

EFINEA ALLOY 50

Soft Magnetic Alloys

[Request A Quote](#)



EFINEA

Capabilities Beyond Infinity

1-800-348-6268 | efineametals.com

26

Fe

Iron

Ni

Nickel

EFINEA Alloy 50, 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. EFINEA Alloy 50 exhibits the highest saturation induction within the nickel-iron alloys. Trademark names for this alloy can be registered 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 °C	860-930 460-499
Melting Point	°F °C	2600 1427
Electrical Resistivity	ohm-cir mil/ft Microhms-cm	290 48
Thermal Conductivity	BTU-in/sq.ft-hr-°F/m-K	90.2 13
Mean Specific Heat	BTU/lb-°F J/kg-K	0.12 502.41
Thermal Expansion	ppm/°F (750°F to 842°F) ppm/°C (25°C to 450°C)	5.0 9.0

Forms | Sizes Available

Round Bar Rod	0.250" - 2.000"
Square Bar	1.003" - 2.030"
*Square Bar Free Machining	1.781" - 2.440"
**Strip/ Coil	0.010" - 0.080"
High Perm 49, ** High Perm 49 Rotor Grade	

Typical Mechanical Properties

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

Source: ASTM A753 | Carpenter Electrification high Permeability 49 Data sheet v. 5/20

Typical DC Magnetic Properties

Properties	Bar	Strip
Initial Permeability B_{100}	16,500	112,000
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 gauss

² From H=100 oersteds

¹ From 10,000 gauss ² From H=100 oersteds

Typical AC Magnetic Properties

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

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 & Metal From Stock

[Request A Quote](#)



EFINEA

Capabilities Beyond Infinity

1-800-348-6268 | efineametals.com



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