

Hiperco® 50 HS

Soft Magnetic Alloys

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Capabilities Beyond Infinity

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Iron

Cobalt

Vanadium

Niobium

Hiperco® 50HS, 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 ³	0.293
Specific Gravity	68° F	8.12
Curie Temperature	°F °C	1720 938
Electrical Resistivity (70°F) (21°C)	ohm-cir mil/ft ohm-m	253.0 42.1
Elastic Modulus	ksi GPa	30 x 10 ³ 206.8
Thermal Conductivity	BTU in/sq.ft/hr/°F W/m °C	206.8 29.83
Mean Coefficient of Thermal Expansion	77 to 392°F 77 to 752°F 77 to 1112°F 77 to 1472°F	5.3 x 10 ⁻⁶ length/length/°F 5.6 x 10 ⁻⁶ length/length/°F 5.8 x 10 ⁻⁶ length/length/°F 6.3 x 10 ⁻⁶ length/length/°F

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

Forms | Sizes Available

Strip | Coil 0.006"-0.014"

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			0.2% Yield Strength		Ultimate Tensile Strength		Elongation in 2 in (50.8 mm)
°F	°C	Time, HR	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

0.2% Yield Strength

		10 0e 800 A/m		20 0e 1600 A/m		50 0e 4000 A/m		100 0e 8000 A/m		200 0e 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%, Balance: Iron



Specifications

ASTM A801 Alloy Type 1

1

EFINEA METALS | www.efineametals.com | sales@efineametals.com

Special Purpose Alloys & Metal From Stock

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EFINEA Services

Slitting, Shearing, Grinding, Water Jet Cutting, Laser Cutting, Saw 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

Controlled Expansion | Glass Sealing

EFINEA Supplies the highest quality metals and alloys including materials from Carpenter Technology Corp.

Kovar® | ASTM F15® Alloy

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

Trade Names: Kovar, Pernifer®, 2918, NILO K®, DilverP1®

Alloy 42 / 46 / 48 / 52

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

Trade Names: Pernifer®40, 46, 48, 50, NILO®42, 46, 48; Glass Sealing 42, 46, 48, 52

Free-Cut Invar "36"® Alloy

Forms: Round Bar/Rod

Invar "36" Alloy

Forms: Plate Sheet

Trade Names: Pernifer® 36, NILO®36, Invar

Super Invar 32-5®

Forms: Plate, Round Bar/Rod, Sheet

Refractory Metals & Alloys

EFINEA is your leading source for quality refractory metals & alloys. We stock DFARS Molybdenum, ML/MLS/MLR, Molybdenum TZM Tantalum & Tungsten manufactured from Plansee

Molybdenum

Forms: Plate, Round Bar/Rod, Sheet/Coiled Sheet, Threaded Rod/Nuts, Wire

Molybdenum Lanthanum Oxide (ML)

Forms: Sheet-Stress Relieved, Recrystallized

Molybdenum TZM

Forms: Plate, Round Bar/Rod, Sheet

Niobium

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

Rhenium

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

Tantalum

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

Tungsten

Forms: Plate, Precision Cut wire, Round Bar/Rod, Sheet

Tungsten Alloys

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

Soft Magnetic Alloys | EMI Shielding & Laminations

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

EFINEA Alloy 50

Forms: Round Bar/Rod, Square Bar, Strip/Coil, Wire Rod

Trade Names: High Permeability 49®, Mangnifer®50

EFINEA Alloy 79

Forms: Rectangular Bar, Round Bar/Rod, Sheet, Strip/Coil

Trade Names: Hipernom, HyMu80 Magnifer®7904, Molypermalloy, Permalloy 80®

Hiperco®50

Forms: Strip/Coil

Hiperco®50A

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

Hiperco®50 HS

Forms: Strip/Coil

Core Iron (Pure Iron)

Forms: Round Bar/Rod, Plate

Trade Names: Electrical Iron®, Alliedpureiron®

Electrical & Electronic Nickels

EFINEA supplies select, Commercially pure grades of Nickel in various forms and sizes.

Electronic Nickels

200/201/205/233/270

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

Copper Metals

EFINEA supplies select, Commercially pure grades of Copper in Coil Form

Copper OFHC 101/102

Nickel-Silver 770

Cupro-Nickel 715 (CuNi 70/30)

Forms: Coil

Stainless Steels & Other Alloys

EFINEA supplies select aircraft quality grades of Stainless Steel available in various forms and sizes.

17-4PH (Type 630)

15-5PH Vac Melt

300 Grade Stainless Steel Coils

Forms: Round Bar/Coils