



TBBD97

## TECHNICAL BULLETIN

### 4140HT Heat Treated to BHN 248/293

Typical Analysis:	Carbon 0.40/0.50	Mang. 0.90	Chromium 1.00	Moly. 0.20
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Color Code: Pink with White Stripe

#### CHARACTERISTICS

**MACHINABILITY** — 4140HT steel has a machinability rating of 95 as compared to a rating of 100 for a 1% carbon tool steel.

**DISTORTIONAL PROPERTIES** — Due to the method of processing, 4140HT steel is as free from residual stress as possible. Reasonable care in machining an equal amount evenly from each side of the piece will result in minimum deformation and warping.

**COMPRESSIVE STRENGTH** — To obtain values for this property, specimens were taken from large and small sections, machined oversize, heat-treated and finished by grinding to 0.505 in. diameter x 0.750 in. long. The specimens were checked for hardness and were then compressed between hardened steel plates. The specimens tested showed a hardness of 269 Brinell and indicated that both small and large sections developed compressive yield strength in excess of 110,000 psi, which indicates that 4140HT steel has adequate compressive strength to meet the maximum demand of heavy-duty brake-die service and machine parts.

**TENSILE PROPERTIES** — Pre-hardened 4140HT has an ultimate tensile strength of approximately 120,000/142,000 psi which is ideal for tools of this type.

Typical tensile properties of 1 in. round bar stock after oil quenching and tempering are listed in Figure 1.

Tempering Temperature °F	Tensile Strength	Yield Point	Elongation	Reduction	Brinell Hardness
800	232,000	215,700	10.0	35.5	444
900	209,700	195,300	11.3	44.6	415
1000	189,700	177,300	13.7	48.0	375
1100	172,300	157,000	15.2	51.9	352
1200	146,000	134,000	17.8	58.3	302
1300	119,000	109,000	21.7	61.0	248

Figure 1

**FLAME-HARDENING** — Small surface areas on tools made of 4140HT can be hardened by merely heating with any oxyacetylene torch for a few seconds (long enough to heat the surface to a cherry red color, about 1500°F). No quenching is required. The portion of the steel heated will harden to Rockwell C55/60 because of the rapid cooling produced by the conduction of heat from the small heated spot into the larger adjacent areas which have not been heated.

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