

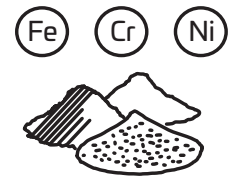
Applications

Ancorsteel 4300 alloys are press-ready, binder-treated chromium steels for high performance applications. Excellent strength, hardenability, fatigue and toughness characteristics in the single press/single sinter condition provide a cost-effective alternative to alloys that require secondary thermal treatments. High temperature sintering is recommended with these alloys to achieve optimum properties. Two levels of molybdenum are available to provide cost and performance options. Enhanced hardness and strength can be achieved with accelerated cooling in the sintering furnace. Other advantages of the alloy system include good compressibility and dimensional stability.

Typical Analysis and Properties

Alloy Composition – weight percent (wt%)

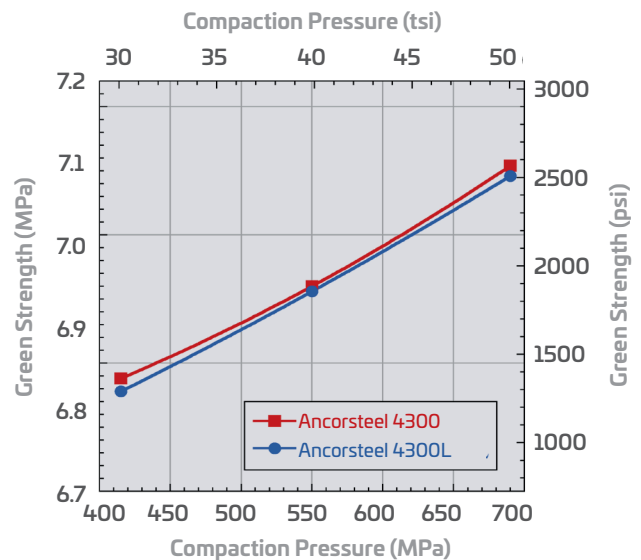
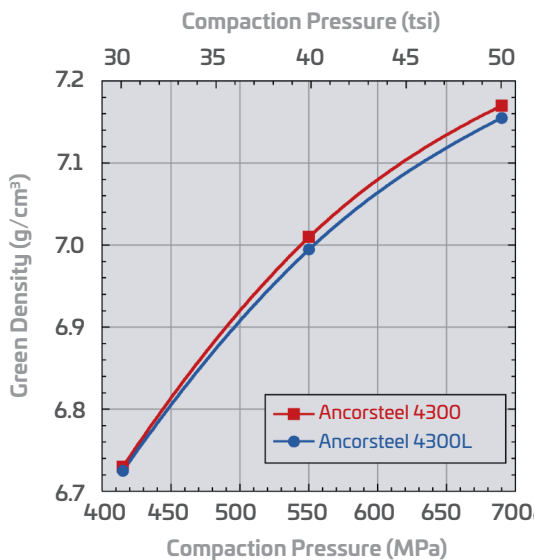
Alloy	Fe	Cr	Ni	Mo	Si	O
Ancorsteel 4300	Balance	1.0	1.0	0.8	0.6	0.1
Ancorsteel 4300L	Balance	1.0	1.0	0.3	0.6	0.1



Apparent Density: 3.1 g/cm³

Flow: 28s/50 g

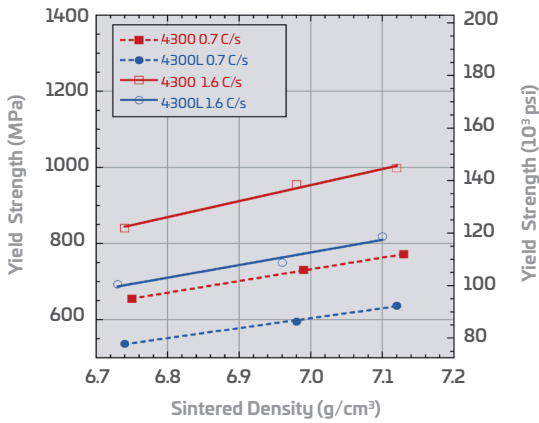
Effect of Compaction Pressure on Green Properties with 0.6% graphite and 0.75% ethylene bis-stearamide (EBS) lubricant; die heated to 60 °C (140 °F)



