

CASE HARDENING STEEL–AISI 8620

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

TYPICAL APPLICATIONS:

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

TYPICAL CHEMICAL ANALYSIS

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

RELATED SPECIFICATIONS:

AS 1444-1996	8620 or 8620H
EN10084-1998	1.6523 20NiCrMo2-2 or 1.6523H20NiCrMo2-2H
JIS G 4103 JIS G 4052	SNCM 220 or 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 AS1444 – 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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CASE HARDENING STEEL – AISI 8620 - continued

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.

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

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 furnace

Stress Relieving:

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

Hardening:

Heat to 840°C – 870°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

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