

Hiperco® 50

Soft Magnetic Alloys

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	40.1x10 ⁻⁸
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

Special Purpose Alloys & Metals From Stock

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Special Purpose Alloys

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Controlled Expansion | Glass Sealing

Ed Fagan Inc. supplies the highest quality metals and alloys including materials from Carpenter Technology Corp.

Kovar® | ASTM F15 Alloy

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire
Trade Names: Kovar®, Pernifer® 2918, NILO K®, DilverP1®

Alloy 42/46/48/52

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire
Trade Names: Pernifer®40, 46, 48, 50; NILO® 42, 46, 48, 50; Glass Seal 42, 46, 48, 50

Free-Cut Invar "36"® Alloy

Forms: Round Bar, Wire

Invar "36"® Alloy

Forms: Plate, Sheet
Trade Names: Pernifer® 36, NILO® 36, Invar

Super Invar 32-5®

Forms: Plate, Round Bar, Sheet

Refractory Metals and Alloys

Ed Fagan Inc. is your leading source for quality refractory metals and alloys. We stock Tungsten, Molybdenum and its alloys in various forms and sizes manufactured from Plansee Group.

Molybdenum

Forms: Plate, Precision Cut Wire, Round Bar, Sheet/Strip, Spooled Wire, Threaded Rod/Nuts

Molybdenum Lanthanum Oxide (ML)

Forms: Sheet – Stress Relieved, Recrystallized

Molybdenum TZM

Forms: Plate, Round Bar

Niobium

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire

Rhenium

Forms: Plate, Round Bar, Sheet, Strip/Coil

Tantalum

Forms: Round Bar, Sheet

Tungsten

Forms: Parts (To Specification), Plate, Precision Cut Wire, Round Bar, Sheet

Tungsten Alloy

Blank Forms: Flats, Parts, Plate/Sheet, Rod, Shapes

Soft Magnetic Alloys | EMI Shielding & Laminations

Ed Fagan Inc. is a distributor of "EMI shielding alloys" for VDM Metals GmbH the world's leading producer of these alloys.

EFI Alloy 50

Forms: Round Bar, Square Bar, Strip/Coil, Wire
Trade Names: Alloy 4750, High Permeability 49®, Magnifer® 50

EFI Alloy 79

Forms: Rectangular Bar, Round Bar, Sheet, Strip/Coil, Wire
Trade Names: Hipernom, HyMu80®, Magnifer® 7904, Molypermalloy, Permalloy 80®

Hiperco® 50, Hiperco® 50A, Hiperco® 50 HS

Forms: Plate, Round Bar, Strip/Coil

Carpenter VimVar Core Iron

Forms: Plate, Round Bar

Electrical & Electronic Nickels

Ed Fagan Inc. supplies select, commercially pure grades of Nickel in various forms and sizes.

Electronic Nickels

200/201/205/233/270

Forms: Round Bar, Sheet, Strip/Coil, Wire

Alloys and Metals We Distribute

Corrosion Resistant Alloys • High-Temperature Alloys • Stainless Steel
• Titanium – CP, 6 Al-4V

Ed Fagan Inc. Services

Slitting, Shearing, Saw Cutting, Grinding, Water Jet Cutting, Laser Cutting,
Custom Stocking and Consignment Programs

JUST-IN-TIME DELIVERY: All of our **standard stock** items can be **shipped within 24-hours** of your order confirmation and most are **shipped the same day**. All materials certified with shipment. For special orders and non-stock materials, contact our sales team for our competitive pricing and delivery lead times.

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