

# COMPARISON OF CARBON AND ALLOY STEEL BARS

	1018	1045	4140 CD/AN	4140 H.T.	4340 H.T.
<b>FATIGUE RESISTANCE</b>	Poor	Moderate	Fair	Fair	Excellent
<b>MACHINABILITY</b>	Good	Good	Good	Good	Good
<b>TYPICAL CHEMICAL ANALYSIS</b>	%	%	%	%	%
<b>CARBON</b>	.15/.20	.43/.50	.38/.43	.38/.43	.38/.43
<b>MANGANESE</b>	.60/.90	.70/1.00	.75/1.00	.75/1.00	.60/.90
<b>SULPHUR</b>	.050 MAX	.050 MAX	.040 MAX	.040 MAX	.040 MAX
<b>PHOSPHORUS</b>	.040 MAX	.040 MAX	.035 MAX	.035 MAX	.035 MAX
<b>SILICON</b>	--	--	.15/.35	.15/.35	.15/.35
<b>NICKEL</b>	--	--	--	--	1.65/2.00
<b>CHROMIUM</b>	--	--	.80/1.10	.80/1.10	.70/.90
<b>MOLYBDENUM</b>	--	--	.15/.25	.15/.25	.20/.30
<b>HEAT TREATMENT</b>	<b>AS ROLLED</b>	<b>AS ROLLED</b>	<b>COLD DRAWN ANNEALED</b>	<b>QUEN &amp; TEMP NORMALIZED</b>	<b>QUEN &amp; TEMP NORMALIZED</b>
<b>HARDNESS RANGE</b>	116 BHN	163 BHN	200/220 BHN	289/321 BHN	271/321 BHN
<b>TENSILE STRENGTH (PSI)</b>	60,000	82,000	105,000	120,000/157,000	140,000/170,000
<b>YIELD POINT (PSI)</b>	45,000	45,000	90,000	101,000/144,000	124,000/160,000
<b>ELONGATION %</b>	20	16	22	18	15
<b>REDUCTION OF AREA %</b>	45	40	63	58	58