DC53

Typical Analysis

C	0.95	Cr	8.00
Mo	2.00	V	0.30
Si	1.00	Mn	0.40

Colour Code

Characteristics

- Higher hardness (62-63HRc) than D2 after heat treatment
- Twice the toughness of D2 with a superior wear resistance
- 20% higher fatigue strength than D2
- Smaller primary carbides than D2 protect the die from chipping and cracking
- Secondary refining process (DLF) reduces Impurities
- Machines and grinds up to 40% faster than D2
- Less risidual stress after wire EDMing
- The chart top right shows where DC53 properties lie compared with conventional tool steels and powder metallurgy tool steels

Stock

CARRS DC53 is stocked in a range of diameters and plate and cut to customers requirements

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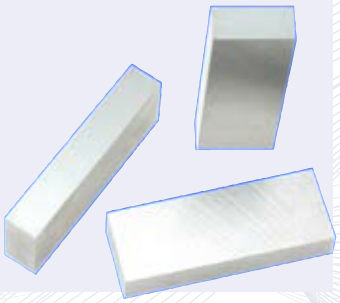
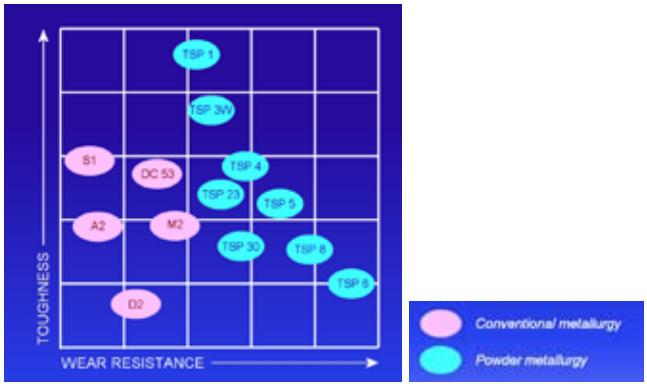
Rectangular sections from 25mm³ up to 430 X 430 X 150mm can be delivered fine milled on all six faces to - 0+0.1mm and with squareness guaranteed to 0.1mm/m.





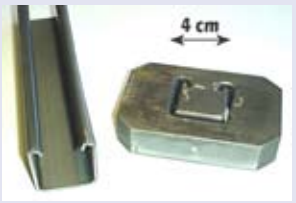
Typical Applications

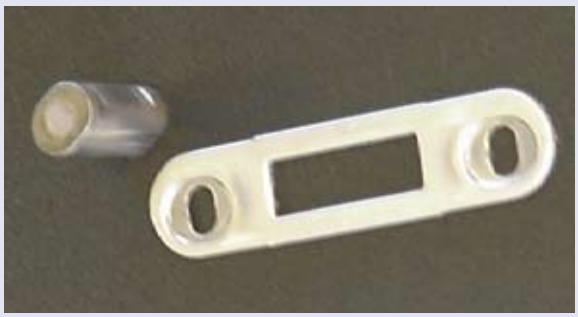
- Plastic Moulds
- Stepped punch and press-punching dies
- Concrete sprayer parts, rotor plates
- Swaging dies and backers
- Dies for cold forging
- Thread-rolling dies for heat-treated bolts
- Forming dies
- Stripper plates for lead fame blanking
- Gauges
- Screws for injection moulding machines

Case Studies

(More available on request)

Shearing mild steel rolled sections. The 12,000 operations before tool failure using D2 material increased to 30,000 using DC53





Punching operations.
This D2 compression punch was achieving only 2,000 operations before regrinding or failure. Changing to DC53 resulted in more than 25,000 operations before regrinding.

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HEAT TREATMENT

Welding

Lower minimum pre-and post - heating temperature than D2 reduces the incidence of weld cracking and simplifies welding. Low hardness decline in heat affected zone minimises any deterioration in performance.

Hardening Vacuum Furnace

Pre-heat to 300-400°C and then to 800-850°C allowing sufficient time to equalise. Raise to 1,020-1,040°C and allow soaking time according to the chart below:

Maximum Section (mm)	Soaking Time (mins)
100 and below	20-30 mins per25mm
Above 100	10-20 mins per 25mm

Quenching Vacuum Furnace

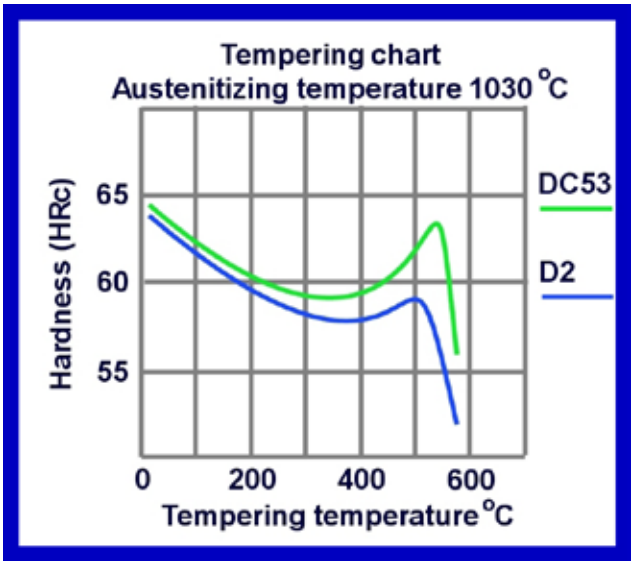
The high hardenability of this steele enables it to be satisfactorally quenched in a vacuum furnace.

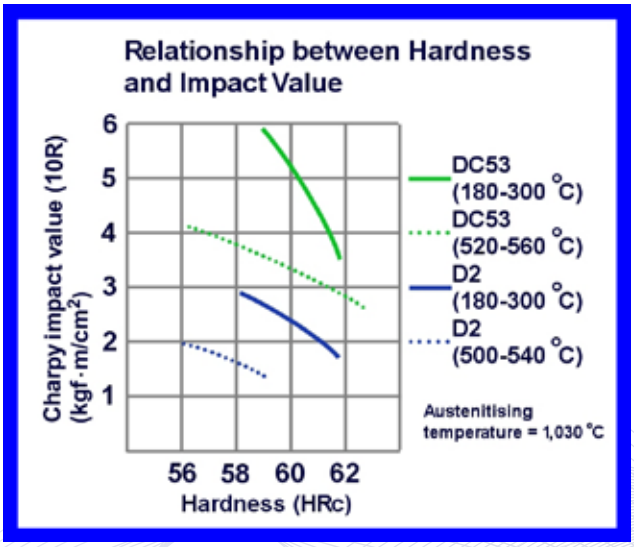
Surface Treatments

Surface treatments such as CVD, PVD, TD and Nitriding require the use of relatively high processing temperatures. While this can be a problem with standard D2, the higher through hardness of DC53 at elevated temperatures will allow these surface treatments to be used successfully.

Tempering

Double temper according to the hardness and toughness charts below. As with D2, a third temper at 400°C should be carried out to avoid any chance of any delayed grain growth and distortion. This is the preferred heat treatment for most applications as high hardness will be the primary consideration. Where maximum toughness is required, double temper between 200 and 300°C (depending on application). Note the material tempered at the lower temperature should not be subjected to subsequent high temperature processes such as PVD. For the fullest details of application related heat treatments, please ask for our detailed publication on the subject





Further information

Detailed information covering physical properties, welding and surface treatments are available, please ask.

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