



Ancorsteel® 50 HP

Ancorsteel 50 HP is a new water atomized, prealloyed low-alloy steel powder for high performance applications. The prealloyed 0.50 weight % (w/o) molybdenum addition results in high compressibility and provides good response to heat treatment.

Ancorsteel 50 HP complements other prealloyed powders in which molybdenum is used as the principal alloying addition; Ancorsteel 85 HP (0.85 w/o Mo) and Ancorsteel 150 HP (1.5 w/o Mo). Ancorsteel 50 HP is an ideal base powder for a wide range of nickel-copper and chromium-manganese hybrid alloy systems.

Typical Analysis and Properties

Composition (weight %) (w/o)

| C | Mn | Mo | O |
|-------|------|------|------|
| <0.01 | 0.18 | 0.50 | 0.09 |

Apparent Density

2.97 g/cm³

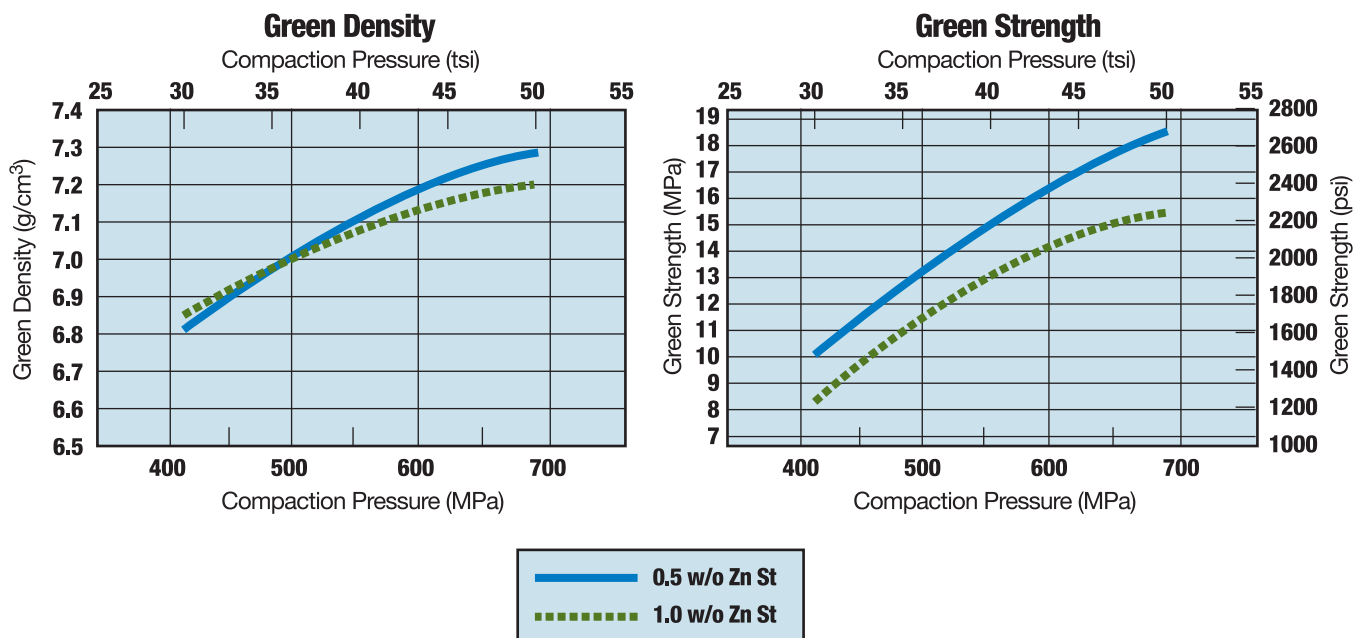
Flow

24 s/50 g

Sieve Distribution (w/o)

