



# Ancorsteel® 1000 / 1000B / 1000C

## The three most specified Ancorsteel grades

In the powder production process used to make Ancorsteel, molten steel is atomized into irregular, homogeneous particles which are then annealed to produce the uniform, dependable steel powders designated as "Ancorsteel". Ancorsteel grades are designed for P/M parts requiring densities exceeding  $6.7 \text{ g/cm}^3$ .

### Ancorsteel 1000

This is the workhorse of our atomized powders, the material that has advanced P/M into the modern age of higher density compacts. More P/M components have Ancorsteel 1000 as their base than any other atomized powder.

It has low levels of carbon and oxygen along with good compressibility. Ancorsteel 1000 provides excellent physical properties with small additions of graphite, copper, or nickel. Ancorsteel 1000 is also available with guaranteed low levels of inclusions for powder forging applications.

### Why Ancorsteel 1000 series powders are preferred

- **Purity**—Special melt practices and select raw materials input give us consistently lower levels and better control of residual and tramp elements.
- **Compressibility**—Strict controls in annealing and iron powder screening result in the highest compressibility powders available.
- **Green Properties**—The technology of iron powder atomization and control of particle shape provide parts with uniform green density and excellent strength.
- **Sintered Strength**—Purity, compressibility and excellent green properties create higher strength components when sintered than are possible with lesser quality materials.
- **Quality**—Uniform, high volume production utilizing state-of-the-art SPC techniques at each processing stage assures the highest standards of consistency. **Why**

### Ancorsteel 1000B

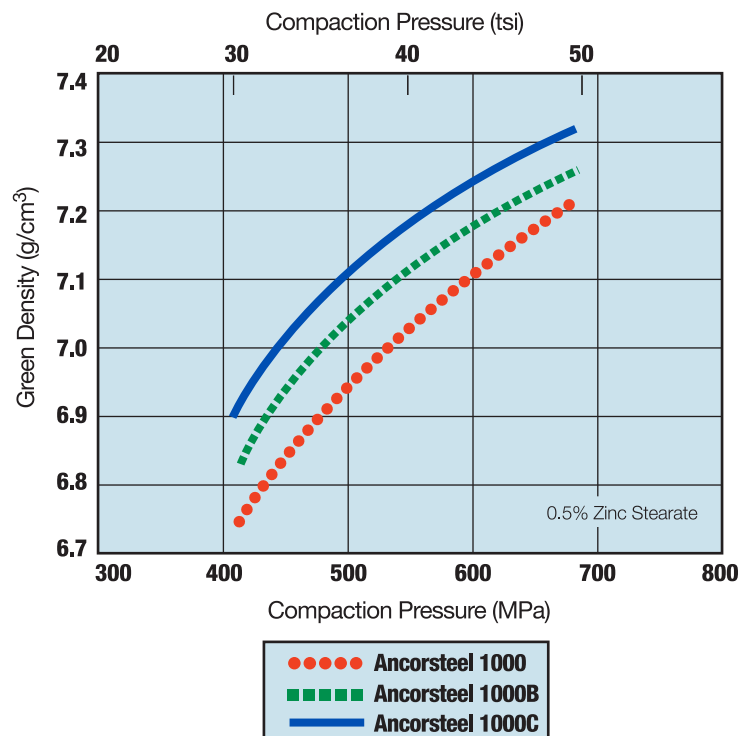
Ancorsteel 1000B is the second generation of atomized high compressibility powders. High purity provides greater compressibility than Ancorsteel 1000; densities of  $6.8 \text{ g/cm}^3$  at 410 MPa (30 tsi) are commonly achieved.

The combination of purity, compressibility, and green strength makes Ancorsteel 1000B ideal for high strength, high density, multi-level structural components.

