

# Hiperco® 50 HS

## Soft Magnetic Alloys

### DESCRIPTION

An iron-cobalt-vanadium soft magnetic alloy that exhibits high magnetic saturation, high yield strength and moderate core loss. Niobium is added for grain refinement during mill processing and final heat treating to improve yield strength properties found in traditional Hiperco® 50.

### APPLICATIONS

In the manufacture of rotor laminations Hiperco 50 HS strip is applicable in aircraft power generation applications and for magnetic bearings. These laminations are stamped from cold rolled strip and must be final annealed in a protective atmosphere or vacuum environment at a temperature that provides both magnetic and mechanical properties that withstand the high stresses. High-speed motors.

### TYPICAL PHYSICAL PROPERTIES

Density	lb/in <sup>3</sup>	0.293
Specific Gravity	68° F	8.12
*Curie Temperature	°F	1720
	°C	938
Electrical Resistivity (70° F)	ohm-cir mil/ft	253.0
	(21° C)	ohm-m
Elastic Modulus	ksi	30x10 <sup>3</sup>
	GPa	206.8
Thermal Conductivity	Btu-in/hr/ft <sup>2</sup> /°F	206.8
	W/m /°C	29.83
Mean Coefficient of Thermal Expansion	77 to 392°F	5.3x10 <sup>-6</sup> length/length/°F
	77 to 752°F	5.6x10 <sup>-6</sup> length/length/°F
	77 to 1112°F	5.8x10 <sup>-6</sup> length/length/°F
	77 to 1472°F	6.3x10 <sup>-6</sup> length/length/°F

\*Curie temperature is phase transition from magnetic to non-magnetic phase.  
Source: Carpenter Electrification data sheet 5/20

### FORMS | SIZES AVAILABLE

Strip | Coil                      0.006" - 0.014"

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 MECHANICAL PROPERTIES - 0.006 IN STRIP

#### HEAT TREATMENT

TEMPERATURE		TIME, HR	0.2% YIELD STRENGTH		ULTIMATE TENSILE STRENGTH		ELONGATION IN 2 IN (50.8 MM)
°F	°C		ksi	MPa	ksi	MPa	%
1328	720	1	99	683	185	1280	15
1328	720	2	94	648	177	1220	14
1328	720	4	87	600	156	1080	11
1364	740	1	86	593	168	1160	13
1364	740	2	83	572	167	1150	13
1364	740	4	78	538	158	1090	12
1400	760	1	76	524	149	1030	11
1400	760	2	76	524	166	1140	14
1400	760	4	73	503	145	1000	11
1472	800	4	64	441	142	979	11

The tensile properties are for strips heat treated and tested at room temperature. All heat treatments conducted in batch type furnaces (1 hour heat up time) in dry hydrogen followed by cooling rate of 180°F/hr.  
Source: Carpenter Electrification data sheet 5/20

### TYPICAL DC MAGNETIC PROPERTIES

1.50 IN O.D. X 1.25 IN I.D. RING LAMINATIONS  
ASTM METHOD A596/A596M

0.2% YIELD STRENGTH		FLUX DENSITY AT INDICATED MAGNETIC FIELD STRENGTH									
		10 Oe 800 A/m		20 Oe 1600 A/m		50 Oe 4000 A/m		100 Oe 8000 A/m		200 Oe 16000 A/m	
ksi	MPa	kG	T	kG	T	kG	T	kG	T	kG	T
73	503	19.3	1.93	20.7	2.07	21.9	2.19	22.3	2.23	23.0	2.30
86	593	19.0	1.90	20.3	2.03	21.8	2.18	22.3	2.23	22.9	2.29
99	683	18.2	1.82	19.9	1.99	21.5	2.15	22.3	2.23	22.9	2.29

Source: Carpenter Electrification data sheet 5/20

### CHEMISTRY

% (Single figures are nominal except where noted.)

Cobalt 48.75, Vanadium 1.90, Niobium 0.30, Carbon 0.01, Iron Balance

### SPECIFICATIONS

ASTM A801 Alloy Type 1

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# Special Purpose Alloys & Metals From Stock

**efi** ED FAGAN INC.  
Special Purpose Alloys

www.edfagan.com | sales@edfagan.com

## 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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