

Hiperco® 50

Soft Magnetic Alloys

Request A Quote



EFINEA

Capabilities Beyond Infinity

1-800-348-6268 | efineametals.com



Hiperco® 50, 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 °C	1720 938
Electrical Resistivity (70°F) (21°C)	ohm-cir mil/ft ohm-m	241.0 40.1 x 10 ⁻⁸
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/°F14.0 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 0.004"-0.020"

Our inventory fluctuates based on market demands. If you do not see the size or form you require, please call us.

Typical Mechanical Properties

Heat Treatment		Cold Rolled Annealed	Soft Magnetic Anneal	Std Mechanical Anneal
Ultimate Tensile Strength	ksi (MPa)	190 (1310)	1115 (792)	1135 (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	B (TESLA) A/m					
		max	400	800	1600	4000	8000	16000
.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	2.30
.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.

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	13.3	54.1	1.17	10.2	33.9	1.0
	2.03	29.8	142.0	2.08	19.2	65.8	1.5
	3.29	56.7	301.0	3.32	30.9	109.0	2.0
Standard Mechanical Anneal	1.11	13.3	54.1	2.17	16.7	46.2	1.0
	2.03	29.8	142.0	3.96	31.1	93.8	1.5
	3.29	56.7	301.0	6.54	51.4	157.0	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

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

Special Purpose Alloys & Metal From Stock

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EFINEA Services

Slitting, Sheering, 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