### Ancorsteel 1000C

This is the highest compressibility iron powder available. Compressibility ratings of  $7.1 \text{ g/cm}^3$  at 550 MPa (40 tsi) provide outstanding sintered properties at lower compacting pressures. With Ancorsteel 1000C, you can achieve densities equivalent to other powders with lower compacting pressures, and thus extend the effective working range of your compacting press. Due to its low oxygen and nitrogen levels, Ancorsteel 1000C is also used extensively for electromagnetic applications.

## COMPRESSIBILITY: Ancorsteel 1000, 1000B, 1000C



**Ancorsteel 1000C** is the highest compressibility iron powder available. Compressibility ratings of 7.1g/cm<sup>3</sup> at 550MPa (40 tsi) provide outstanding sintered properties at lower compacting pressures.

With Ancorsteel 1000C, you can achieve densities equivalent to other powders with lower compacting pressures, and thus extend the effective working range of your compacting press. Due to its low oxygen and nitrogen levels, Ancorsteel 1000C is also used extensively for electromagnetic applications.

## Typical Analysis and Properties

### Composition (weight %) (w/o)

C	O	N	S	P	Si	Mn	Cr	Cu	Ni
<0.01	0.07	0.001	0.007	0.004	<0.01	0.07	0.02	0.03	0.04

### Apparent Density

2.92 g/cm<sup>3</sup>

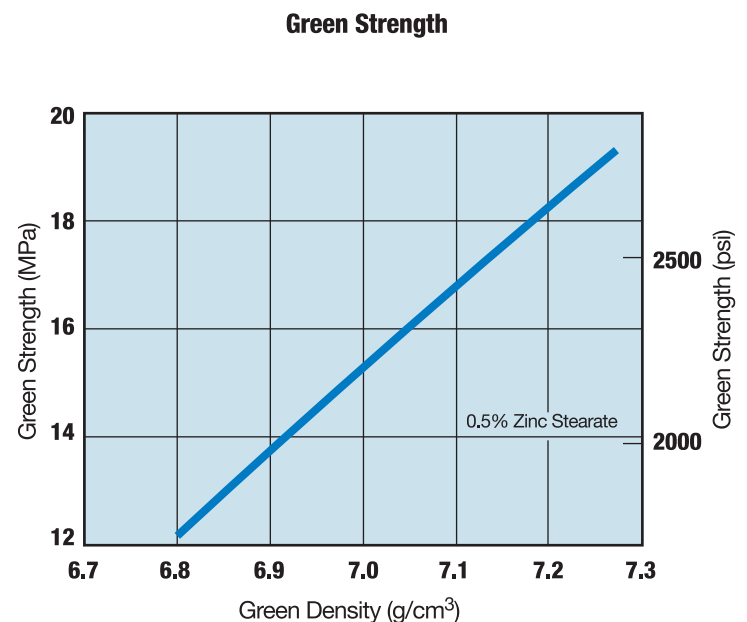
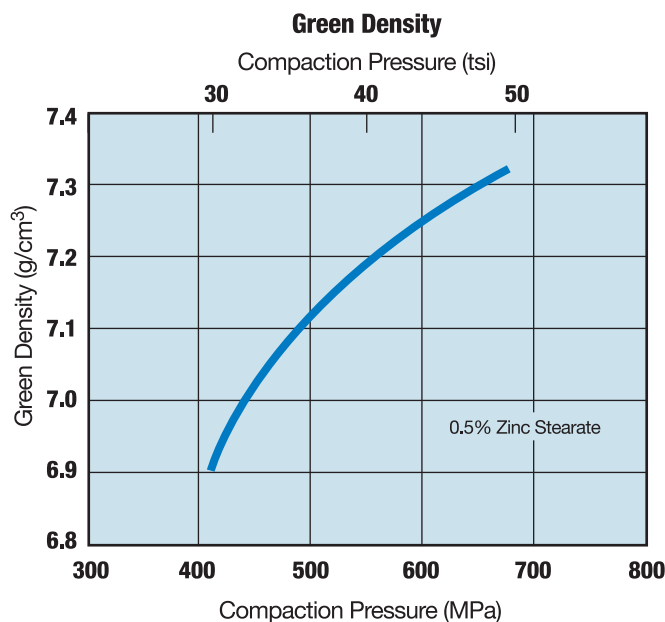
### Flow Rate