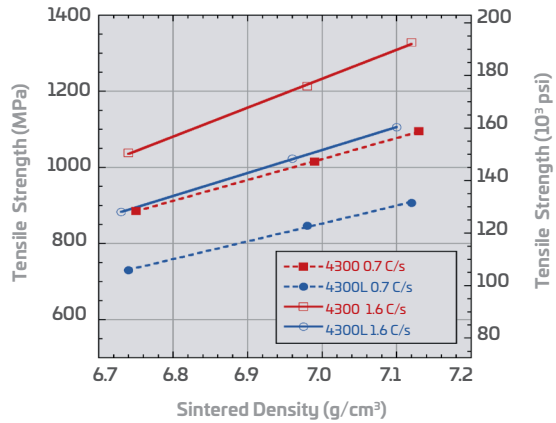
Effect of Density on Mechanical Properties

Samples sintered at 1250 °C (2285 °F) for 15 minutes at temperature in 90vol% N₂ – 10vol% H₂
 Average cooling rate 0.7 °C/s (1.3 °F/s) and 1.6 °C/s (2.9 °F/s) from 650 to 315 °C (1200 to 600 °F)
 Tempered at 205 °C (400 °F) for 1 hour

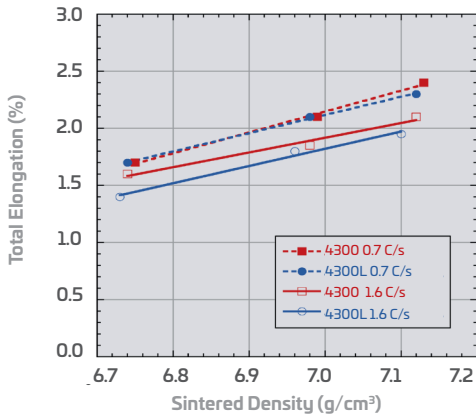
Yield Strength



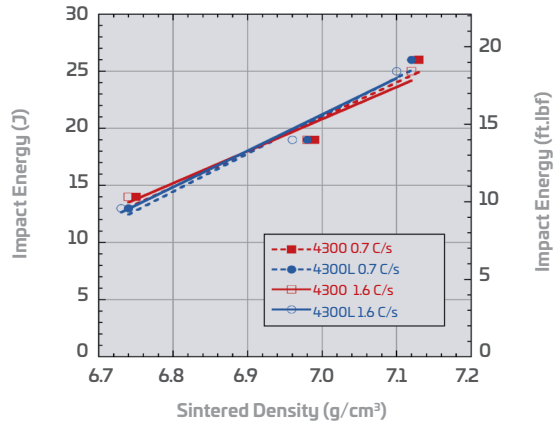
Tensile Strength



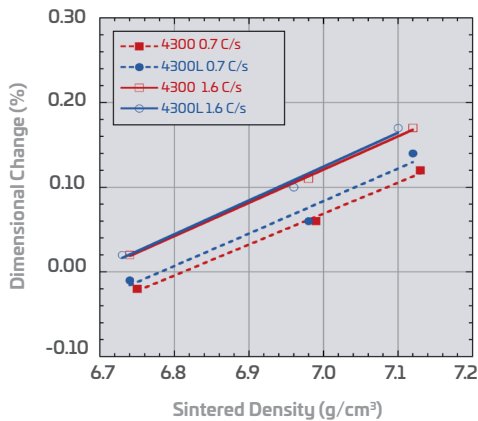
Elongation



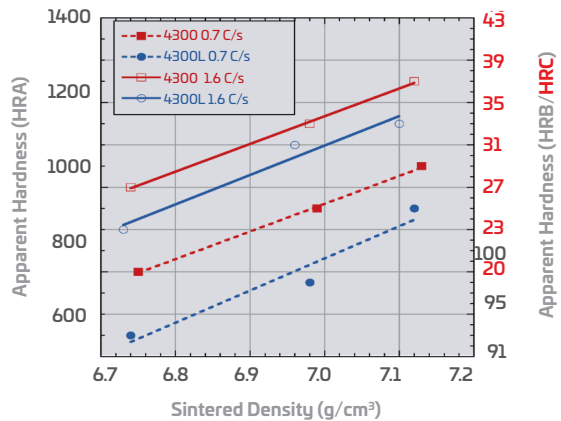
Impact Energy



Dimensional Change



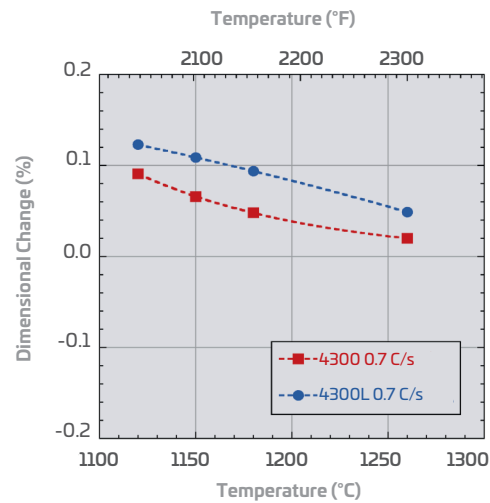
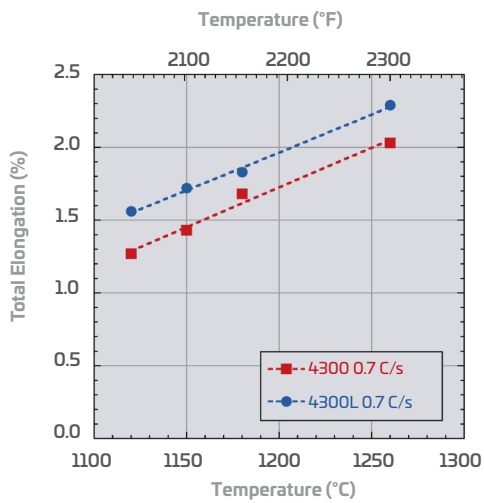
