

26	27
Fe 55.845 Iron	Co 58.933194 Cobalt
23	41
V 50.9415 Vanadium	Nb 92.90637 Niobium

Hiperco® 50

Soft Magnetic Alloys



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DESCRIPTION

An iron-cobalt vanadium soft magnetic alloy with key properties of high magnetic saturation of 24 kilogauss while sustaining low core loss as compared to electrical steel. Hiperco® 50 is manufactured with a small amount of Niobium to control grain growth which allows for various levels of mechanical strength and magnetic properties.

APPLICATIONS

Magnetic bearings. Motors and generators for maximum torque density and minimum losses. For actuators (speaker, haptic, sensor devices) found in consumer electronic applications offers highest forces.

TYPICAL PHYSICAL PROPERTIES

Density	lb/in ³	0.293
Specific Gravity	68 F	8.12
*Curie Temperature	F	1720
	C	938
Electrical Resistivity (70 F)	ohm-cir mil/ft	241.0
	(21 C)	ohm-m
Elastic Modulus	ksi	30x10 ³
	GPa	206.8
Thermal Conductivity	BTU in/sq.ft/hr/ F	206.8
	W/m C	29.83
Mean Coefficient of Thermal Expansion	77 to 392 F	5.3x10 ⁻⁶ /°F
	77 to 752 F	5.6x10 ⁻⁶ length/length/ F
	77 to 1112 F	5.8x10 ⁻⁶ length/length/ F
	77 to 1472 F	6.3x10 ⁻⁶ length/length/°F

*Curie temperature is phase transition from magnetic to non-magnetic phase.

Source: Carpenter Electrification data sheet 5/20.

TYPICAL MECHANICAL PROPERTIES - 0.014 IN STRIP

HEAT TREATMENT	Cold Rolled Unannealed	Std Magnetic Anneal	Std Mechanical Anneal
Ultimate Tensile Strength	ksi (MPa) 190 (1310)	115 (792)	135 (930)
Yield Strength 0.2%	ksi (MPa) 175 (1270)	48 (331)	60 (414)
Elongation	% in 2 in. 2	5-15	5-15
Hardness	Rockwell C 36	**	**

Source: Carpenter Electrification data sheet 5/20.

TYPICAL DC MAGNETIC PROPERTIES

HEAT TREATMENT	COERCIVITY (A/m) from 8 kA/m	DC RELATIVE Permeability μ max	B (TESLA) A/m					
			400	800	1600	4000	8000	16000
0.014 IN STRIP								
Standard Ferromagnetic Anneal	40	19200	2.12	2.19	2.23	2.27	2.28	2.30
Standard Mechanical Anneal	125	7900	2.01	2.12	2.19	2.25	2.28	2.29
0.006 IN STRIP								
Standard Ferromagnetic Anneal	50	15000	2.03	2.14	2.21	2.27	2.28	2.30
Standard Mechanical Anneal	125	7400	1.99	2.11	2.18	2.25	2.28	2.29

Source: Carpenter Electrification data sheet 5/20.

FORMS | SIZES AVAILABLE

Strip | Coil 0.004" - 0.020"

Listed above are our standard stock items. Our inventory fluctuates based on market demands. If you do not see the size or form you require, please call us.

TYPICAL AC CORE LOSS BY HEAT TREATMENT

HEAT TREATMENT	0.014 IN STRIP SPECIFIC CORE LOSS			0.006 IN STRIP SPECIFIC CORE LOSS			B (TESLA)
	60 Hz	400 Hz	1000 Hz	60 Hz	400 Hz	1000 Hz	
	Standard Ferromagnetic Anneal	1.11 2.03 3.29	13.3 29.8 56.7	54.1 142.0 301.0	1.17 2.08 3.32	10.2 19.2 30.9	
Standard Mechanical Anneal	2.48 4.47 7.16	23.0 47.5 84.5	80.2 191.0 388.0	2.17 3.96 6.54	16.7 31.1 51.4	46.2 93.8 157.0	1.0 1.5 2.0

CHEMISTRY %

(Single figures are nominal except where noted.)

Cobalt 48.5, Vanadium 1.9, Niobium 0.05, Carbon 0.01, Iron Balance



SPECIFICATIONS

ASTM A801 Alloy Type 1 • MIL A 47182 • UNS R30005 Type 1

New Jersey Offices

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Need pricing? We're here to help:
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