25 s/50g

### Sieve Distribution (w/o)

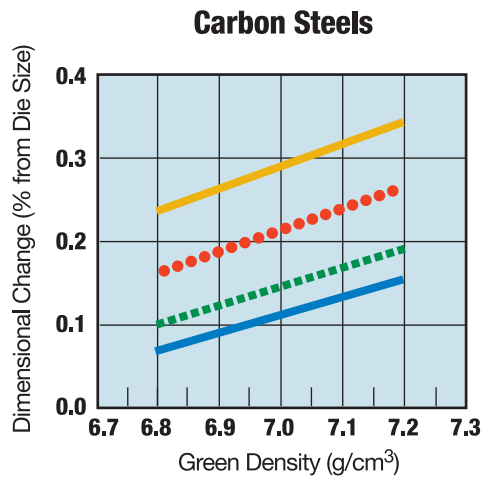
Micrometers	+250	-250 / +150	-150 / +45	-45
U.S. Standard Mesh	(+60)	(-60 / +100)	(-100 / +325)	(-325)
	Trace	17	70	13

## The Effect of Compaction Pressure on the Green Density and Green Strength of Ancorsteel 1000C

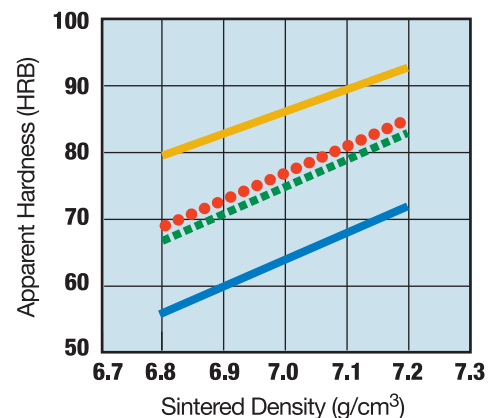
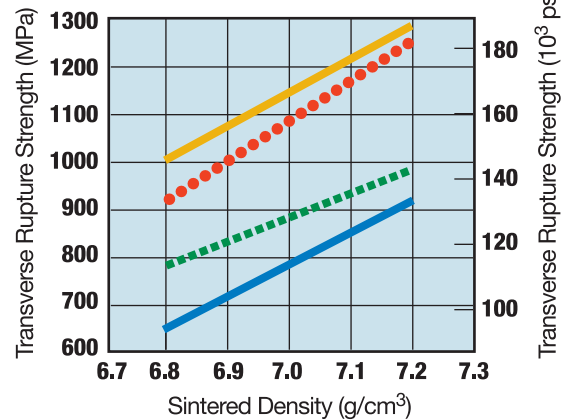
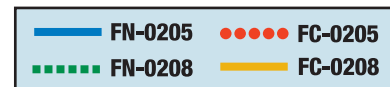
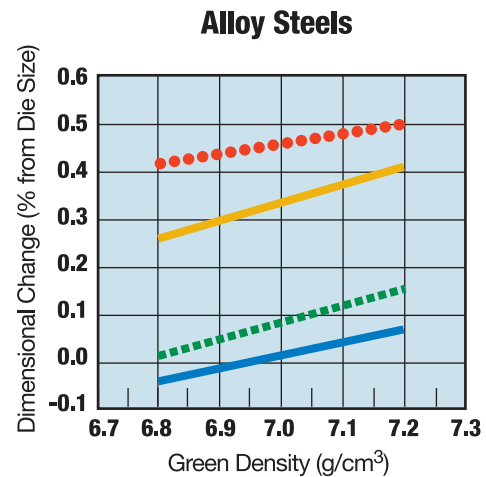
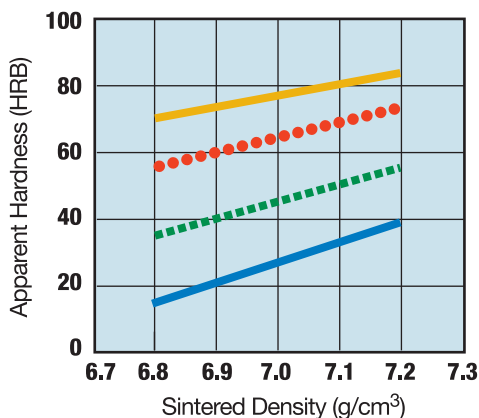
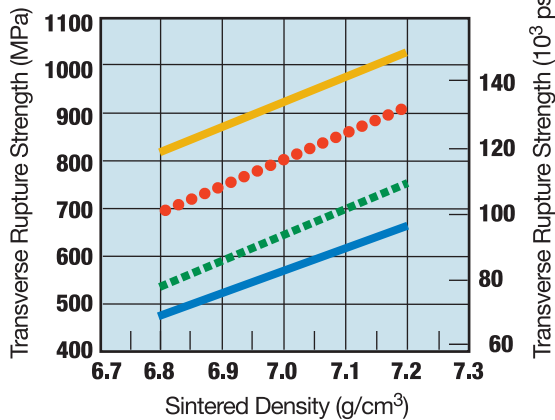
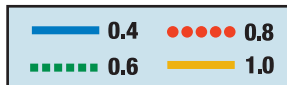


