VULCAN
Engineering Steels

1020 CARBON STEEL BAR

1020 is a low carbon mild steel. This bar is supplied in As Rolled black condition, with sizes over 250mm also supplied in forged and Rough Machined condition. 1020 combines excellent weldability, with good machinability and very good ductility.
Typical Applications are: General Engineering Parts and Components, Welded Structures etc. In carburised condition: Camshafts, Light Duty Gears, Gudgeon Pins, Ratchets, Spindles, Worm Gears etc.

Stocked Sizes	-	As Rolled Round	36 mm – 300 mm Ø
		Forged Rough Machined	250 mm – 530 mm Ø

Related Specifications		
Australia	AS 1442/1443 – 1992 1020	
Japan	JIS G4051 S20C	
USA	AISI 1020 ASTM A29 – 91 1020 SAE 1020 UNS G10200	
Chemical Composition*		
	Min. %	**Max %**
Carbon	0.18	0.23
Silicon	0.10	0.35
Manganese	0.30	0.60
Phosphorous		0.04
Sulphur		0.04

*Vulcan allow for a maximum Chromium content of 0.5%

Typical Mechanical Properties – As Rolled (For Guidance Only)	
Tensile Strength (Mpa)	360-560
Yield Strength (Mpa)	280-350
Elongation in 50mm (%)	36
Hardness (Brinell BHN)	110-170
Annealing	
Heat to 870-910 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.	
Normalizing	
Heat to 890- 940 Deg C. Hold until temperature is uniform through the section, soak for 10-15 minutes and allow to cool in still air.	
Stress Relieving	
Heat to 650-700 Deg C. Hold until temperature is uniform throughout the section, soak for 1 hour per 25mm of section, and cool in still air	

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1045 MEDIUM TENSILE CARBON STEEL BAR

1045 is a medium tensile carbon mild steel. This bar is supplied in As Rolled black condition, with sizes over 250mm also supplied in forged and Rough Machined condition. 1045 combines good strength and impact properties with good machinability with reasonable weldability.
1045 is used extensively across all industry sectors due to it's versatility and flame/induction hardening capabilities.
Typical applications include Axles, Bolts, Sprockets/Gears, Connecting Rods, Hydraulic Clamps, Rams, Pins, Rolls, Studs, Shafts Spindles etc.

Stocked Sizes	-	**Round** -	As Rolled Round	20 mm – 250 mm Ø
			Forged Rough Machined	250 mm – 750 mm Ø
		Square -	As Rolled Square	40 mm – 100 mm Sq

Related Specifications	
Australia	AS 1442/1443 – 1992 1045
Germany	C45 (W.Nr 1.0503) CK45 (W. Nr 1.1191)
Japan	JIS G4051 S45C
USA	AISI C1045 ASTM A29 – 91 1045 SAE 1045 UNS G10450

Chemical Composition*		
	Min. %	**Max %**
Carbon	0.43	0.50
Silicon	0.10	0.35
Manganese	0.60	0.90
Phosphorous		0.04
Sulphur		0.04

*Vulcan allow for a maximum Chromium content of 0.5%

Typical Mechanical Properties – As Rolled (For Guidance Only)	
Tensile Strength (Mpa)	570-700
Yield Strength (Mpa)	300-450
Elongation in 50mm (%)	14-30
Hardness (Brinell BHN)	170-210
Annealing	
Heat to 800-850 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.	
Normalizing	
Heat to 870- 920 Deg C. Hold until temperature is uniform through the section, soak for 10-15 minutes and allow to cool in still air.	
Stress Relieving	
Heat to 550-660 Deg C. Hold until temperature is uniform throughout the section, soak for 1 hour per 25mm of section, and cool in still air	