

CASE HARDENING STEEL – AISI 8620

AISI 8620 Nickel–Chrome–Moly Carburing Steel, generally supplied as rolled to HB 255max. 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 700-1100 MPa, in small to medium sized sections.

Typical Applications:

Arbors, pinions, bushes, camshafts, king pins, ratchets, gears, splined shafts etc. Or can be used for high tensile applications uncarbured but through hardened and tempered.

Typical Chemical Analysis

Carbon	0.20%
Silicon	0.25%
Manganese	0.80%
Nickel	0.55%
Chromium	0.50%
Molybdenum	0.20%

Related specifications:

AS 1444-1996	8620 or 8620H
EN10084-1998	1.6523 20NiCrMo2-2 or 1.6523H 20NiCrMo2-2H
JIS G 4103	SNCM 220 or
JIS G 4052	SNCM 220H
UNS	G86200 or H86200

Through hardening properties fair with good toughness due to the low carbon and medium 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	690	925	17	46	275
100	493	740	20	50	220

Typical Mechanical Properties for guidance only

Hardenability Limits – for AS 1444 – 8620H Grade

Distance from quenched end – mm													
Hardness values max-min – HRC (values under 20 not specified)													
mm	1.5	3	5	7	9	11	13	15	20	25	30	35	40
HRC	48	47	43	39	35	32	30	29	26	24	23	23	23
HRC	41	37	31	25	21	-	-	-	-	-	-	-	-

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Welding:

Readily welded in the as rolled 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 820°C – 850°C
Cool in furnace

Normalising:

Heat to 900°C – 925°C
Cool in still air

Stress Relieving:

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

Hardening:

Heat to 840°C – 870°C
Quench in Oil

Tempering:

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

Welding procedure:

The use of low hydrogen electrodes recommended. Pre-heat at 200°C – 300°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 860°C – 900°C
Quench in oil

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