

EFI Alloy 50

Soft Magnetic Alloys

26
Fe
55.845
Iron

28
Ni
58.6934
Nickel

DESCRIPTION

A soft magnetic nickel-iron alloy consisting of approximately 47-49% Nickel and the balance Iron. This alloy is applicable when extremely high permeability at low magnetizing forces are needed as it increases the efficiency and performance of magnetic devices. EFI Alloy 50 exhibits the highest saturation induction within the nickel-iron alloys. Trademark names for this alloy can be referenced by Magnifer® 50, Carpenter High Permeability® 49, Alloy 4750.

APPLICATIONS

Laminated cores for instrument transformers; Magnetic shields; Sensitive relay components; Solenoid components; LF power transducers; Chokes; Oscillators.

TYPICAL PHYSICAL PROPERTIES

Density	lb/cu in	0.295
Specific Gravity		8.18
Curie Temp	°F	860-930
	°C	460-499
Melting Range	°F	2600
	°C	1427
Electrical Resistivity 70° F (20°C)	ohm-cir mil/ft	290
	Microhm-cm	48
Thermal Conductivity	BTU-in/sq.ft-hr-°F	90.2
	W/m ·K	13
Mean Specific Heat	BTU/lb-°F	0.12
	J/kg ·K	502.41
Thermal Expansion	ppm/°F (75°F to 842°F)	5.0
	ppm/°C (25°C to 450°C)	9.0

Source: ASTM A753 | Carpenter Electrification High Permeability 49 Data Sheet v. 5/20

FORMS | SIZES AVAILABLE

Round Bar Rod (stress relief, anneal)	0.250" - 2.000"
Square Bar	1.003" - 2.030"
*Square Bar Free Machining	1.781" - 2.440"
**Strip/Coil	0.007" - 0.014"
* High Perm 49, **High Perm 49 Rotor Grade	

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

Tensile Strength	ksi	75
	MPa	518
Yield Strength	ksi	23
	MPa	159
Elongation	% in 2"	40
Typical Hardness Ann.	Rockwell HRB	80
Modulus of Elasticity	ksi	24
	MPa	166

Source: ASTM A753 | Carpenter Electrification High Permeability 49 Data Sheet v. 5/20

TYPICAL DC MAGNETIC PROPERTIES

PROPERTIES	BAR	STRIP (0.014 IN)
Initial Permeability B_{100}	6,500	12,000
Maximum Permeability	75,000	150,000
Coercive Force (Hc) ¹ /Oersted	0.04/0.07	0.05/0.06
Saturation Inductance (G) ²	15,000	15,000

¹ From 10,000 gaussies
² From H-100 oersteds

Source: Carpenter Electrification High Permeability 49 Data Sheet v. 5/20

TYPICAL AC MAGNETIC PROPERTIES

Minimum 60 Hz AC Permeability B40	8,000
Rotor Grade 0.014 IN Thickness	

All magnetic testing was performed in accordance with applicable ASTM specification. Please refer to appropriate specification for details. Procedures are product specific. Source: Carpenter Electrification High Permeability 49 Data Sheet v. 5/20

CHEMISTRY %

Nickel 47-49, Manganese 0.8 Max., Carbon 0.05 Max., Cobalt 0.5 Max., Silicon 0.5 Max., Iron Bal.
Source: ASTM A753

SPECIFICATIONS

AMS 7718 (Round Bar | Rod) • ASTM A753 Type 2 MIL N-14411C Comp 3 • UNS K94840

Special Purpose Alloys & Metals From Stock

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/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, 50;
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 and Alloys

Ed Fagan Inc. 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, Wire

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

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/Rod, Square Bar, Strip/Coil, Wire Rod
Trade Names: High Permeability 49®, Magnifer® 50

EFI 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

Carpenter VimVar Core Iron

Forms: Round Bar/Rod

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/Rod, 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.