

826M40 – 2.5% Ni-Cr-Mo Steel

Related Specifications

BS970 – 1955 EN26
DIN 40NiMoCr10 4
W.Nr. 1.6745

826M40 is a 2.5% Ni-Cr-Mo high hardenability, high tensile strength steel.

It is generally supplied in the Hardened and Tempered condition in the tensile range of 1000 – 1150Mpa (V Condition) but can be heat treated to 925 – 1550Mpa dependent on section size (U – Z Condition). It could also be supplied in the annealed condition suitable for pre-heat treatment machining.

This grade is very popular and widely used in most industry sectors where high strength and moderate impact properties are essential in fairly large components.

Typical applications include axles, shafts, rolls, die holders, rams etc.

Pre-hardened and tempered 826M40 can be further surface hardened by flame or induction hardening or nitriding.

Typical Chemical composition

Carbon	0.40%
Silicon	0.25%
Manganese	0.60%
Phosphorous	<0.040%
Sulphur	<0.040%
Chromium	0.65%
Molybdenum	0.55%
Nickel	2.55%

Mechanical Property Requirements – BS970 Part 3 1991

Condition	Ruling Section	Tensile Strength Mpa	Yield (0.2%) MpA	Elongation %	Izod FTLBS	Charpy J	Hardness HB
U	250	925/1075	725	12	25	28	269/331
U	150	925/1075	740	12	35	42	269/331
V	250	1000/1150	820	12	25	28	293/352
V	150	1000/1150	835	12	35	42	283/352
W	250	1075/1225	910	11	20	22	311/375
W	150	1075/1225	925	11	30	35	311/375
X	150	1150/1300	1005	10	25	28	341/401
Y	150	1225/1375	1080	10	25	28	363/429
Z	100	1550 Min	1125	7	10	11	444 Min

Forging

Forging Temperature for this material should be 850 – 1200oC

Soak times should be kept to a minimum to avoid heavy scaling, but sufficient time should be given to allow centre to achieve furnace temperature.

After forging pieces should be allowed to cool in still air.

Heat Treatment

Annealing - Heat to 790 - 840°C for a time commensurate with ruling section and furnace cool.

Hardening - Heat to 820 - 850°C for a time commensurate with ruling section and quench in Oil, Water or Polymer.

Note: If water quench is to be used, although not recommended, care must be taken to ensure that all sharp corners are removed prior to heat treatment.

Tempering should be done immediately whilst the material is still hand warm

Tempering - Re-heat to 450 - 660°C as required, dependent on final required properties. Hold for a time commensurate with the ruling section and cool in still in air.

Tempering below 450°C could lead to temper embrittlement.

Machining

817M40 has good machinability in the quenched and tempered condition, dependent on condition, and operations such as sawing, turning, broaching, milling etc can be accomplished satisfactorily using standard machine tool manufacturers recommended speeds and feeds

Welding

Welding of 826M40 in the hardened and tempered condition is not advised and should be avoided if possible, as the mechanical properties will be altered in the heat affected zone. If welding is required it should be done using low hydrogen electrodes, while the material is in the annealed condition, and the work piece should be stress relieved (640 - 660°C) immediately after cooling to hand warm, prior to hardening and tempering.

If welding in the quenched and tempered condition, the work piece should be stress relieved at 150°C below the original tempering temperature.

Pre-heat temperature should be at least 370°C