



ED FAGAN INC.

Alloy 46

Controlled Expansion Alloys



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DESCRIPTION

A controlled expansion alloy, consisting of 46% Nickel, balance Iron; used in a variety of electronic applications, especially for glass and ceramic seals.

APPLICATIONS

Glass to metal seals for electronic tubes and hermetic devices.

AKA: Pernifer 46², NILO 46, Glass Seal 46¹

Footnotes: 1. Trademark Carpenter Technology Corp., Reading PA,
2. Trademark ThyssenKrupp-VDM, Germany

MECHANICAL PROPERTIES

Tensile Strength	<i>ksi</i>	80
	<i>MPa</i>	552
Yield Strength	<i>ksi</i>	35
	<i>MPa</i>	242
Elongation	<i>% in 2 in.</i>	30
Typical Hardness Ann.	<i>Rockwell</i>	HRB 80
Modulus of Elasticity	<i>Mpsi</i>	23
	<i>kMPa</i>	159

CHEMISTRY - maximum % unless noted

Iron	Bal	Silicon	0.30
Nominal Nickel	46	Sulfur	0.025
Nominal Cobalt	-	Chromium	0.025
Carbon	0.05		

PHYSICAL PROPERTIES

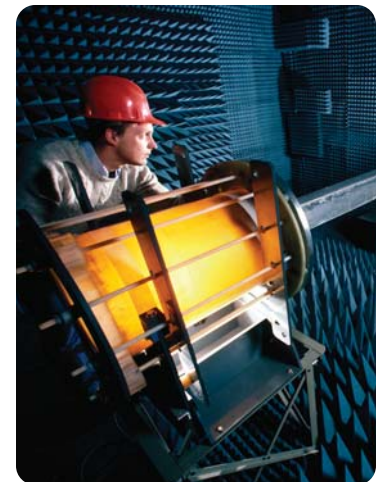
Density	<i>lb/cu in</i>	0.295
Specific Gravity		8.17
Curie Temp	<i>°F</i>	860
	<i>°C</i>	460
Melting Point	<i>°F</i>	2600
	<i>°C</i>	1427
Electrical Resistivity	<i>micro-ohm-cm</i>	47
	<i>ohm-cir mil/ft</i>	277
Thermal Conductivity	<i>W/cm °C</i>	0.11
	<i>BTU-in/sq. ft-hr-°F</i>	79.2
Specific Heat	<i>Cal/g-°C</i>	0.12
	<i>BTU-lbm-°F</i>	0.12
Thermal Expansion	<i>ppm/°F(75°F to 842°F)</i>	4.4
	<i>ppm/°C(25°C to 450°C)</i>	7.9

SPECIFICATIONS

ASTM F-30 **MIL** I-23011 CI 4 **AMS** I-23011 CI 4

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

30-100	8.2	30-375	7.5	30-550	9.3
30-150	8.1	30-400	7.5	30-600	9.8
30-200	7.9	30-425	7.6	30-700	10.7
30-250	7.8	30-450	7.9	30-800	11.6
30-300	7.5	30-475	-	30-900	12.5
30-325	-	30-500	8.2-8.9	30-1000	13.4
30-350	7.1-7.8	30-525	-		



FORMS

Rod • Sheet • Plate • Coil/Strip • Photo-Etch

*Please call us with your size, shape, form, and quantity requirements for a material price quote.



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

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



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efi
ED FAGAN INC.

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 Hipercor 50:

Coil/Strip, Billet

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

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
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Corrosion Resistant Alloys
Stainless Steel

Copper – OFE, OFHC
Brass & Bronze
Beryllium Copper

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