

## Case Hardening Steel Bar 8620H Grade Data Sheet

### Grade 8620H

Grade 8620H is a low Nickel Chromium Molybdenum case hardening steel of medium hardenability used principally for relatively lightly stressed components. Grade 8620H can be carburised and subsequently hardened by a quenching and tempering operation. The “H” designation of 8620H indicates guaranteed hardenability according to the hardenability diagram on the following page.

### Related Specifications

Grade 8620H complies with AS1444 Grade 8620H and/or ASTM A29 Grade 8620. Alternatively, grade 8620H can be supplied as Euronorm grade 20NiCrMo2-2+HH (Material Number 1.6523/1.6526 under EN 10084).

### Chemical Composition (%)

Grade	C	Si	Mn	P	S	Cr	Ni	Mo
8620H	0.17 - 0.23	0.10 - 0.35	0.60 - 0.95	≤ 0.040	≤ 0.040	0.35 - 0.65	0.35 - 0.75	0.15 - 0.25
1.6523	0.17 - 0.23	≤ 0.40	0.65 - 0.95	≤ 0.035	≤ 0.035	0.35 - 0.70	0.40 - 0.70	0.15 - 0.25

### Conditions of Supply

Normally supplied in the annealed condition with hardness max 212 HB, with typical hardness being in the range 170-200 HB. Bars are cold finished (peeled) and supplied to k12 tolerance for all bar diameters.

### Heat Treatment

Treatment	Treatment Range (°C)	Cooling
Carburising	880 - 960	Oil (water), hot quench 160-250°C, Salt bath 580-650°C, Case hardening box, Air*
Intermediate Annealing	630 - 650	Air, Furnace
Core Hardening	860 - 900	Oil (water), hot quench 160-250°C*
Case Hardening	780 - 820	Oil (water), hot quench 160-250°C*
Tempering	150 - 200	Air

\*The choice of cooling medium depends on the desired final properties and geometry of the section to be case hardened and the effect of the cooling medium, given the hardenability of the steel.

After final machining, heat in carburising atmosphere (blank carburise) to 880 to 960°C and hold for sufficient time at temperature to produce the required case depth. The time at temperature during the blank carburising process determines the depth of case achieved.

After completion of blank carburisation treatment, re-heat to 860-900°C, hold until uniform and then quench in oil as rapidly as practical.

A refining treatment is necessary to improve the structure of the case and its hardness. Heat slowly to 780-820°C, hold until uniform and then quench in oil. Single quench treatment may also be possible where components are quenched directly from 820 to 840°C.

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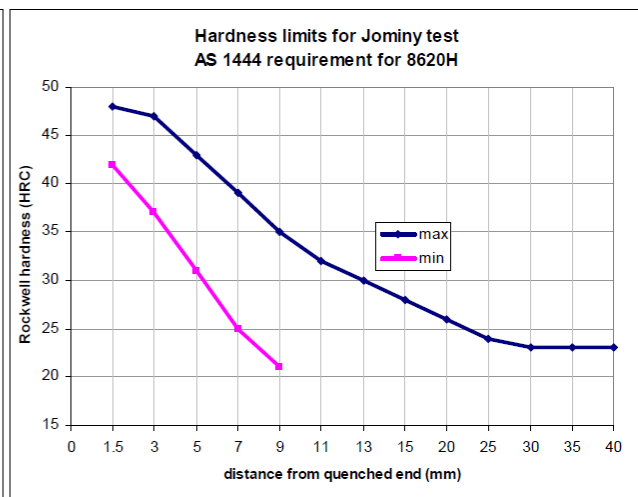
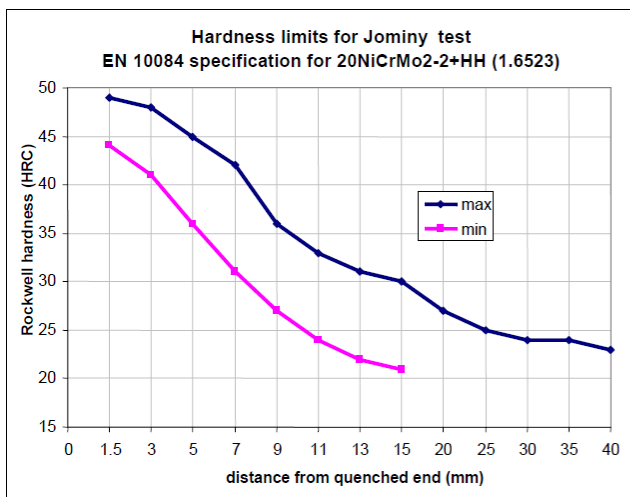
Minimum tempering time is 1 hour, but a tempering period of 1 hour per 25mm of section is recommended. If the steel is to be direct hardened, in general, a carburising temperature of 950°C should not be exceeded. After case hardening a typical case hardness of 61 HRC can be achieved.

### Mechanical Properties after Case Hardening

The following table shows the typical mechanical properties achievable in the core of a test section after carburising, hardening and tempering.

Diameter (mm)	Yield Strength (MPa)	Tensile Strength (MPa)	Elongation (A%)	Impact Value DVM (J)
11	785 min	980 - 1270	9 min	41 min
30	590 min	780 - 1080	10 min	41 min
63	490 min	690 - 930	11 min	-

### Hardenability Diagram



### Welding

Pre-heat welding area to 250-450°C and maintain this temperature while welding with a low hydrogen electrode. Cool at a maximum rate of 100°C per hour. Weld before carburising.

### Applications

Small diameter gear parts exposed to low-medium stress. Typical components include gears, planet wheels, drive pinions and shafts.

#### Limitation of Liability

The information contained in this Atlas Steels Case Hardening Steel Bar 8620H Grade Data Sheet document is not an exhaustive statement of all relevant information. It is a general guide for customers to the products and services available from Atlas Steels and no representation is made or warranty given in relation to this information or the products or processes it describes.