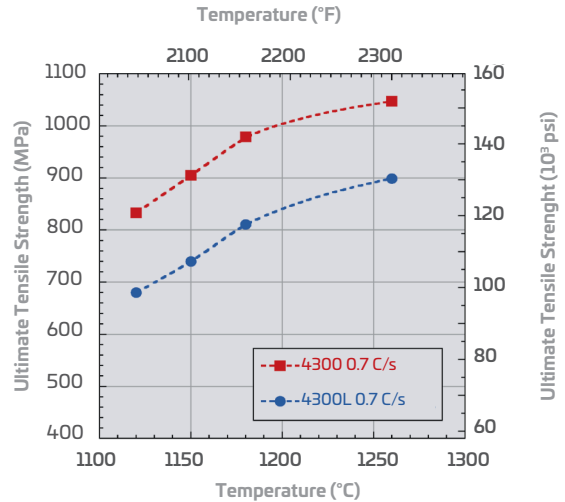
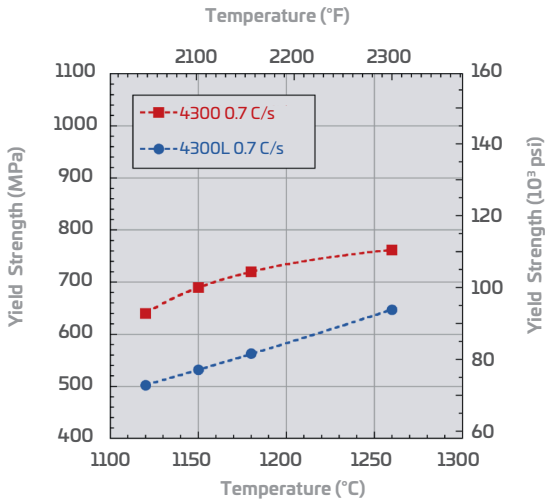
Hardness



Data generated with mixes containing 0.6% graphite

Effect of Sintering Temperature on Mechanical Properties

Samples sintered for 15 minutes at temperature in 90vol% N₂ – 10vol% H₂
 Average cooling rate 0.7 °C/s (1.3 °F/s) from 650 to 315 °C (1200 to 600 °F)
 Tempered at 205 °C (400 °F) for 1 hour



Data generated with mixes containing 0.6% graphite. Sintered density is 7.0 g/cm³.
 Further information on the effect of sintering temperature can be found in the Hoeganaes technical paper "Sintering of Chromium Containing PM Steels", MPIF 2008 Conference held in Washington DC