

Fe
55.845

Iron

28

Ni

58.6934

Nickel

Free-Cut Invar "36"® Alloy

Controlled Expansion Alloys



1. 800.348.6268 | sales@efineametal.com
www.efineametal.com

DESCRIPTION

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 minimalized.

TYPICAL PHYSICAL PROPERTIES

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

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

		ANNEALED BARS	COLD DRAWN BARS
Tensile Strength	ksi	65	90
	MPa	448	621
Yield Strength	ksi	40	70
	MPa	276	483
Reduction in Area	%	65	60
Elongation	% in 2"	35	20
Hardness	Rockwell B	70	90
Modulus of Elasticity	ksi	20.5	21.5

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

MEAN COEFFICIENT OF THERMAL EXPANSION

Temperature	Coefficient	Temperature	Coefficient
77°F to	x 10 ⁻⁶ /°F	25°C to	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

New Jersey Offices

769 Susquehanna Avenue, Franklin Lakes, NJ 07417

3 Fir Court, Oakland, NJ 07436

Need pricing? We're here to help:

sales@efineametal.com

1.800.348.6268

California Offices

10537 Humboldt Street, Los Alamitos, CA 90720

1847 W. Business Center Drive, Orange, CA 92867

Special Purpose Alloys & Metals From Stock



1. 800.348.6268 | sales@efineametals.com
www.efineametals.com

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 I Glass Sealing

EFINEA supplies the highest quality metals and alloys including materials from Carpenter Technology Corp.

Kovar® I 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

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, 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 I 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®, Magnifer® 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

Carpenter VimVar Core Iron

Forms: Round Bar/Rod

Allied pure Iron

Forms: Round Bar/Rod

Electrical & Electronic Nickels

EFINEA 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

Copper Metals

EFINEA supplies select, commercially pure grades of Copper available in Coil form.

Copper OFHC 101/102

Nickel-Silver 770

Cupro-Nickel 715 (CuNi 70/30)

Forms: Coil

Alloys and Metals We Distribute

Corrosion Resistant Alloys · High-Temperature Alloys
Stainless Steel · Titanium – CP, 6 Al-4V

EFINEA Services

Slitting, Shearing, Saw Cutting,
Grinding, Water Jet Cutting, Laser Cutting,
Custom Stocking and Consignment Programs



New Jersey Offices

769 Susquehanna Avenue, Franklin Lakes, NJ 07417
3 Fir Court, Oakland, NJ 07436

Need pricing? We're here to help:
sales@efineametals.com
1.800.348.6268

California Offices

10537 Humboldt Street, Los Alamitos, CA 90720
1847 W. Business Center Drive, Orange, CA 92867