

Alloy



3312

AISI/SAE 3312 a 3 ½% Nickel-Chromium Case Hardening Alloy Steel															
Typical Analysis	<table border="1"> <thead> <tr> <th>C</th> <th>Mn</th> <th>P</th> <th>S</th> <th>Si</th> <th>Ni</th> <th>Cr</th> </tr> </thead> <tbody> <tr> <td>.11</td> <td>.47</td> <td>.010</td> <td>.002</td> <td>.27</td> <td>3.33</td> <td>1.47</td> </tr> </tbody> </table>	C	Mn	P	S	Si	Ni	Cr	.11	.47	.010	.002	.27	3.33	1.47
C	Mn	P	S	Si	Ni	Cr									
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Characteristics	<ul style="list-style-type: none"> High alloy carburizing grade for those heavy-duty applications requiring high core strength, toughness and fatigue resistance over and above the widely used AISI 8620. Core strengths in the order of 170,000 psi (1172 N/mm²) are attainable. It is the preferred grade for carburized parts in severe operating conditions with excellent low-temperature properties. 3312 may also be used in the heat treated, non-carburized condition for many applications requiring extra strength and toughness. It is normally supplied in the annealed condition and hardness HB 212 would be typical. 														
Typical Applications	<ul style="list-style-type: none"> Heavy-duty gears, pinions, spline shafts, piston pins, transmission components, rock drilling bit bodies, plastic molds, etc. 														
Typical Heat Treatment	<ul style="list-style-type: none"> Forging <ul style="list-style-type: none"> Commence 1215°C max. Finish 925°C Bury in Mica. Annealing <ul style="list-style-type: none"> 840°C Furnace cool Normalizing <ul style="list-style-type: none"> 900°C Air cool Hardened & Tempered (Uncarburized) - Heat to 815°C/ 840°C and oil quench or Heat to 840°C/ 870°C and air quench, then temper at 200°C/ 650°C according to properties required. Case Hardening - single refining treatment. After carburizing at 900°C/ 925°C, cool to RT. Reheat to 775°C/ 800°C, oil quench and temper at 200°C. 														
Mechanical Properties	<ul style="list-style-type: none"> Typical as supplied, Annealed. Tensile Strength – 102,000 psi <ul style="list-style-type: none"> 2Tensile Strength – 704 N/mm Yield Strength - 80,000 psi <ul style="list-style-type: none"> 2Yield Strength – 552 N/mm Elongation - 24% Reduction of Area - 65% Hardness - HB 212 Machinability - 40 														