

CASE HARDENING STEEL – 18CrNiMo7- 6 or 17CrNiMo6

8CrNiMo7- 6 Chrome-Nickel-Moly Carburing Steel generally supplied annealed to HB 229max. Carbured and heat treated it develops a hard wear resistant case to HRC 60-63 and a tough strong core with a typical tensile strength range of 900-1300 MPa, in small to fairly large sections.

Typical Chemical Analysis

Carbon	0.18%
Silicon	0.20%
Manganese	0.70%
Chromium	1.65%
Nickel	1.55%
Molybdenum	0.30%

Typical Applications:

Heavy-duty arbors, bushings, wear pins, bearings, sprockets, gears and shafts etc. Or can be used for high tensile applications uncarbured but through hardened and tempered

Related specifications:

AS 1444-1996	X4317 or X4317H	
EN10084-1998	1.6587	18CrNiMo7-6 or 1.6587H 18CrNiMo7-6H
Werkstoff	1.6587	18CrNiMo7-6 or 17CrNiMo6

Good through hardening properties with excellent toughness due to the low carbon and high alloy content, also suitable for Nitriding.

Typical Mechanical Properties – Quenched and Tempered at 200°C

Section mm	Yield Strength MPa	Tensile Strength MPa	Elongation %	Impact Izod J	Hardness HB
25	1050	1295	14	45	380
50	950	1160	15	51	340
100	815	1010	16	53	300

Typical Mechanical Properties for guidance only

Hardenability Limits – for AS 1444 – X4317H Grade

Distance from quenched end – mm													
Hardness values max - min – HRC													
mm	1.5	3	5	7	9	11	13	15	20	25	30	35	40
HRC	48	48	48	48	47	47	46	46	44	43	42	41	41
HRC	40	40	39	38	37	36	35	34	32	31	30	29	29

Case Hardening – 18CrNiMo7-6 (17CrNiMo6)

Welding:

Readily welded in the annealed condition with the correct procedure, but welding in the case hardened or through hardened condition is not recommended.

HEAT TREATMENT:**Forging:**

Heat to 1150°C Hold till uniform
Minimum forging temperature 850°C
Cool slowly in ashes or sand etc.

Annealing:

Heat to 830°C – 850°C
Cool in furnace

Stress Relieving:

Heat to 630°C – 650°C
Cool in still air

Hardening:

Heat to 820°C – 850°C
Cool in Air or Oil as required

Tempering:

Heat to 150°C – 200°C
Cool in still air

Welding procedure:

The use of low hydrogen electrodes recommended. Pre-heat at 250°C – 350°C and maintain during welding. Cool slowly in ashes etc, followed if possible with a stress-relieve.

Welding details for guidance only

Carburising:

Carburise at 900°C – 950°C

Core Refining:

Heat to 830°C – 870°C
Cool in air, oil or salt bath held at 150°C – 200°C – then air cool

Case Hardening:

Heat to 780°C – 820°C
Quench in oil

Tempering:

Temper at 150°C – 200°C to improve case toughness with minimal effect on its hardness. This will also reduce the possibility of grinding cracks.

Nitriding:

Heat to 500°C – 530°C

Heat treatment details for guidance only