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### 4140 Hard Chrome Plated Bar

4140 is a 1% Chromium - Molybdenum high tensile steel supplied in the hardened and tempered, cold drawn or turned, precision ground, polished, chrome plated and final polished condition, with a typical base metal tensile strength of 850 - 1000 Mpa, plus a typical hard chrome plated surface hardness of HV 1000 - 1150.

Characterised by an extremely smooth surface finish with excellent wear and corrosion resistance, coupled with a base material giving high strength and good impact properties, plus good machinability.

4140 hard chrome plated bar is used extensively by the hydraulic and pneumatic industries, and is employed by other industry sectors for a wide range of applications requiring higher strength.

Typical applications are: Agricultural Equipment, Hydraulic Cylinders, Hoists, Jacks and other Lifting equipment, Machine Tools, Mining and Earth Moving Equipment, Pumps, Valves, Waste Disposal Transport and Equipment etc.

Colour Code  Dark Green End Caps	<a href="#">Stocked Sizes</a>	Metric	20mm - 140 mm Dia
		Imperial	3/4" - 5" Dia

### Related Specifications

Australia	AS 1444 - 1996 4140
Germany	W.Nr 1.7223 41CrMo4 W.Nr 1.7225 42CrMo4
Great Britain	BS970 - Part 3 - 1991 709M40 BS970 - 1955 EN19A
Japan	JIS G 4105 SCM 440
USA	ASTM A29/A29M - 91 4140 SAE/AISI 4140 UNS G41400

Chemical Composition (Base Material)	Min. %	Max. %
Carbon	0.36	0.44
Silicon	0.10	0.40
Manganese	0.65	1.10
Chromium	0.75	1.20
Molybdenum	0.15	0.35
Phosphorous	0	0.04
Sulphur	0	0.04

### Typical (Base Metal) Mechanical Properties - As Supplied Condition

Manufacturing Process	Tensile Strength Mpa	Yield Strength Mpa	Elongation In 50mm %	Hardness Brinell HB
Turned	900	800	20	270

### Hard Chrome Plating

Typical Surface Hardness	HV 1000 - 1150
Typical Surface Smoothness	0.10 - 0.30 umRa (Microns)
Typical Surface Deposit*	0.025 - 0.050 mm (0.001") - (0.002")

\*Note: Can be supplied up to 0.125 mm against order, subject to minimum quantity requirements.

### Diameter and Straightness Tolerance

Diameter		Tolerance	
mm	inches	mm	inches
Up to 51mm Dia	Up to 2.0	+0.00	+0.00
		-0.025	-0.001
Over 51 - 102mm Dia	Over 2.0 - 4.0	+0.00	+0.00
		-0.050	-0.002
Over 102mm Dia	Over 4.0	+0.00	+0.00
		-0.075	-0.003
Straightness	Below 50mm 0.25mm/1000mm Over 50mm 0.30mm/1000mm		

### Typical Bar Lengths

Up to 18 mm Dia	2000mm - 3600mm
19.05 mm to 25 mm Dia	4000mm
Over 25 mm Dia	6000mm

Bar lengths are approximates only.  
NB. Bars have 100mm approx. unchromed surface at each end.

### Packaging

Supplied in cardboard tubes for protection.

### Machining

4140 hard chrome plated bar has very good machinability, similar to 4140 uncoated bar. Machining however should commence beneath the chrome plating, or at the unchromed surface at the end of the bar. To protect the polished chrome surface, soft materials such as copper, aluminium or mild steel should be used as clamping materials and any particles of hard chrome should be removed immediately to avoid scratching. Otherwise all machining operations may be carried out satisfactorily.

### Welding

Welding 4140 hard chrome bar in the hardened and tempered as supplied condition is not recommended and should be avoided if at all possible, as the mechanical properties will be altered within the weld heat affected zone. If however welding is really necessary the following procedure may be taken as a guide only..

### Welding Procedure

The cardboard tube protecting the chrome plating should first be removed from the heat affected area otherwise it can cause some corrosion of the plating due to fumes emitted.

Welding should always be carried out using low hydrogen electrodes.

Please consult your welding consumables supplier.

### Suggested pre-heat temperature

Section	°C
25 mm	370
50 mm	425
75 mm	460
150 mm +	510

### Post Welding

Maximum cooling rate 95 °C per hour down to 95 °C, followed by cooling in still air. NB. No draught. It is recommended that the weld area if possible is wrapped in a heat resistant blanket or buried in sand, dry lime etc.

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