mm<sup>2</sup>]</b>	1730	1670	1570	1480	1330	1140

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## Nitriding

Tools machined from P20S pre-hardened can be nitrided to give a wear resistant surface case of approximately 60 Rockwell C hardness with a case depth of .35mm to 0.5mm. Nitriding also increases the corrosion resistance of P20S. After nitriding at 525°C in ammonia gas the surface hardness of the tool will be approximately 650HV.

Temperature	Time	Approx. Depth of Case
525°C	20 hours	0.30mm
525°C	40 hours	0.35mm
525°C	60 hours	0.50mm

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## Carbursing / Case Hardening

Tools produced from tool steel P20+S may be case hardened, which can achieve a surface hardness of between 55 to 59 Rockwell C.

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## Flame / Induction Hardening

Induction or flame hardening will achieve a hardness of 50 to 55HRc. It is preferable to air cool, though smaller components may require forced cooling. Temper immediately after hardening.

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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 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 steel P20+S.

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## Quality Assured Supply

P20+S tool steel is supplied in accordance with our ISO 9001:2015 registration.