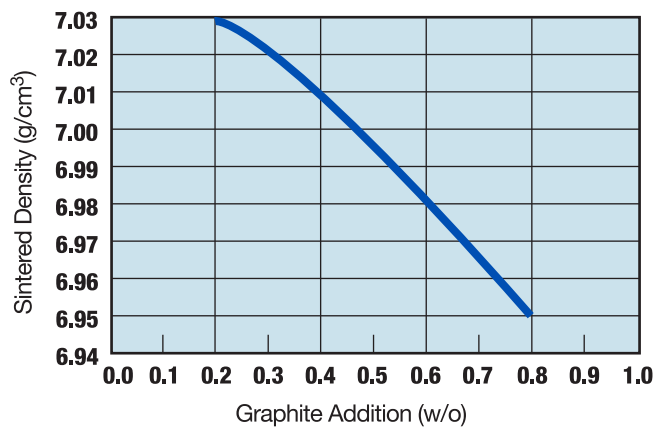
| Micrometers | +250 | -250 / +150 | -150 / +45 | -45 |
|--------------------|-------|--------------|---------------|--------|
| U.S. Standard Mesh | (+60) | (-60 / +100) | (-100 / +325) | (-325) |
| | Trace | 11 | 66 | 23 |

The Effects of Compaction Pressure on Green Properties

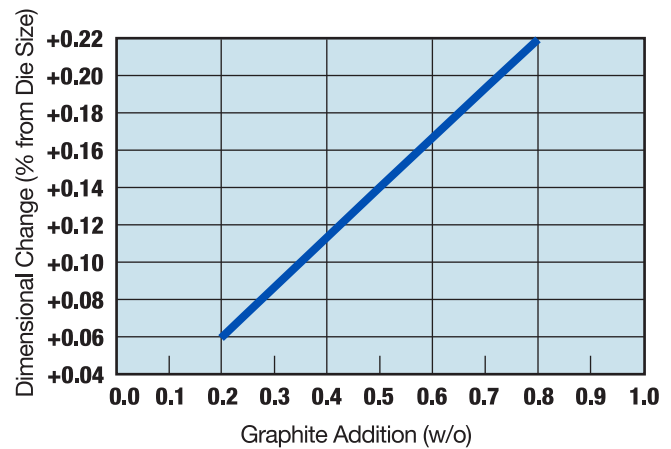


Ancorsteel® 50 HP

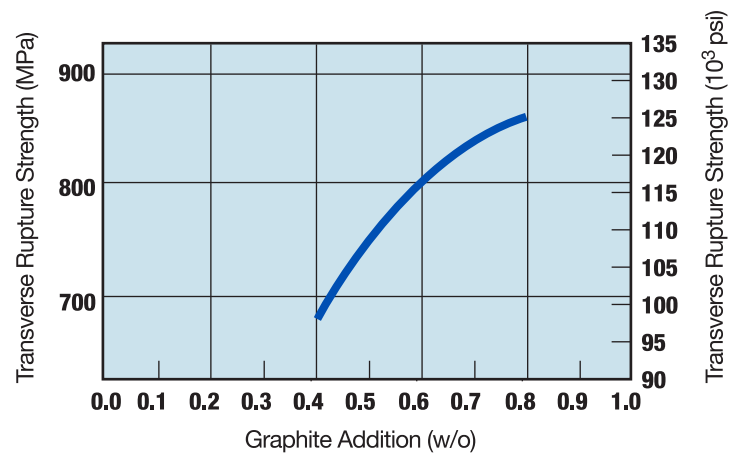
Sintered Density



Dimensional Change



Transverse Rupture Strength

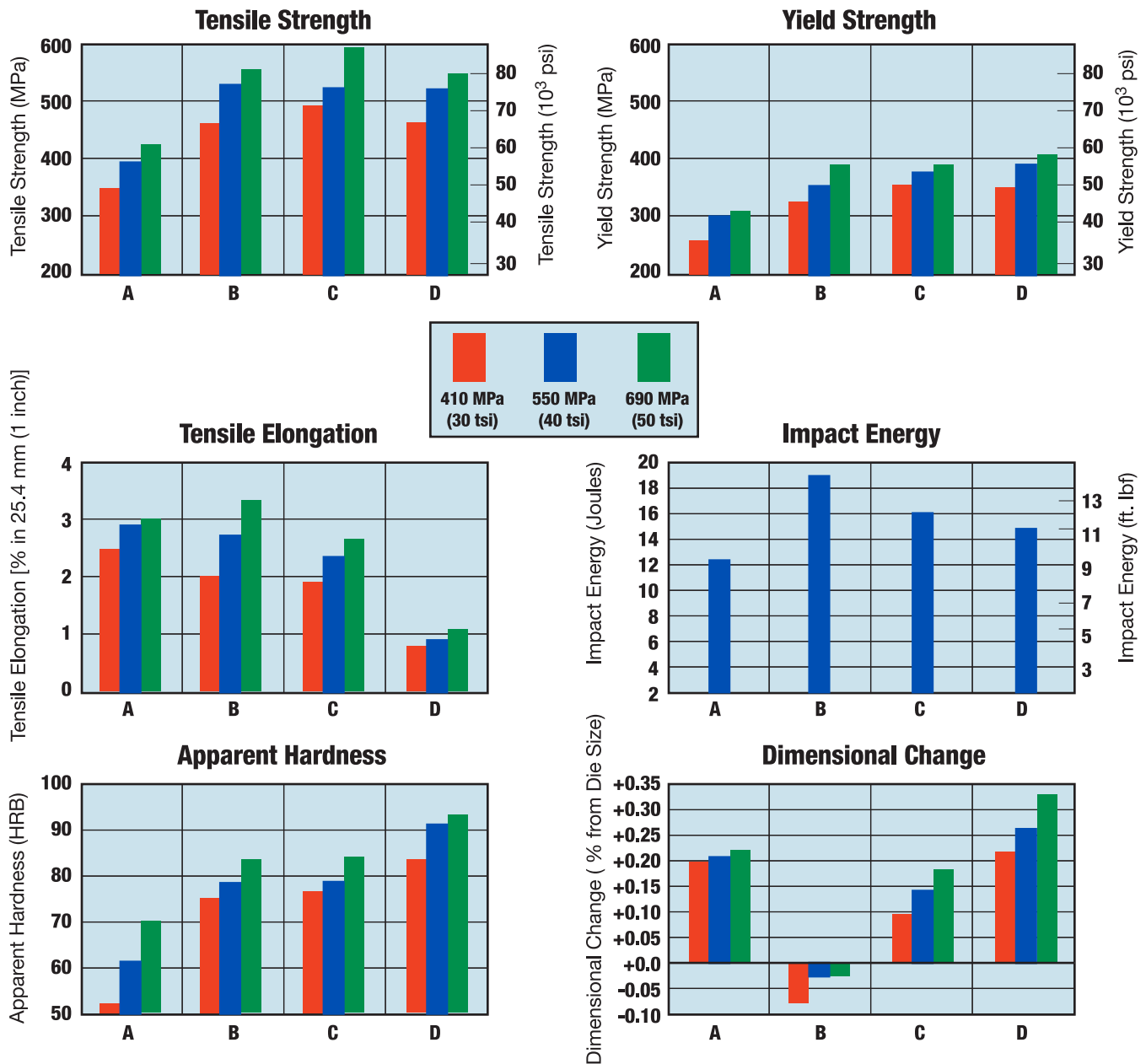


All test specimens were compacted at 550 MPa (40 tsi) and sintered at 1120°C (2050°F) for 30 minutes at temperature in a 75 v/o Nitrogen/ 25 v/o Hydrogen furnace atmosphere.

Ancorsteel® 50 HP

The Effects of Compaction Pressure on the Mechanical Properties

| | A | B | C | D |
|----------------|------|------|------|------|
| Nickel (w/o) | — | 2.0 | 2.0 | 2.0 |
| Copper (w/o) | — | — | 1.0 | — |
| FeMn (w/o) | — | — | — | 1.3 |
| Graphite (w/o) | 0.60 | 0.60 | 0.60 | 0.55 |
| Acrawax | 0.75 | 0.75 | 0.75 | 0.75 |

