

Free-Cut Invar

"36" Alloy

Controlled Expansion Alloys

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Free-Cut Invar "36"® Alloy is a free-machining nickel-iron alloy developed and produced by Carpenter® Technology. This alloy variation provides a slight increase in thermal expansion properties when compared to Invar. The addition of selenium to the chemistry delivers improved machinability for applications where high part productivity and good surface finish is important.

APPLICATIONS

For machined parts found in aircraft controls and electronic devices, whose dimensional changes due to temperature variation must be minimized.

Typical Physical Properties

Density	lb/in ³	0.291
Specific Gravity		8.05
Curie Temp	°F °C	535 280
Melting Point	°F	2600
Electrical Resistivity (70°F)	ohm-cir mil/ft	495.0
Thermal Conductivity	BTU-in/sq. ft-hr °F W/cm °C	72.6 10
Mean Specific Heat	BTU/lb/ °F	0.1230

Source: CarTech Free-Cut Invar "36" Alloy Data Sheet v.3/15/04

Forms | Sizes Available

Round Bar | Rod 0.125" - 6.00"

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	65 448	90 621
Yield Strength	ksi MPa	40 276	70 483
Reduction in Area	%	65	60
Elongation	% in 2 in.	35	20
Hardness	Rockwell B	70	90
Modulus of Electricity	ksi	20.5	21.5

Source: CarTech Free-Cut Invar "36" Alloy Data Sheet v. 3/15/04

Mean Coefficient of Thermal Expansion

Temperature 77°F to	Coefficient x 10 ⁻⁶ /°F	Temperature 25°C to	Coefficient x 10 ⁻⁶ /°C
212	0.91	100	1.64
302	1.32	150	2.38
392	1.69	200	3.04
482	2.34	250	4.21
572	3.26	300	5.87

Source: CarTech Free-Cut Invar "36" Alloy Data Sheet v.3/15/04

CHEMISTRY

Nickel, 36 nom., Selenium, 0.20 nom., Iron balance
Source: CarTech Free-Cut Invar "36" Alloy Data Sheet v.3/15/04



Specifications

ASTM F1684 • MIL S-16598B (chem only) • UNS K93050 • UNS K93602

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