



**ED FAGAN INC.**

# Alloy 42

# Controlled Expansion Alloys



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## DESCRIPTION

A controlled expansion alloy, consisting of 42% Nickel, balance Iron; used in a wide variety of electronic application, lead frames, especially for glass and ceramic seals.

## APPLICATIONS

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

AKA: Pernifer 40<sup>2</sup>, NILO 42<sup>3</sup>, Glass Seal 42<sup>1</sup>

Footnotes: 1. Trademark Carpenter Technology Corp., Reading PA, 2. Trademark ThyssenKrupp-VDM, Germany, 3. Trademark Special Metals Corporation, USA

## PHYSICAL PROPERTIES

Density	lb/cu in	0.293
Specific Gravity		8.12
Curie Temp	°F	716
	°C	380
Melting Point	°F	2600
	°C	1427
Electrical Resistivity	micro-ohm-cm	68
	ohm-cir mil/ft	400
Thermal Conductivity	W/cm °C	0.11
	BTU-in/sq. ft-hr-°F	74.5
Specific Heat	Cal/g-°C	0.12
	BTU-lbm-°F	0.12
Thermal Expansion	ppm/°F(75°F to 842°F)	3.9
	ppm/°C(25°C to 450°C)	7.0

## SPECIFICATIONS

**ASTM** F-30    **MIL** I-23011 Cl 5    **AMS** I-23011 Cl 5

## LINEAR COEFFICIENT OF THERMAL EXPANSION - (ppm per °C) Deg. °C Class 1

30-100	4.8	30-375	5.5	30-550	8.8
30-150	4.6	30-400	6.0	30-600	9.5
30-200	4.5	30-425	-	30-700	10.5
30-250	4.5	30-450	6.7-7.4	30-800	11.4
30-300	4.0-4.7	30-475	-	30-900	12.3
30-325	4.7	30-500	8.0	30-1000	13.2
30-350	5.0	30-525	-		



## MECHANICAL PROPERTIES

Tensile Strength	ksi	82
	MPa	566
Yield Strength	ksi	34
	MPa	235
Elongation	% in 2 in.	30
Typical Hardness Ann.	Rockwell	HRB 80
Modulus of Elasticity	Mpsi	21.5
	kMPa	148



## CHEMISTRY - maximum % unless noted

Iron	Bal	Silicon	0.30
Nominal Nickel	41	Sulfur	0.025
Nominal Cobalt	-	Chromium	0.025
Carbon	0.05		

## FORMS AVAILABLE

Sheet - Annealed	0.508mm - 2.540mm
Plate - Annealed	6.858mm
Strip/Coil	0.254mm - 1.016mm
Rod	Made to Size

Strip/Coil can be slit to customer requirements down to 4mm widths.



Ed Fagan Inc also specializes in locating exotic materials. So, if you can't locate that hard-to-find material you need... Put EFI's material locator service to work for you!

[www.material-locator.com](http://www.material-locator.com)

**THE MATERIALS YOU NEED,  
WHEN YOU NEED THEM**



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## Glass Sealing/ Controlled Expansion Alloys

EFI provides the highest quality materials including materials from Carpenter Technology Corp.

### ASTM F15 Alloy:

aka Kovar & Pernifer 2918  
Coil/Strip, Sheet, Plate,  
Bar, Wire

### Invar 36:

Bar, Sheet, Plate

### 42/46/48/52 Alloy:

Coil/Strip, Sheet, Plate, Bar

### Electronic Nickel

### 200/201/233/270:

Coil/Strip, Rod, Sheet, Plate

## Soft Magnetic Alloys/ EMI Shielding & Laminations

EFI is a distributor of magnetic shielding alloys for the world's leading producer of these alloys – ThyssenKrupp VDM.

### EFI Alloy 79: aka Magnifer 7904,

Moly-Permalloy & HyMu 80  
Sheet, Coil/Strip

### EFI 50:

aka Magnifer 50 & High Perm 49  
Bar, Coil/Strip

### Carpenter VimVar Core Iron:

Rod, Bar

### Carpenter Hiperco 50:

Coil/Strip, Billet

**Radiometal 4550:** Rod, Coil/Strip

## Refractory Metals/Alloys

EFI is a stocking distributor of Molybdenum & Tungsten products, as well as many other refractory metals and alloys, providing the highest quality materials available.

### Molybdenum:

Bar, Sheet, Plate, Coil/Strip

### TZM Molybdenum Alloy:

Sheet, Bar

### Tungsten:

Bar, Coil/Strip, Sheet

**Tantalum:** Sheet, Tubing

**Niobium:** Strip

**Tungsten Alloy:** Rod, Shapes

**Rhenium:** Sheet

## Hard-to-Find Special Purpose Metals, Alloys and Materials

Are you spending too much of your valuable time trying to locate suppliers of specialty metals and materials? Use EFI's Material Locator (see below) to source it for you so you can get back to doing what you do best.

- Coil/Strip
- Sheet
- Plate
- Rod
- Tube
- Pipe
- Wire

## JUST IN TIME DELIVERY

All standard stock items can be **shipped within 24 hours** – and are often **shipped the same day**. All materials are certified with shipment.

## METALS WE DISTRIBUTE

Titanium  
Zirconium

High Temperature Alloys  
Corrosion Resistant Alloys  
Stainless Steel

Copper – OFE, OFHC  
Brass & Bronze  
Beryllium Copper

## SERVICES WE OFFER

Slitting, Shearing, Saw Cutting, Centerless Grinding, Water-jet Cutting, Laser Cutting,  
Custom Stocking Programs • Consignment Programs



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