

12L14 BRIGHT MILD STEEL

12L14 is a Re-Sulphurised, Re-Phosphorised Free Maching Steel. This is premium grade of free cutting steel is used by repetition engineers and general machining for a wide variety of applications. It has excellent machinability and is suitable for case hardening and electroplating.

Typical applications are: Brake hose ends, pulleys, disc brake pistons, wheel nuts and inserts, control linkages, gear box components (case hardened), domestic garbage bin axles, concrete anchors, padlock shackles, hydraulic fittings, vice jaws (case hardened)

Material: Magnetic in all conditions

Colour Code	Stocked Sizes	
 Purple (Bar End) Rose Pink (Band)	Rounds	6.35mm - 60mm
	Hexagons	10mm - 63.5mm
	Bar Finish	Peeled, Cold Drawn, Turned Turned & Polished, Centreless Ground

Related Specifications

Australia	AS 1443/ 12L14, AS 1443/D13*, AS1443/T13* <i>Mechanical Test</i>
Germany	DIN 95MnPb28, Werkstoff No. 1.0718
Great Britain	BS970 230M07 leaded, EN1A Leaded
Japan	JIS: SUM22L
USA	AISI /SAE 12L14 UNS G12144

Chemical Composition

	Min. %	Max. %
Carbon	0	0.15
Silicon	0	0.10
Manganese	0.80	1.20
Phosphorous	0.04	0.09
Sulphur	0.25	0.35
Lead	0.15	0.35

Typical Mechanical Properties - Cold Drawn and Turned and Polished Condition

Cold Drawn Size mm		up to 16mm	17 - 38mm	39 - 63mm	Turned & Polished (all sizes)
Tensile Strength Mpa	Min	480	430	400	370
	Max	760	690	630	520
Yield Strength Mpa	Min	350	330	290	230
	Max	590	550	500	310
Elongation in 50mm %	Min	7	8	9	17
Hardness HB	Min	142	120	115	105
	Max	225	205	185	155

Forging

Heat to 1300 °C maximum, hold until temperature is uniform throughout the section and commence forging. Do not forge below 950 °C
Finished forgings may be air cooled.

Heat Treatment

Annealing

Heat to 890 °C - 920 °C hold until temperature is uniform throughout the section, and cool in furnace.

Carburizing

Pack, salt or gas carburise at 900 °C holding for sufficient time to develop the required case depth and carbon content, followed by a suitable refining/hardening and tempering cycle to optimise case and core properties.

Core Refine

Slow cool from carburising temperature and re-heat to 880 °C - 900 °C, hold until temperature is uniform throughout the section and quench as required in oil, water.

Case Hardening

Following core refining, re-heat to 760 °C - 790 °C, hold until temperature is uniform throughout the section and quench in water. Temper immediately while still hand warm.

Tempering - After Carburising, Core Refining and Case Hardening

Re-heat to 120 °C - 230 °C, hold until temperature is uniform throughout the section, soak for 1 hour per 25 mm of section and cool in still air. NB. Tempering will improve the toughness of the case with only slight reduction in case hardness. It will also reduce its susceptibility to grinding cracks.

Normalizing

Heat to 900 °C - 940 °C hold until temperature is uniform throughout the section, soak for 10 - 15 minutes. Cool in still air.

Stress Relieving

Heat to 500 °C - 700 °C hold until temperature is uniform throughout the section, soak for 1 hour per 25mm of section, and cool in still air.

Notes on Heat Treatment

Heating temperatures, rate of heating, cooling and soaking times will vary due to factors such as work piece size/shape, also furnace type employed, quenching medium and work piece transfer facilities etc. Please consult your heat treater for best results.

Machining

12L14 is a premium free cutting steel grade suitable for all types of high production and repetition machining.

Welding

12L14 is not recommended for welding due to its lead content. It is a health hazard

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