# Ancorsteel® 1000C

## Sintered Properties



Graphite Addition (w/o)

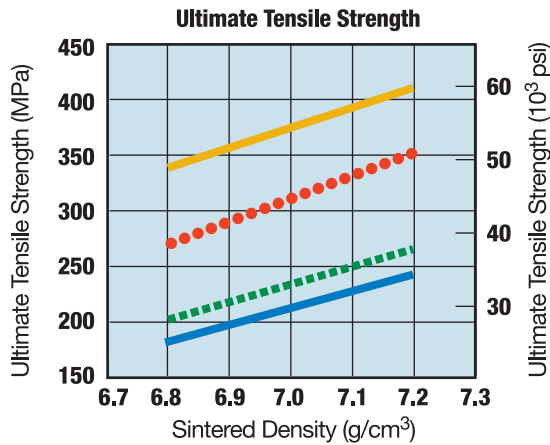


1. Test specimens were pressed to various densities, sintered in dissociated ammonia at 1120°C (2050°F) for 30 minutes at temperature.
2. The alloy mixes contained 2.0 w/o copper or 2.0 w/o nickel. The FN-0205 and FC-0205 mixes contained 0.6 w/o graphite, whereas the FN-0208 and the FC-0208 mixes contained 0.9 w/o graphite.
3. All mixes contained 0.5 w/o zinc stearate as a lubricant.
4. The dimensional change values represent the percentage from die size in accordance with ASTM B 610.

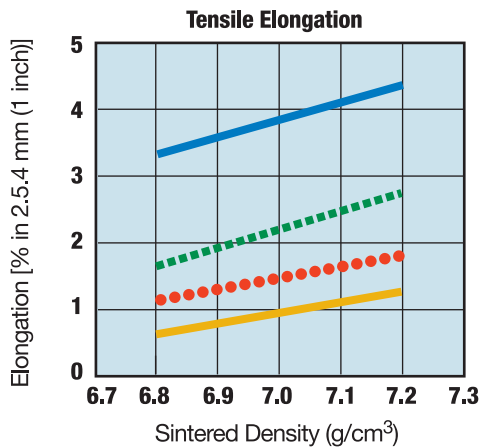
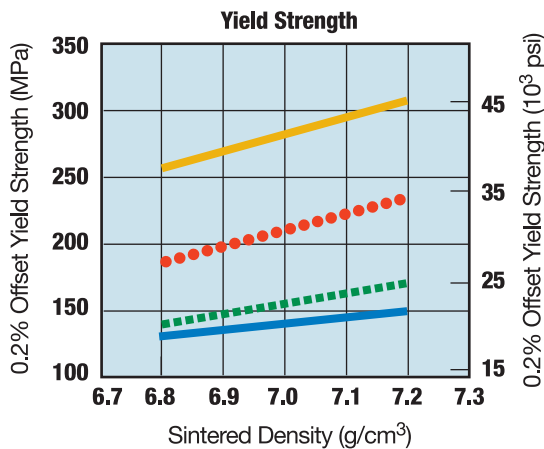
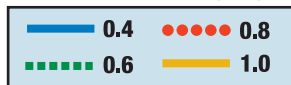
# Ancorsteel® 1000C

