

Material Grade: **817M40**  
 Material Condition(s): **Untreated / Annealed / Quench and tempered**  
 Surface Finish: **As rolled / As forged / Bright drawn / Bright turned**

Associated Standard: **BS970**

Description:

A general purpose steel used for a wide range of engineering parts. It is capable of being heat treated to produce a wide range of tensile strengths combined with good ductility and resistance to shock. It has good hardenability, enabling it to be used for medium tensile strengths in fairly large sections, and possesses good resistance to wear. At low temperatures good impact values can also be obtained.

Bars are often supplied in the hardened and tempered condition with a tensile strength range of 850-1000 N/mm<sup>2</sup>. Material is readily machinable so that the components can be put into service without the cost of further treatment. Bars can also be supplied in the softened state which require hardening and tempering but give increased machinability.

Nickel-chromium-molybdenum steels benefit from a combinations of alloying elements. Nickel imparts toughness; chromium depth of hardness; molybdenum inhibits temper brittleness and each elements tends to reduce grain size.

Typical applications: Shafts, connection rod bolts, push rods, studs, pinion sleeves, mandrel bars for tube manufacturing, breech mechanism parts, high-duty engine connecting rods, high temperature bolts in oil refining and steam installations, various parts of machine tools such as spindle gears, power transmission gears, slide cams.

**1. STEELMAKING**

	<u>C</u>	<u>Si</u>	<u>Mn</u>	<u>S</u>	<u>P</u>	<u>Cr</u>	<u>Ni</u>	<u>Mo</u>
Min	0.36	0.10	0.45			1.00	1.30	0.20
Max	0.44	0.35	0.70	0.040	0.035	1.40	1.70	0.35

**2. TYPICAL MECHANICAL PROPERTIES**

Test type	Tensile and hardness test (at room temperature)						Impact test (KV)
	Yield (Re)	0.2 % proof	UTS (Rm)	Elong (A)	R of A (Z)	Hardness	Room Temp
Unit	N/mm <sup>2</sup>	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%	HB	J
Annealed	Min						
	Max					277	
Q + T + Drawn, condition 'T'	Min	700	850	9		248	50
	Max		1000			302	
Q + T to condition 'T'	Min	680	850	13		248	50
	Max		1000			302	
Q + T to condition 'U'	Min	755	925	12		269	42
	Max		1075			331	
Q + T to condition 'V'	Min	850	1000	12		293	42
	Max		1150			352	