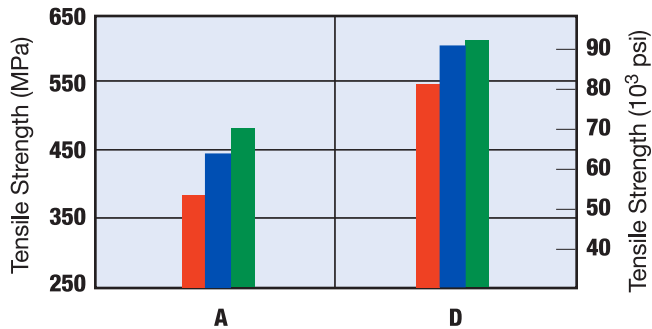


All test specimens were sintered at 1120°C (2050°F) for 30 minutes at temperature in a 75 v/o Nitrogen/ 25 v/o Hydrogen furnace atmosphere

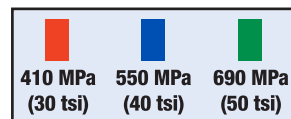
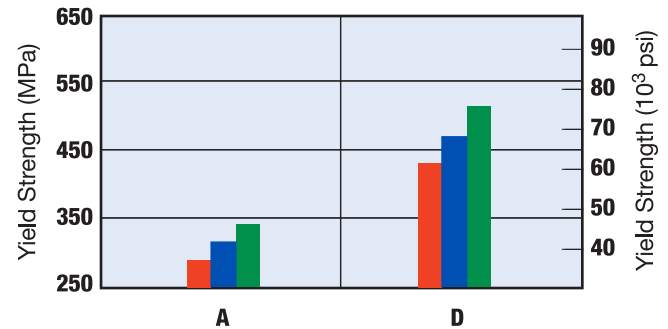
Ancorsteel® 50 HP

| | A | D |
|----------------|------|------|
| Nickel (w/o) | — | 2.0 |
| FeMn (w/o) | — | 1.3 |
| Graphite (w/o) | 0.60 | 0.55 |
| Acrawax | 0.75 | 0.75 |

