

AISI 8620	AMS 6274
AMS 6276	AMS 6277
AMS 6375	ASTM A29 (8620)
ASTM A322 (8620)	ASTM A331 (8620)
ASTM A506 (8620)	ASTM A507 (8620)
ASTM A513	ASTM A519 (8620)
ASTM A646 (8620-4)	ASTM A752 (8620)
ASTM A829	MIL-S-8690
SAE J1397 (8620)	SAE J404 (8620)
UNS G86200	

Property Results

Chemistry Data : [\[top\]](#)

Carbon	0.18 - 0.23
Chromium	0.4 - 0.6
Manganese	0.7 - 0.9
Molybdenum	0.15 - 0.25
Nickel	0.4 - 0.7
Phosphorus	0.035 max
Silicon	0.15 - 0.35
Sulphur	0.04 max

Principal Design Features

AISI 8620 is a hardenable chromium, molybdenum, nickel low alloy steel often used for carburizing to develop a case-hardened part. This case-hardening will result in good wear characteristics.

Applications

In the carburized condition this alloy is used for gears, ring gears, shafts and crankshafts.

Machinability

Machining is done prior to carburizing to within as close a tolerance as possible. Finish machining, after heat treatment and/or carburizing, should be at a minimum so as not to impair the hardened case of the part. Machining may be done by conventional means prior to heat treatment - after carburizing machining is usually limited to grinding.

Forming

Forming characteristics of 8620 alloy are good

in the annealed condition.

Welding	The alloy may be welded by conventional methods, usually gas or arc welding. Preheating at 400 F is beneficial and subsequent heating after welding is recommended - consult the approved weld procedure for the method used.
Heat Treatment	This alloy may be hardened by heating to 1500 F followed by a water quench. Carburize at 1650 to 1700 F in an appropriate carburizing medium and oil quench to harden. Improved carburized case and core properties can be obtained by furnace cooling from carburizing at 1650 - 1700 F and then reheating to 1575 F.
Forging	The alloy may be forged at 2200 F down to 1800 F prior to the hardening heat treatment or carburizing.
Hot Working	Hot working may be accomplished prior to hardening or carburizing. Consult the alloy supplier for information as to temperatures.
Cold Working	The alloy may be cold worked in the annealed condition by conventional methods. Cold working, as with machining, should be done to as close a tolerance as possible before heat treatment or carburizing.
Annealing	AISI 8620 may be given a full anneal at 1550 F and slow cooling at not more than 50 F per hour down to 850 F. From there it may be air cooled.
Aging	Not applicable to this alloy.
Tempering	Tempering of carburized parts is done at 250 to 300 F and this will result in the alloy having a core strength of approximately 135 ksi minimum with Rockwell C case hardness of 90. Tempering of heat treated and water

quenched parts (not carburized) is done at 400 F to 1300 F with greater hardness the lower the tempering temperature.

Hardening

Hardening is done by oil quench from 1675 F. See "Heat Treatment". Carburizing is accomplished at the same 1650 to 1700 F range in a carburizing "pack" or environment, followed by oil quench for thin sections or a furnace cool for heavier (over 3/4") sections. Following carburizing of heavy sections a reheat at 1575 F will enhance both case and core properties of the alloy.

**Other
Comments**

This alloy is typically used for carburized parts where a hardened case is desired for wear resistance.

Physical Data : [top]

Density (lb / cu. in.)	0.283
Specific Gravity	7.8
Specific Heat (Btu/lb/Deg F - [32-212 Deg F])	0.1
Melting Point (Deg F)	2600
Thermal Conductivity	26
Mean Coeff Thermal Expansion	6.6
Modulus of Elasticity Tension	31