



ED FAGAN INC.

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efi Alloy 79

Description: A soft magnetic alloy consisting of 80% Nickel, 5% Molybdenum, and balance Iron used where extremely high initial & maximum permeability and minimum hysteresis is needed.

Applications: Electro-magnetic shielding, specialty transformer laminations, toroidal tape wound cores, high quality motor laminations, stepping motors.

AKA: Magnifer 7904², Carpenter HyMu 80¹, Hipernom¹, Moly-Permalloy, Permalloy 80

efi Alloy 50

Description: A soft magnetic alloy, consisting of 49% Nickel, balance Iron used where high initial permeability, maximum permeability, and low core loss is needed.

Applications: Transformer cores, highly efficient motors, shielding, and specialized electronic devices, such as LF power transducers, chokes, relay parts, solenoids & oscillators.

AKA: Magnifer 50², Carpenter High Permeability 49¹, Alloy 4750

Hiperco 50¹

Description: An alloy of 49% Cobalt, and 2% Vanadium. This alloy exhibits the highest magnetic saturation of any commercial alloy and excels in applications where this attribute is needed. This alloy has higher mechanical strength than other soft magnetic alloys.

Applications: Electrical generators, pole pieces for electromagnets, magnetic bearings, and high magnetic flux devices and instruments.

Vim Var Core Iron

Description: Carpenter VIM VAR Core Iron is a low carbon magnetic iron produced using vacuum induction melting plus vacuum arc re-melting practices. Other elements commonly found in low carbon irons are held as low as possible to ensure good DC magnetic properties. This double melting technique controls the distribution of nonmetallic inclusions to a minimum length and frequency so that thin wall sections will not contain leaks due to internal discontinuities.

Soft Magnetic Alloys

Applications: Carpenter VIM VAR Core Iron is often used in the manufacture of soft magnetic components where vacuum integrity is needed such as in power tubes and microwave devices. In addition, relays, solenoids, and magnetic pole pieces for scientific instruments may be made utilizing the qualities of VIM VAR Core Iron.

AKA: Carpenter Consumet Core Iron¹

Radiometal 4550

Description: Radiometal 4550 is a Soft Magnetic Alloy consisting of 45% Nickel, balance iron alloy, and has excellent permeability with high saturation flux density.

Applications: Sensitive relays that need to respond to very weak currents. Radiometal 4550 is also widely used in transformers, chokes and special motors where the properties of silicon-iron do not provide the required magnetic performance.

Footnotes

1. Trademark Carpenter Technology Corp., Reading PA
2. Trademark ThyssenKrupp-VDM, Germany



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EFI also has a large inventory of Special Purpose Materials, Metals and Alloys for Refractory, Controlled Expansion and other Applications.

For customers outside of North America, contact
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TYPICAL DC MAGNETIC PROPERTIES

	EFI Alloy 79	EFI Alloy 50	Hiperco 50	Vim Var Core Iron	Radiometal 4550
Saturation Induction - Gauss	8,700	14,500	24,200	21,500	16,000
Minimum Mu Max Permeability	230,000	100,000	10,000	10,000	40,000
Coercive Force - Oersteds	0.015	0.06	0.4	1	
Coercive Force - A/m	1.19	4.77	31.83	79.58	8

TYPICAL AC MAGNETIC PROPERTIES

	EFI Alloy 79	EFI Alloy 50	Hiperco 50	Vim Var Core Iron
Core Loss W/lb @400Hz & 20k G	N/A	N/A	34	N/A
B-40 Permeability @60 Hz	45,000	6,500	N/A	N/A

N/A = not a typical application value

THE MATERIALS YOU NEED, WHEN YOU NEED THEM

Soft Magnetic Alloys

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Physical Properties	UNIT	EFI Alloy 79	EFI Alloy 50	Hiperco 50	Vim Var Core Iron	Radiometal 4550
Density	lb/cu in	0.316	0.295	0.293	0.284	0.30
Specific Gravity		8.74	8.18	8.12	7.86	-
Curie Temp	°F	860	840	715	1400	840
	°C	460	450	380	760	450
Melting Point	°F	2650	2600	2600	-	-
	°C	1454	1427	1427	-	-
Electrical Resistivity	micro-ohm-cm	59	49	41	13	45
	ohm-cir mil/ft	349	290	240	78	270
Thermal Conductivity	W/cm °C	0.35	0.13	0.29	0.73	0.13
	BTU-in/sq. ft-hr-°F	240	90	200	508	89
Specific Heat	Cal/g-°C	-	0.12	-	0.11	-
	BTU/lbm-°F	-	0.12	-	0.11	0.11
Mechanical Properties						
Tensile Strength	ksi	98	75	118	50	68
	MPa	676	518	814	345	470
Yield Strength	ksi	38	23	63	27	-
	MPa	262	159	435	190	-
Elongation	% in 2 in.	40	40	9	45	-
Typical Hardness	Rockwell	HRB 85	HRB 80	HRC 20	HRB 60	-
Modulus of Elasticity	Mpsi	31.4	24	30	30	24
	kMPa	217	166	207	207	-
Chemistry						
maximum % unless noted	Iron	Bal	Bal	Bal	99.8 nom.	Bal
	Nickel	80 nom.	49 nom.	-	0.08	45
	Cobalt	-	-	48 nom.	-	-
	Molybdenum	5.0 nom.	-	-	-	-
	Carbon	0.03	0.02	0.01	0.02	-
	Manganese	0.95	0.5	-	0.12	-
	Silicon	0.42	0.35	0.05	0.12	-
	Vanadium	-	-	2 nom.	0.05	-
	Niobium	-	-	0.05	-	-
	Phosphorus	0.02	-	-	0.01	-
	Sulfur	0.008	-	-	0.01	-
Specifications						
	ASTM	A753	A753	A801	A848	
	MIL	N-14411	N-14411	-	-	

FORMS AVAILABLE

	EFI Alloy 79	EFI Alloy 50	Vim Var Core Iron	Hiperco 50	High Perm 49FM	HyMu 80 Unannealed	High Perm 49 Rotor Gr	Radiometal 4550
Rod	0.500" - 1.875"	0.140" - 4.0"	0.500" - 6.0"	0.50" - 2.0"	-	-	-	0.625" - 1.57"
Sheet	0.010" - 0.125"	-	-	-	-	-	-	-
Strip / Coil	0.004" - 0.025"	0.004" - 0.062"	-	0.014" - 0.020"	-	0.006" - .014"	0.007" - 0.014"	0.015"
Square Bar	1.812"	1.030" - 2.030"	-	-	1.781" - 2.030"	-	-	-

If you do not see the size or form you required listed above please call us. New stock sizes and forms are added often.