## Tensile Properties

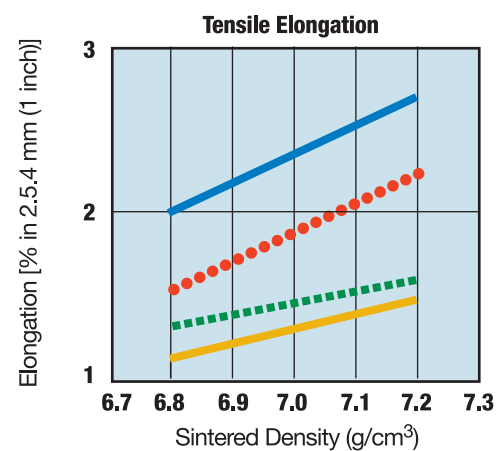
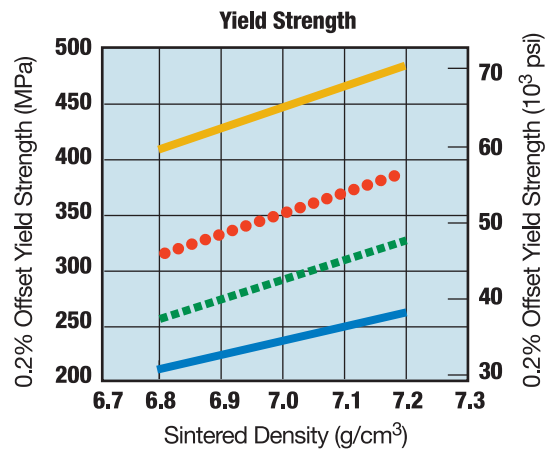
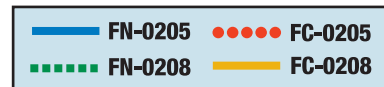
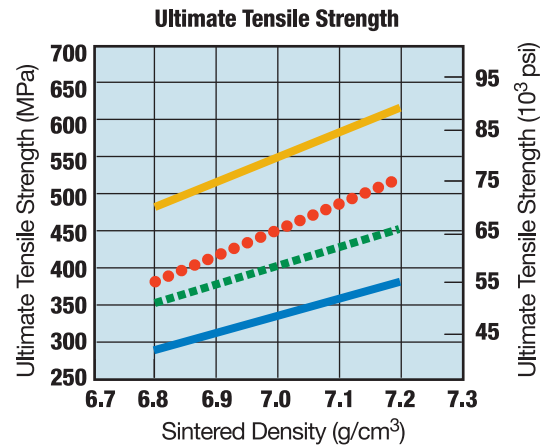
### Carbon Steels



Graphite Addition (w/o)



