

26  
**Fe**  
55.845  
Iron

28  
**Ni**  
58.6934  
Nickel

27  
**Co**  
58.933194  
Cobalt

# Super Invar 32-5 Alloy

## Controlled Expansion Alloys

www.edfagan.com | sales@edfagan.com  
toll free 800.348.6268

### DESCRIPTION

An austenitic, magnetic iron-nickel-cobalt alloy consisting of 32% nominal Nickel, 5% Cobalt and the balance iron. Super Invar 32-5 provides thermal expansion rates approximately less than half of Invar (36% nickel-iron) when used in the -67/203°F temperature range. The slightly narrower application temperature range is due to a lower Curie temperature.

### APPLICATIONS

In structural components, support and substrates requiring precision measurements such as optical and laser systems, telescopes, laser bench tops, and ring gyroscopes.

### TYPICAL PHYSICAL PROPERTIES

Density	lb/cu in	0.294
Specific Gravity		8.15
Curie Temp	°F	500
	°C	260
Poisson's Ratio		0.230
Electrical Resistivity (73°F)	ohm-cir mil/ft	481.3
	microhm-cm	80
Thermal Conductivity	BTU-in/sq.ft-hr°F	72.6
	W/m°C	10
Specific Heat	Cal/g°C	0.12

Source: ASTM F1684/CarTech Super Invar 32-5 data sheet v. 3/15/04/CarTech Low Expansion Alloys Brochure

### FORMS | SIZES AVAILABLE

Plate	0.38" - 2.00"
Round Bar   Rod	0.50" - 3.543"
Sheet	0.0394" - 0.1181"

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

Tensile Strength	ksi	70
	MPa	483
Yield Strength (0.2%)	ksi	40
	MPa	276
Elongation	% in 2"	40
Hardness - Annealed	Rockwell B	75
Modulus of Elasticity	ksi	21.0 x 10 <sup>3</sup>

Source: CarTech Super Invar 32-5 data sheet v. 3/15/04

### AVERAGE COEFFICIENT OF THERMAL EXPANSION-ANNEALED

Temperature Range, °C Heat Treatment 30°C to	UNS NO. K93500 871 °C, 1 h, Furnace Cool µm/m°C
100	0.84
150	1.17
200	1.72
250	2.53
300	4.16
350	5.74
400	7.03
500	8.99
600	10.56
700	11.56
800	12.21
900	12.96

Source: ASTM F1684 X2.1

### CHEMISTRY %

Nickel 32.0 Nom., Cobalt 5.0 Nom., Iron Balance Nom.  
Source: ASTM F1684

### SPECIFICATIONS

ASTM F1684 • UNS K93500



# Special Purpose Alloys & Metals From Stock

**efi** ED FAGAN INC.  
Special Purpose Alloys

www.edfagan.com | sales@edfagan.com

## Controlled Expansion | Glass Sealing

Ed Fagan Inc. supplies the highest quality metals and alloys including materials from Carpenter Technology Corp.

### Kovar® | ASTM F15 Alloy

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire  
Trade Names: Kovar®, Pernifer® 2918, NILO K®, DilverP1®

### Alloy 42/46/48/52

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire  
Trade Names: Pernifer®40, 46, 48, 50; NILO® 42, 46, 48, 50; Glass Seal 42, 46, 48, 50

### Free-Cut Invar "36"® Alloy

Forms: Round Bar, Wire

### Invar "36"® Alloy

Forms: Plate, Sheet  
Trade Names: Pernifer® 36, NILO® 36, Invar

### Super Invar 32-5®

Forms: Plate, Round Bar, Sheet

## Refractory Metals and Alloys

Ed Fagan Inc. is your leading source for quality refractory metals and alloys. We stock Tungsten, Molybdenum and its alloys in various forms and sizes manufactured from Plansee Group.

### Molybdenum

Forms: Plate, Precision Cut Wire, Round Bar, Sheet/Strip, Spooled Wire, Threaded Rod/Nuts

### Molybdenum Lanthanum Oxide (ML)

Forms: Sheet – Stress Relieved, Recrystallized

### Molybdenum TZM

Forms: Plate, Round Bar

### Niobium

Forms: Plate, Round Bar, Sheet, Strip/Coil, Wire

### Rhenium

Forms: Plate, Round Bar, Sheet, Strip/Coil

### Tantalum

Forms: Round Bar, Sheet

### Tungsten

Forms: Parts (To Specification), Plate, Precision Cut Wire, Round Bar, Sheet

### Tungsten Alloy

Blank Forms: Flats, Parts, Plate/Sheet, Rod, Shapes

## Soft Magnetic Alloys | EMI Shielding & Laminations

Ed Fagan Inc. is a distributor of "EMI shielding alloys" for VDM Metals GmbH the world's leading producer of these alloys.

### EFI Alloy 50

Forms: Round Bar, Square Bar, Strip/Coil, Wire  
Trade Names: Alloy 4750, High Permeability 49®, Magnifer® 50

### EFI Alloy 79

Forms: Rectangular Bar, Round Bar, Sheet, Strip/Coil, Wire  
Trade Names: Hipernom, HyMu80®, Magnifer® 7904, Molypermalloy, Permalloy 80®

### Hiperco® 50, Hiperco® 50A, Hiperco® 50 HS

Forms: Plate, Round Bar, Strip/Coil

### Carpenter VimVar Core Iron

Forms: Plate, Round Bar

## Electrical & Electronic Nickels

Ed Fagan Inc. supplies select, commercially pure grades of Nickel in various forms and sizes.

### Electronic Nickels

200/201/205/233/270

Forms: Round Bar, Sheet, Strip/Coil, Wire

## Alloys and Metals We Distribute

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

## Ed Fagan Inc. Services

Slitting, Shearing, Saw Cutting, Grinding, Water Jet Cutting, Laser 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.

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