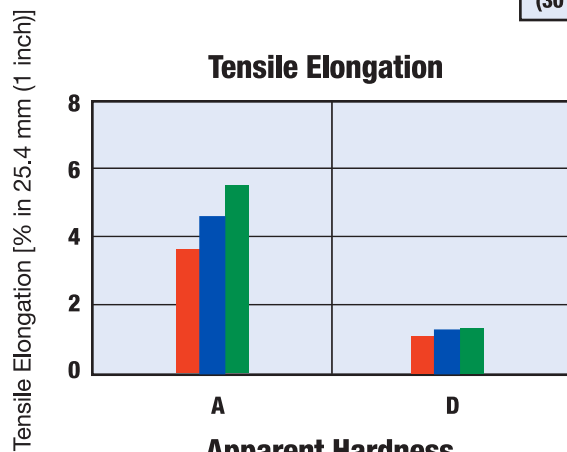
Tensile Strength



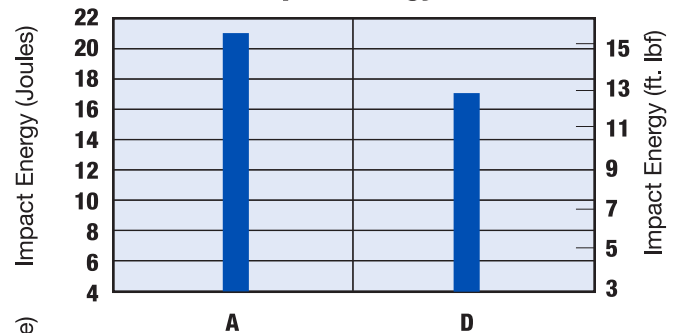
Yield Strength



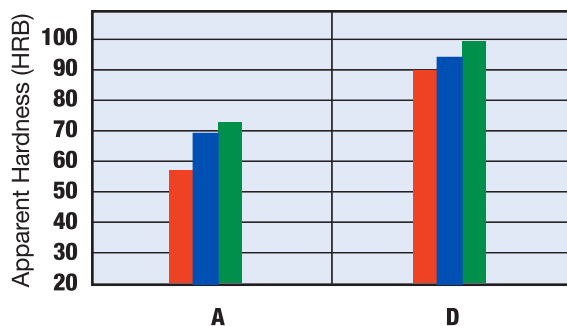
Tensile Elongation



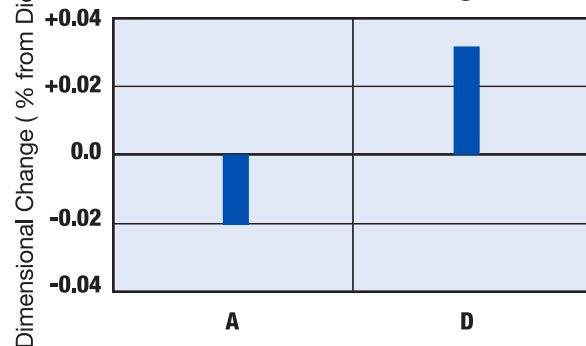
Impact Energy



Apparent Hardness



Dimensional Change

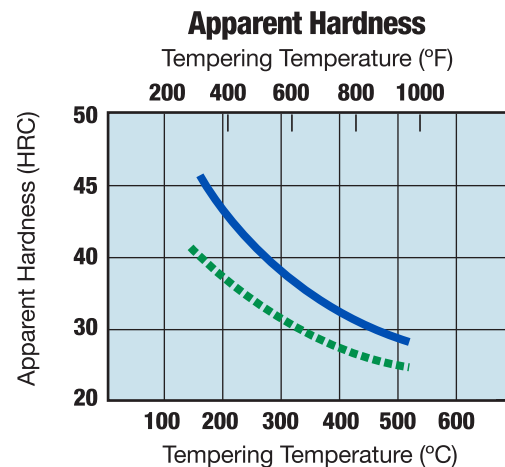
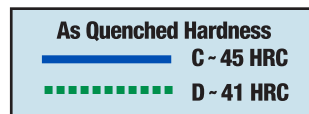
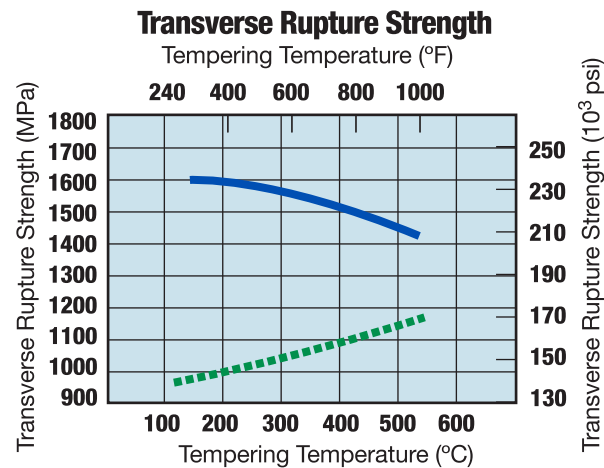


All test specimens were sintered at 1290°C (2350°F) for 30 minutes at temperature in a 75 v/o Nitrogen/ 25 v/o Hydrogen furnace atmosphere.

Ancorsteel® 50 HP

Heat Treated Properties

| | C | D |
|----------------|------|------|
| Nickel (w/o) | 2.0 | 2.0 |
| Copper (w/o) | 1.0 | — |
| FeMn (w/o) | — | 1.3 |
| Graphite (w/o) | 0.60 | 0.55 |
| Acrawax | 0.75 | 0.75 |



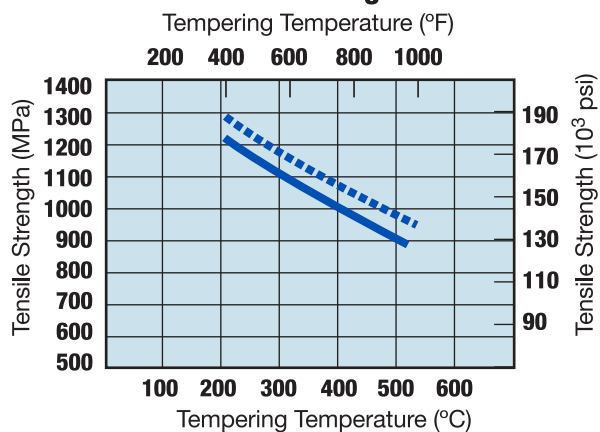
All test specimens were compacted at 550 MPa (40 tsi) and sintered at 1120°C (2050°F) for 30 minutes at temperature in a 75 v/o Nitrogen/ 25 v/o Hydrogen furnace atmosphere. Specimens were then austenitized at 900°C (1650°F) for 30 minutes at temperature with a carbon potential of 0.6 w/o, followed by a quenching in oil at 60–70°C (140–160°F).

