

Alloy 48

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26

Fe

Iron

28
Ni

Nickel

Alloy 48, A controlled expansion alloy consisting of approximately 48% Nickel and the balance Iron. This binary nickel-iron alloy is applicable to a wide variety of electronic applications that require a low coefficient of expansion at 400°C for glass-to-metal seals in soft lead or soda lime glasses. Alloy 48 is also referenced under the manufacturer's trademark names of Pernifer® 48 and NILO® 48.

APPLICATIONS

Glass-to-metal seals for electronic tubes and hermetic devices.

Typical Physical Properties

Density	lb/cu in	0.298
Specific Gravity		8.25
Curie Temp	°F °C	880 471
Melting Point	°F °C	2640 1450
Electrical Resistivity	ohm-cir mil/ft- (68°F) Microhms-cm- (20°C)	283 47
Thermal Conductivity	BTU-in/sq. ft-hr °F W/cm °C	116 16.7

Source: ASTM F30-96 (2017) Special Metals Corp. Nilo 48 Data

Forms | Sizes Available

Round Bar | Rod 0.062" - 4.000"

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 (MPa)	75 (520)
Yield Strength	ksi (MPa)	38 (260)
Elongation	% in 2 in.	43
Hardness Ann.	Rockwell HRB max.	80
Modulus of Elasticity	ksi (MPa)	23.2 (160)

Hot-rolled, annealed bar

Source: ASTM F30-96 (2017) Special Metals Corp Nilo 48 Data

Average Linear Coefficient of Thermal Expansion $\mu\text{m/m}^\circ\text{C}$

Temperature Range °C	48 Alloy UNS K94800
30 to 300	8.8
30 to 400	8.2 to 9.2*
30 to 450	9.4
30 to 500	9.6 to 10.3*
30 to 600	10.4
30 to 700	11.3
30 to 800	12.1
30 to 900	13.0
30 to 1000	13.9

Source: ASTM F30, -96(2017) Table X1, 48 Alloys; *ASTM F30-96 Table 2 Range

CHEMISTRY

Nickel 48 nom., Manganese 0.80 max., Silicon 0.30 max., Carbon 0.05 max., Chromium 0.25 max., Phosphorus 0.025 max., Sulfur 0.025 max., Aluminum 0.10 max., Bal. Iron. Cobalt is present as an incidental element and shall be reported separately.

Source: ASTM F30-96 (2017), Table 1, 48 Alloy



Specifications

ASTM F30 • AMS I-23011 CL 3 • MIL-I-23011 CL 3 • UNS K94800

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