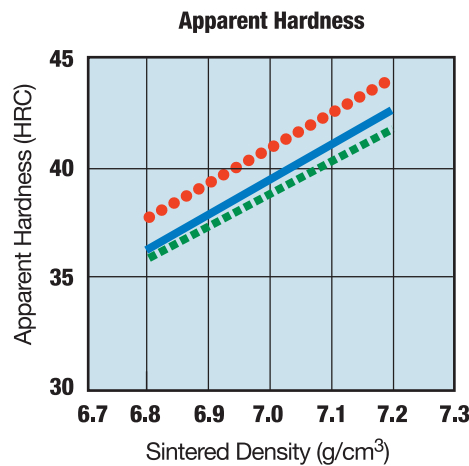
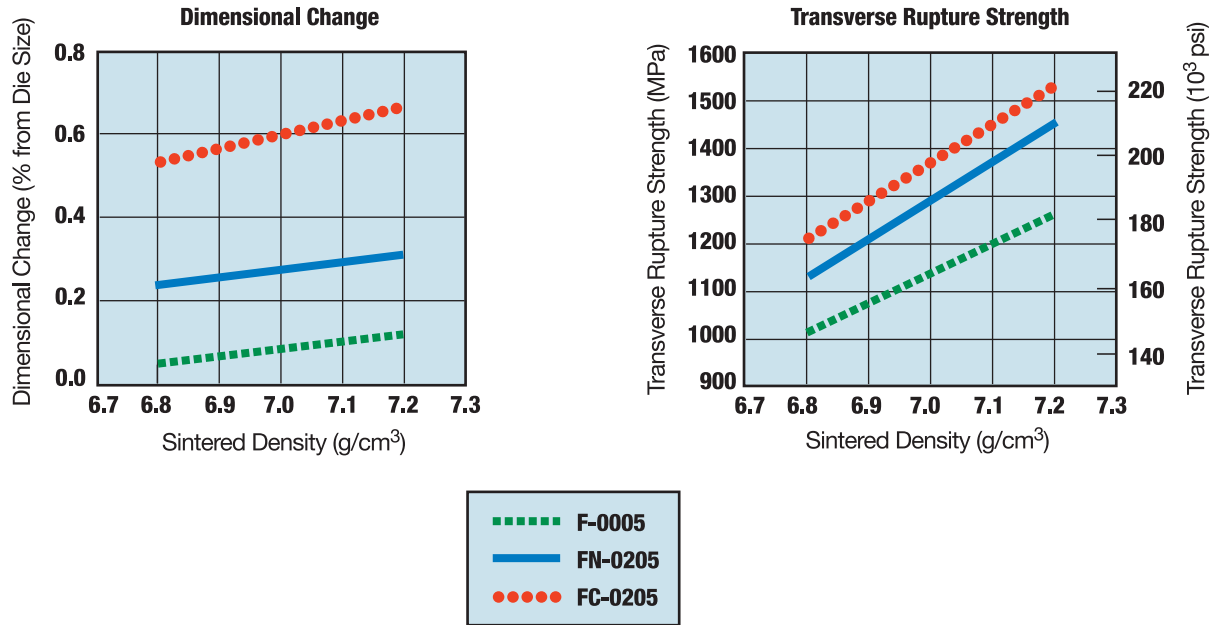
### Alloy Steels



1. Tensile test specimens using the flat unmachined test bars were prepared and tested in accordance with ASTM E 8.
2. The alloy mixes contained 2.0 w/o copper or 2.0 w/o nickel. The FN-0205 and FC-0205 mixes contained 0.6 w/o graphite, whereas the FN-0208 and the FC-0208 mixes contained 0.9 w/o graphite.
3. All mixes contained 0.5 w/o zinc stearate as lubricant.

# Ancorsteel® 1000C

## Heat Treated Properties



- Specimens were austenitized at 845°C (1550°F) for 15 minutes at temperature followed by quenching in oil at 65°C (150°F). The atmosphere was dissociated ammonia with methane additions. The quenched parts were tempered for one hour at 205°C (400°F) in air.
- The alloy mixes contained 2.0 w/o copper or 2.0 w/o nickel. The F-0005, FN-0205 and FC-0205 mixes contained 0.6 w/o graphite.
- All mixes contained 0.5 w/o zinc stearate as a lubricant.
- The dimensional change values represent the percentage from die size in accordance with ASTM B 610.

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