Ancorsteel® 50 HP

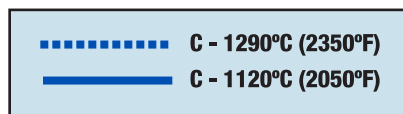
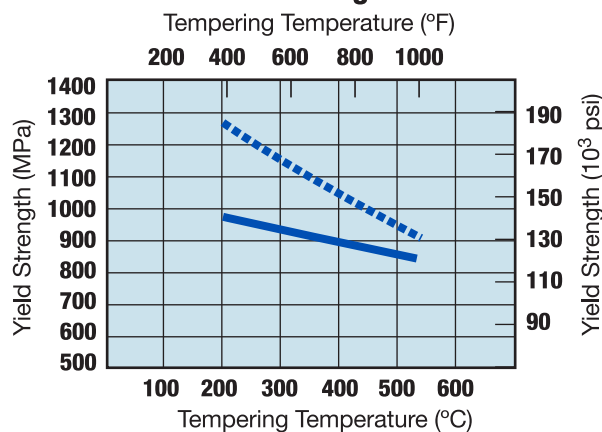
Heat Treated Properties

| | C | D |
|----------------|------|------|
| Nickel (w/o) | 2.0 | 2.0 |
| Copper (w/o) | 1.0 | — |
| FeMn (w/o) | — | 1.3 |
| Graphite (w/o) | 0.60 | 0.55 |
| Acrawax | 0.75 | 0.75 |

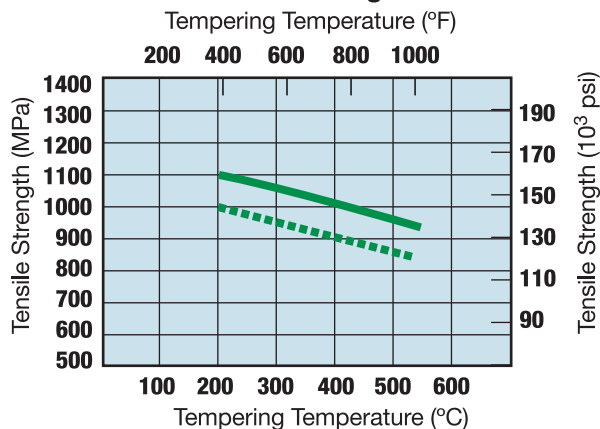
Tensile Strength



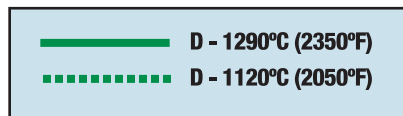
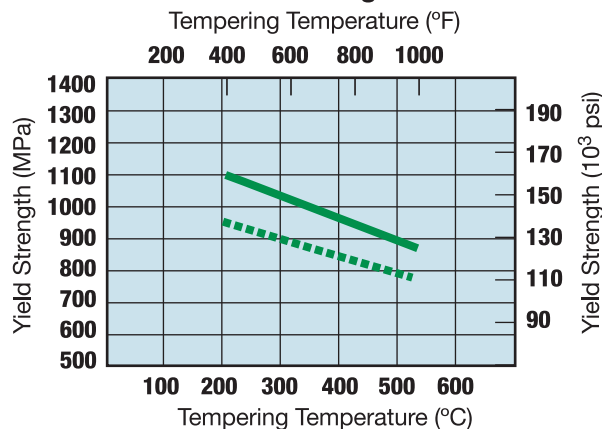
Yield Strength



Tensile Strength



Yield Strength



All test specimens were compacted at 550 MPa (40 tsi) and sintered at 1120°C (2050°F) or 1290°C (2350°F) and quenched and tempered.

IMPORTANT NOTICE: The data shown are based on laboratory processing standard test specimens. Results may vary from that obtained in production processing.