CASE HARDENING STEEL–18CrNiMo7- 6 or 17CrNiMo6

8CrNiMo7- 6 Chrome-Nickel-Moly Carburising Steel generally supplied annealed to HB 229max. Carburised 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 APPLICATIONS:

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

TYPICAL CHEMICAL ANALYSIS

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

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

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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 AS1444 – X 4317H 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 STEEL – 18CrNiMo7 – 6 or 17CrNiMo6 - continued

WELDING:

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

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

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 required

Tempering:

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

Carburising:

Carburise at 900°C – 950°C

Core Refining (Optional):

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 water

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