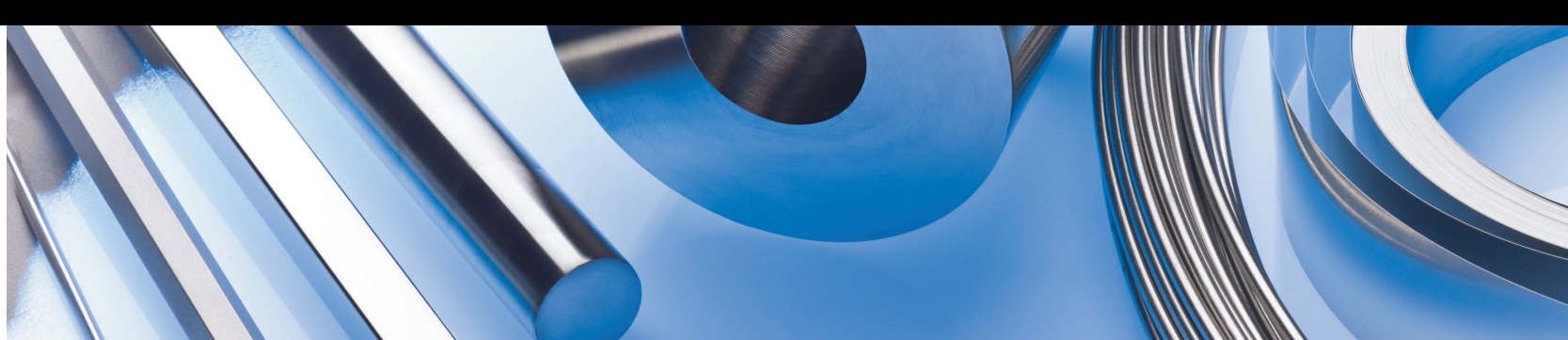


CarTech™ Ferrium® C64®

TYPICAL COMPOSITION

C	Cr	Ni	Co	Mo	W	V
0.11	3.5	7.5	16.3	1.75	0.2	0.02

CarTech Ferrium C64 is a premium quality carburizing steel that offers high core strength, high fatigue strength, high temperature resistance and high hardenability. It is double-vacuum VIM/VAR processed by vacuum induction melting followed by vacuum arc remelting to provide optimum metallurgical quality and repeatability. It can achieve carburized case hardness of 62-64 HRC (exceding that of conventional gear steels such as 8620 and 9310) and also provides ultra-high core properties for demanding shaft and gear applications. Its high tempering temperature (925°F) offers a 400-600°F increase in thermal stability relative to conventional gear steels. It was designed to benefit from low-pressure carburization at high temperature to reduce manufacturing time and expense while providing reliable carburization profiles. It is direct gas quenched using moderate pressures which reduces the amount of distortion and eliminates the need for a separate hardening/quenching process.

APPLICATIONS

Typical applications include power transmission shafts, gears and other demanding applications in the aerospace, energy and racing/off-road/mission-critical vehicles and other industries where weight savings, compactness, high temperature resistance and high surface fatigue resistance are valued. The ability of CarTech Ferrium C64 to achieve 62-64 HRC while also providing excellent core strength benefits highly-loaded components requiring wear and fatigue resistance.

MECHANICAL PROPERTY DATA

Test Temperature	Room Temperature
YS (ksi/MPa)	199/1372
UTS (ksi/MPa)	229/1579
% El (in 1")	18
% RA	75
Fracture Toughness (ksi√in/ MPa√m)	85/94

BENEFITS

- ▶ High Surface Hardness
- ▶ High Fatigue Strength
- ▶ High Temperature Resistance
- ▶ Corrosion Resistance

PRODUCT FORMS

Billets and bars

SPECIFICATIONS

AMS 6509

US Patent Number 8,801,872

PHYSICAL PROPERTIES

Density: 0.288 lb/in^3 (7.98 g/cm^3)

