

4140 HIGH TENSILE STEEL

4140 is a 1% Chrome Moly general purpose high tensile steel and is the most commonly used of the high tensile steels. 4140 is generally supplied hardened and tempered (to condition T or U). Pre hardened and tempered 4140 can be further surface hardened by flame or induction hardening as well as nitriding. 4140 is used in almost all industry sectors where high tensile parts/components are required.

Stocked Sizes - Rounds 8 mm – 710 mm Ø
Hexagons 19 mm – 65 mm A/F

Bar Finishes - Hot Rolled, Peeled, Turned & Polished, Cold Drawn & Centreless Ground

Related Specifications

Australia	AS 1444 – 1996 4140
Japan	JIS G4105 SCM440
USA	AISI 4140 ASTM A29/A29M – 91 4140 SAE 4140

Chemical Composition

	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

Mechanical Properties – Hardened & Tempered 4140 to AS1444 (all finishes except cold drawn)*

Mechanical Property Designation		R	S	S	T	U	V	W
Limited Ruling Section mm*		250	250	150	100	63	30	20
Tensile Strength Mpa	Min	700	770	770	850	930	1000	1080
	Max	850	930	930	1000	1080	1150	1230
0.20% Proof Stress (Yield) Mpa	Min	480	540	570	665	740	835	925
Elongation on %	Min	15	13	15	13	12	12	12
Izod Impact J	Min	34	27	54	54	47	47	40
Charpy Impact J	Min	28	22	50	50	42	42	35
Hardness Brinell HB	Min	201	223	223	248	269	293	311
	Max	255	277	277	302	331	352	375

*For Cold Drawn information contact our office or refer to AS1444-1996

Annealing

Heat to 800-850 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.

Normalising

For As Rolled, Heat to 870- 900 Deg C. Hold until temperature is uniform through the section, soak for 10-15 minutes per 25mm of cross section, and allow to cool in still air. For Q&T 4140 normalising temperature is restricted by the tempering temperature of the material otherwise the mechanical properties will be affected. It is highly recommended that normalizing of Q&T steel be undertaken by a recognized heat treatment company.

4145H MODIFIED HIGH TENSILE STEEL

4145H Modified is a Chromium – Molybdenum high tensile steel produced specifically for the Oil and Gas Industry and combines ductility, shock resistance and wear resistance.
Produced to conform to the API Spec 7, 4145H is used to produce Drill Collars, Kelly Bars, Connecting Rods, shafts and gears etc.

Stocked Sizes - Rounds 116 mm – 285 mm Ø

Finishes - Hot Rolled, Peeled

Related Specifications

Australia	
International	API Spec 7

Chemical Composition

	Min. %	Max %
Carbon	0.42	0.49
Silicon	0.15	0.35
Manganese	0.90	1.25
Nickel	0	0.25
Chromium	0.90	1.35
Molybdenum	0.20	0.35
Phosphorous	0	0.035
Sulphur	0	0.04
Copper	0	0.35

Mechanical Properties – Hardened & Tempered

Mechanical Property Designation		API -7
Limited Ruling Section mm*		N/A
Tensile Strength Mpa	Min	970 (140,000 PSI)
	Max	
0.20% Proof Stress (Yield) Mpa	Min	755 (110,000 PSI)
Elongation on %	Min	13
Izod Impact J	Min	
Charpy Impact J	Min	54
Hardness Brinell HB	Min	
	Max	352

Annealing

Heat to 815-850 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.

4340 HIGH TENSILE STEEL

4340 is a 1.8% Nickel-Chrome-Moly high hardenability, high tensile steel. 4340 is generally supplied hardened and tempered (to condition U).

Pre hardened and tempered 4340 can be further surface hardened by flame or induction hardening as well as nitriding. 4340 is used for Heavy duty shafts, Gears spindles, Couplings, Pins. With the addition of Nickel over 4140, 4340 has a better depth of mechanical properties allowing for a larger Limited Ruling Section and resulting in higher core strength at larger diameters.

Stocked Sizes - Rounds 25 mm – 610 mm Ø

Finishes - Hot Rolled, Peeled, Turned & Polished, Centreless Ground

Related Specifications

Australia	AS 1444 – 1996 4340
Japan	JIS G4103 SNCM439
USA	AISI 4340 ASTM A29/A29M – 91 4340 SAE 4340 ASTM A322 43430 UNS G43400

Chemical Composition

	Min. %	Max %
Carbon	0.37	0.44
Silicon	0.10	0.35
Manganese	0.55	0.90
Nickel	1.55	2.00
Chromium	0.65	0.95
Molybdenum	0.20	0.35
Phosphorous	0	0.04
Sulphur	0	0.04

Mechanical Properties – Hardened & Tempered 4340 to AS1444 (all finishes except cold drawn)*

Mechanical Property Designation		R	S	S	T	U	V	W
Limited Ruling Section mm*		250	250	150	100	63	30	20
Tensile Strength Mpa	Min	700	770	770	850	930	1000	1080
	Max	850	930	930	1000	1080	1150	1230
0.20% Proof Stress (Yield) Mpa	Min	480	540	570	665	740	835	925
Elongation on %	Min	15	13	15	13	12	12	12
Izod Impact J	Min	34	27	54	54	47	47	40
Charpy Impact J	Min	28	22	50	50	42	42	35
Hardness Brinell HB	Min	201	223	223	248	269	293	311
	Max	255	277	277	302	331	352	375

*For Cold Drawn information contact our office or refer to AS1444-1996

Annealing

Heat to 800-850 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.

EN26 (X9940) HIGH TENSILE STEEL

EN26 is a 2.5% Nickel-Chrome-Moly high hardenability, high tensile steel & is generally supplied hardened and tempered (to condition V).

Pre hardened and tempered EN26 can be further surface hardened by flame or induction hardening as well as nitriding. EN26 is used for Heavy duty shafts, Axles, Connecting Rods, Spindles, Motor Shafts, Tool and Die holders etc.

Stocked Sizes - Rounds 24 mm – 300 mm Ø

Finishes - Hot Rolled, Peeled, (Turned and Polished/Centreless Ground available against request)

Related Specifications

Australia	AS 1444 – 1996 X9940
Great Britain	BS970 Part 3 1991 – 826M40 BS970 1955 – EN26

Chemical Composition

	Min. %	Max %
Carbon	0.36	0.44
Silicon	0.10	0.35
Manganese	0.45	0.70
Nickel	2.30	2.80
Chromium	0.50	0.80
Molybdenum	0.45	0.65
Phosphorous	0	0.04
Sulphur	0	0.04

Mechanical Properties – Hardened & Tempered EN26 (X9940) to AS1444

Mechanical Property Designation		U	U	V	V	W	W	X
Limited Ruling Section mm*		250	150	250	150	250	150	150
Tensile Strength Mpa	Min	930	930	1000	1000	1080	1080	1150
	Max	1080	1080	1150	1150	1230	1230	1300
0.20% Proof Stress (Yield) Mpa	Min	725	740	820	835	910	925	1005
Elongation on %	Min	12	12	12	12	11	11	10
Izod Impact J	Min	34	47	34	47	27	40	34
Charpy Impact J	Min	28	42	28	42	22	35	28
Hardness Brinell HB	Min	269	269	293	293	311	311	340
	Max	331	331	352	352	375	375	401

Annealing

Heat to 790-840 Deg C. Hold until temperature is uniform throughout the section and allow to cool in furnace.