



## D3 COLD WORK TOOL STEEL

TYPICAL ANALYSIS		BS4659	BD3
C	Cr	ASTM	D3
2.10	12.50	Werkstoff	1.2080

D3 is an oil hardening, high carbon, chromium steel extremely resistant to abrasive wear. It possesses excellent dimensional stability during hardening. The high abrasive resistance developed after heat treatment requires special care during grinding.

### APPLICATIONS

Typical uses include drawing dies, gauges, brick mould liners, lamination dies and dies for moulding abrasive powders and corrosive plastics.

### ANNEALING

To prevent excessive scaling or decarburisation pack in spent carburising mixture or other similar inert media in a sealed container. Heat to 850°C / 880°C, soak thoroughly at temperature then cool at a range not faster than 25°C per hour to 650°C. The parts may then be air cooled. A maximum hardness of 248 HB should be obtained.

### STRESS RELIEVING

Heat to 650°C / 700°C . Hold for 2-4 hours and furnace cool.

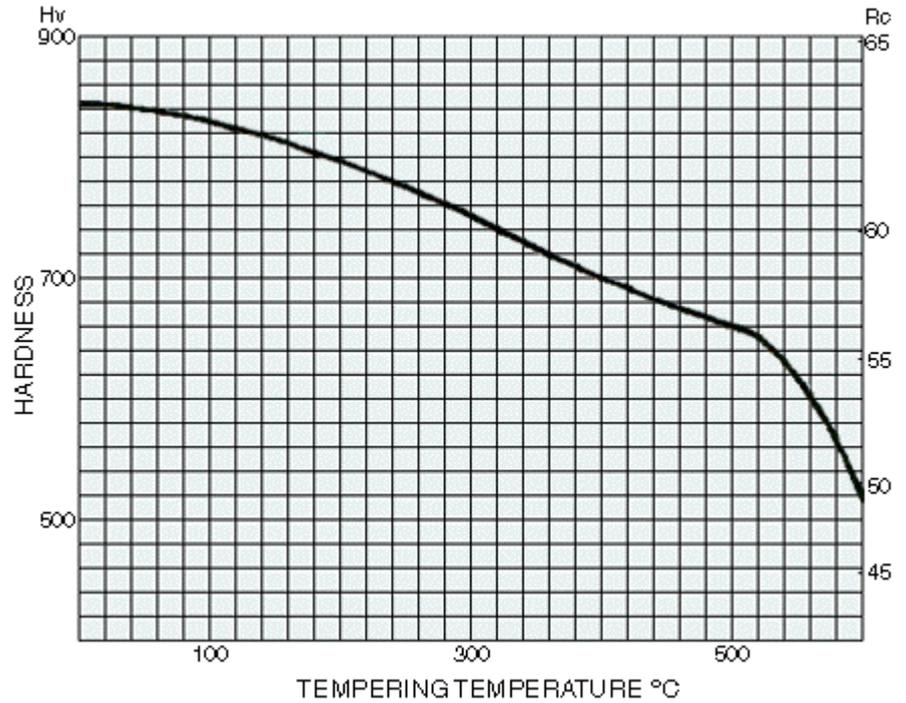
### HARDENING

Before heat treatment, sufficient machining should be carried out to remove surface decarburisation.

Preheat thoroughly to 800°C / 850°C and then raise more rapidly to 950°C / 970°C in a controlled atmosphere furnace or, preferably, a neutral salt bath. A useful alternative is box hardening using spent charcoal placed away from the working surface. The high chromium content of this steel makes reactions sluggish, therefore adequate soaking times must be allowed. Quench in oil. Thin sections may be air cooled from 1000°C / 1020°C.

# TEMPERING

Tools should be tempered immediately after completion of the quench. Heat slowly to within the 150°C / 450°C range holding at temperature for a minimum of one hour. The tempering curve given indicates typical hardness values obtained on oil quenching from 970°C and single tempering.



# ISOTHERMAL TRANSFORMATION

The diagram illustrates the time required for transformation of austenite to commence and it may be usefully employed in determining the correct temperatures and holding times for interrupted quenching treatments.

(Austenitised at 975°C)