Mean Coefficient of Thermal Expansion

Temp Range		in/in/°F (x 10^{-6})	mm/mm/ °C (x 10^{-6})
°F	°C		
75-200	24-93	5.29	9.53
75-400	24-204	5.18	9.32
75-600	24-316	5.32	9.57
75-800	24-427	5.53	9.95
75-1000	24-538	5.69	10.25

CLEANLINESS REQUIREMENTS

CarTech Ferrium C64 VIM-VAR steel conforms to AMS 2300 magnetic particle cleanliness. The microcleanliness, rated according to ASTM E-45, typically satisfies the worst field ratings:

	A	B	C	D
Thin	1.5	1.5	1.5	1.5
Heavy	1.0	1.0	1.0	1.0

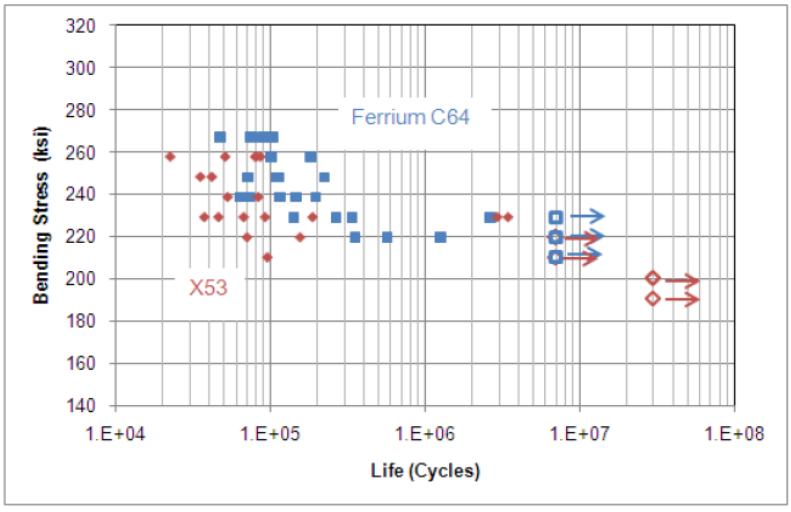
AVERAGE JOMINY END QUENCH HARDENABILITY

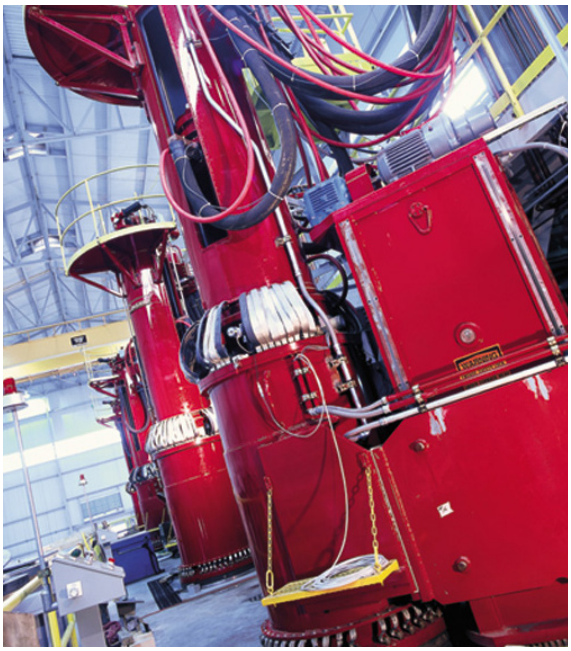
Distance from Quenched End (1/4 inch)								
	1	2	3	4	5	6	7	8
Rockwell C	43	43	43	43	43	43	42.5	42.5

CarTech Ferrium C64 is a secondary hardening steel that will increase hardness after tempering. (Typical hardness after tempering is 47-50 HRC.)

FATIGUE PROPERTY DATA

Single Tooth Bending Fatigue Property Data (Preliminary)





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