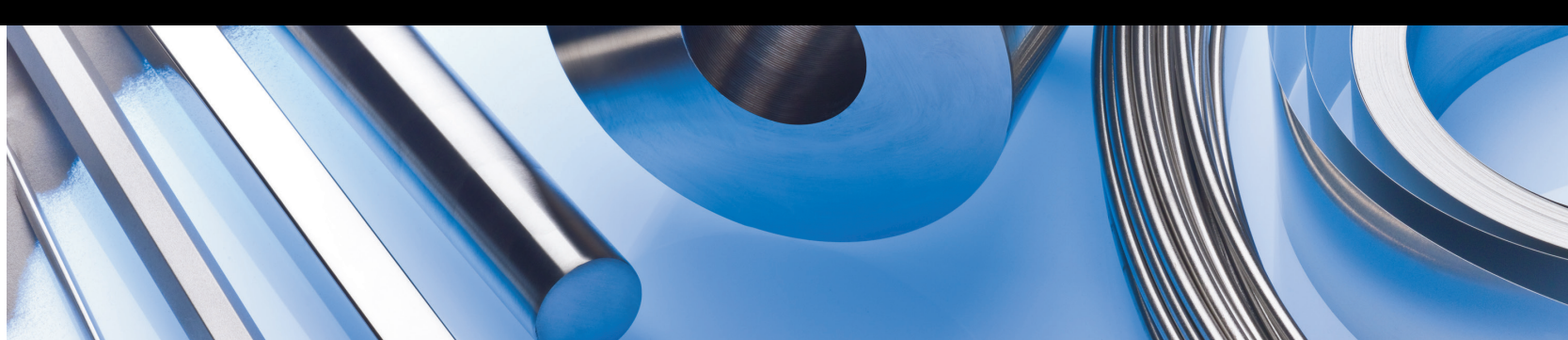


CarTech™ Ferrium® C61™

TYPICAL COMPOSITION

C	Cr	Ni	Co	Mo	V
0.15	3.5	9.5	18	1.1	0.08

CarTech Ferrium C61 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 60-62 HRC (comparable to conventional gear steels such as 8620 and 9310) but provides ultra-high core properties for demanding shaft and gear applications. Its high tempering temperature (900°F) offers a 400-600°F increase in thermal stability relative to conventional gear steels. It is well suited to 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 needs 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 high core strength and high hardenability of CarTech Ferrium C61 particularly benefits structual components such as shafts with integral gearing.

MECHANICAL PROPERTY DATA

Test Temperature	Room Temp.	400°F/ 204°C	600°F/ 316°C	800°F/ 427°C
YS (ksi/MPa)	225/1551	200/1379	195/1344	175/1207
UTS (ksi/MPa)	240/1655	220/1517	220/1517	200/1379
% El (in 1")	15	15	15	15
% RA	68	68	68	68
Fracture Toughness (ksi√in/ MPa√m)	130/143	-	-	-

BENEFITS

- ▶ High Fatigue Strength
- ▶ High Toughness
- ▶ High Temperature Resistance
- ▶ High Core Strength

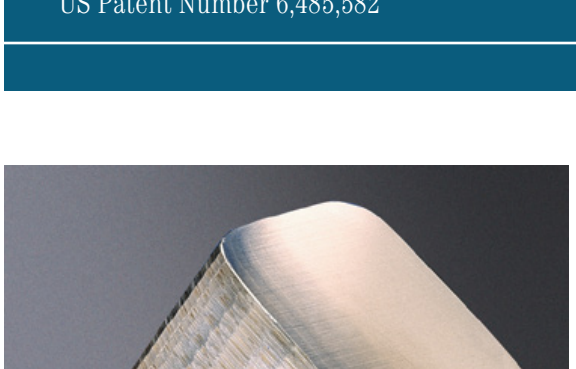
PRODUCT FORMS

Billets and bars

SPECIFICATIONS

AMS 6517

US Patent Number 6,176,946 B1
US Patent Number 6,635,126
US Patent Number 6,464,801
US Patent Number 6,485,582



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	5.30	9.54
75-400	24-204	5.33	9.59
75-600	24-316	5.98	10.76
75-800	24-427	6.16	11.09
75-1000	24-538	6.27	11.09

