

# B7 Heavy Hex Head Screws

Earnest Machine Products line of B7 Heavy Hex Cap Screws are manufactured to the material and physical properties specified by the American Society for Testing and Materials standard ASTM A193 for Grade B7. The overall dimensions are made to the requirements of ASME B18.2.1 for heavy hex cap screws.

Grade B7 heavy hex bolts are manufactured from alloy steel and are through hardened and tempered to achieve a tensile strength greater than 125,000 psi. The multiple heat treat process used to hardened Grade B7 bolts is designed to provide an excellent strength to toughness ratio for commercially available cap screws.

Grade B7 provides higher strength than Grade 5 bolts with greater ductility than Grade 8. Grade B7 is an excellent choice when a fastener that is stronger than Grade 5 is needed with better fatigue and toughness than a Grade 8.

The heavy hex designs ensures that the clamp loads developed in the assembly are distributed over a larger area than standard hex heads and the heavy hex also provides a larger wrenching area to resist rounding out of the head.

Grade B7 bolts are extensively used in the refinery and piping industry for their excellent strength to toughness ratio and high temperature properties. The B7 strength to toughness ratio ensures solid assemblies while resisting fatigue and bending failures.

### Physical Properties:

<b>Tensile Strength</b>	<b>Yield Strength</b>	<b>Elongation</b>	<b>Reduction of Area</b>
125,000 psi min	105,000 psi min	16% min	50% min

### Heat Treatment: Quench and Tempered to

<b>Hardness</b>	<b>Minimum Tempering Temperature</b>
Rc 35 max	1100° F

**Material:** Alloy Steel containing Chromium and Molybdenum (typical steels 4140, 4140H, 4142, 4142H, 4145)

<b>Element</b>	<b>Range</b>	<b>Element</b>	<b>Range</b>
Carbon	0.37 – 0.49	Silicon	0.15 – 0.35
Manganese	0.65 – 1.10	Chromium	0.75 – 1.20
Phosphorus, max	0.035	Molybdenum	0.15 – 0.25
Sulfur, max	0.040		

Earnest Machine Products recommends the use of ASTM A194 Grade 2H Heavy Nuts and ASTM F436 hardened flat washers are used with B7 cap screws.