

Alloy 42

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Controlled Expansion Alloys



Alloy 42, A controlled expansion alloy consisting of 41% Nickel, balance Iron; used in a wide variety of electronic applications, lead frames, especially for glass and ceramic seals. This alloy is also known as Pernifer® 42, NILO® 42, Carpenter Glass Sealing® 42.

APPLICATIONS

Glass-to-metal seals for a wide variety of electronic tubes, hermetic packages, automotive and industrial lamps.

Typical Physical Properties

Density	lb/cu in	0.293
Specific Gravity		8.12
Curie Temp	°F	716
	°C	380
Melting Point	°F	2600
	°C	1425
Electrical Resistivity	ohm-cir mil/ft	430
	Microhms-cm	71
Thermal Conductivity	BTU-in/sq. ft-hr °F	74.5
	W/cm °C	0.11
Specific Heat	BTU / lb °F	0.12

Typical Mechanical Properties

Tensile Strength	ksi (MPa)	75 (517)
Yield Strength	ksi (MPa)	40 (276)
Elgonation	% in 2 in.	30
Hardness Ann.	Rockwell B	76
Modulus of Electricity	ksi	21.5 x 10 ³

Average Linear Coefficient of Thermal Expansion $\mu\text{m}/\text{m}\cdot\text{°C}$

Temperature Range °C	Alloy 42 UNS K94100
30 to 300	4.0 to 4.7*
30 to 400	6.0
30 to 450	6.7 to 7.4*
30 to 500	7.9
30 to 600	9.6
30 to 700	10.5
30 to 800	11.4
30 to 900	12.3
30 to 1000	13.2

Source: ASTM F30, Table X1.1, UNS K94100; ASTM F30, Table 2

Forms | Sizes Available

Plate	0.1875" - 0.410"
Round Bar Rod	0.125" - 6.000"
Sheet	0.020" - 0.125"
Coiled Sheet	0.010" - 0.080"
Strip Coil Photo- Etch	0.0077" - 0.010"

CHEMISTRY

Nickel 41.0 nom., Bal. Iron

Source: ASTM F30 Table 1; 42 Alloy, UNS K94100



Specifications

ASTM F30 • AMS 1-23011 CL 5 • MIL-1-23011 CL 5 • UNS K94100

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, NILOK®, 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