CLEANLINESS REQUIREMENTS

CarTech Ferrium C61 VIM-VAR steel conforms to AMS 2300 magnetic particle cleanliness. The microcleanliness, rated according to ASTM E-45, typically satisfies the worst field ratings:

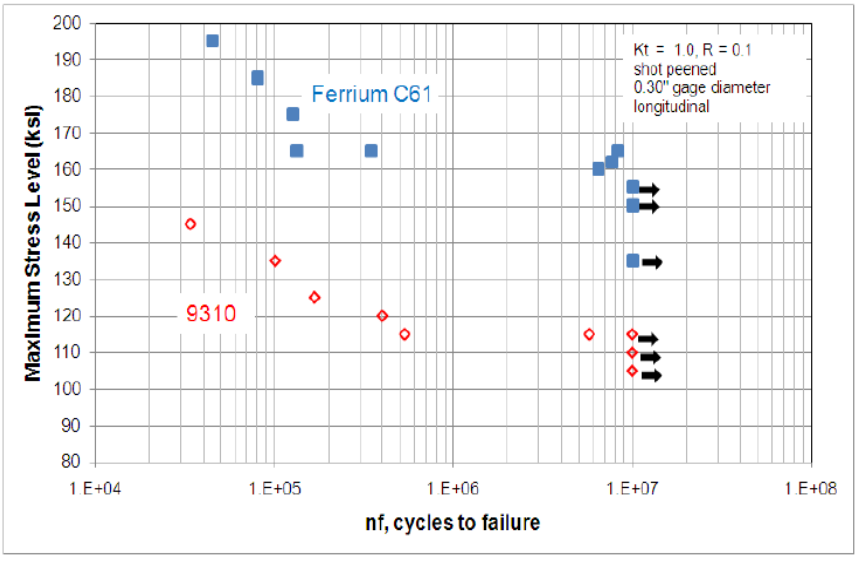
	A	B	C	D
Thin	1.5	1.5	1.5	1.5
Heavy	1.0	1.0	1.0	1.0

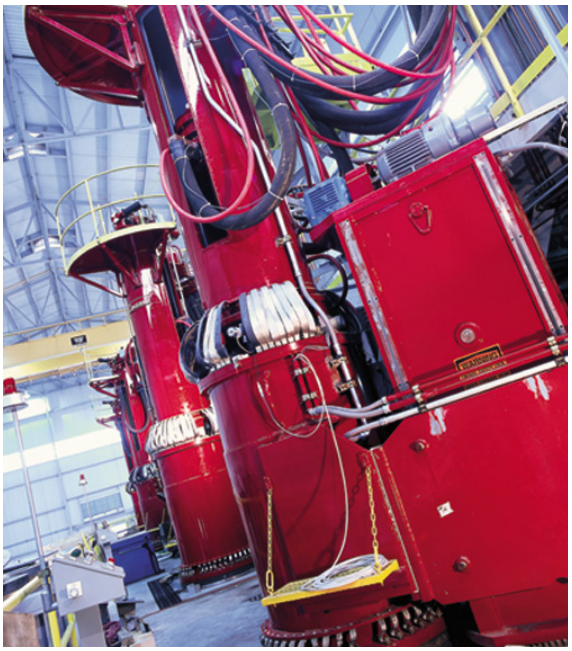
AVERAGE JOMINY END QUENCH HARDENABILITY

Distance from Quenched End (1/4 inch)								
	1	2	3	4	5	6	7	8
Rockwell C	45	45	44.5	44	44	44	44	44

CarTech Ferrium C61 is a secondary hardening steel that will increase hardness after tempering. (Typical hardness after tempering is 47-50 HRC.)

FATIGUE PROPERTY DATA





Contact:

Carpenter Technology Corporation
P.O. Box 14662
Reading, PA 19612-4662 USA

www.cartech.com
service@cartech.com

USA
TF: 800-654-6543
Tel: 610-208-2000

Canada
TF: 800-268-4740

England
Tel: +44-1527-512200

Europe
Belgium
Tel: +32-10-686-010

Mexico and South America
Querétaro
Tel: 52 (442) 29-09-04-001
Palmas
Tel: 52 (55) 50-03-02-33

Asia
Singapore
Tel: 65-6738-2401
China
Tel: 86-021-2411 3500
Fax: 86-021-2411 3555

Visit us at www.cartech.com