



ED FAGAN INC.

Alloy 48

Controlled Expansion Alloys



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DESCRIPTION

A controlled expansion alloy, consisting of 48% Nickel, balance Iron; used in a variety of electronic application, especially for glass and ceramic seals.

APPLICATIONS

Glass to metal seals for variety of electronic tubes and hermetic devices.

AKA: Pernifer 48², NILO 48, Glass Seal 48¹

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

PHYSICAL PROPERTIES

| | | |
|------------------------|-----------------------|-------|
| Density | lb/cu in | 0.298 |
| Specific Gravity | | 8.25 |
| Curie Temp | °F | 880 |
| | °C | 471 |
| Melting Point | °F | 2600 |
| | °C | 1427 |
| Electrical Resistivity | micro-ohm-cm | 49 |
| | ohm-cir mil/ft | 290 |
| Thermal Conductivity | W/cm °C | 0.13 |
| | BTU-in/sq. ft-hr-°F | 90 |
| Specific Heat | Cal/g-°C | 0.12 |
| | BTU-lbm-°F | 0.12 |
| Thermal Expansion | ppm/°F(75°F to 842°F) | 5.0 |
| | ppm/°C(25°C to 450°C) | 9.0 |

SPECIFICATIONS

ASTM F-30 **MIL** I-23011 CI 3 **AMS** I-23011 CI 3

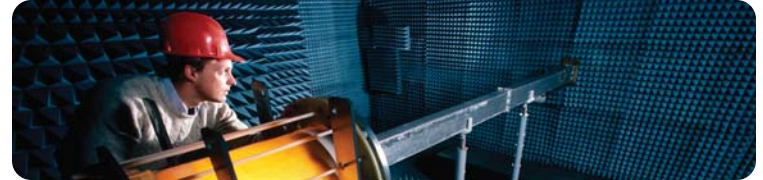
LINEAR COEFFICIENT OF THERMAL EXPANSION - (ppm per °C) Deg. °C Class 1

| | | | | | |
|--------|-----|--------|---------|---------|----------|
| 30-100 | 9.4 | 30-375 | - | 30-550 | 9.6-10.3 |
| 30-150 | 9.4 | 30-400 | 8.2-9.2 | 30-600 | 10.4 |
| 30-200 | 9.4 | 30-425 | 8.9 | 30-700 | 11.3 |
| 30-250 | 9.3 | 30-450 | 9.0 | 30-800 | 12.1 |
| 30-300 | 8.8 | 30-475 | 9.3 | 30-900 | 13.0 |
| 30-325 | - | 30-500 | 9.4 | 30-1000 | 13.9 |
| 30-350 | 9.0 | 30-525 | - | | |



MECHANICAL PROPERTIES

| | | |
|-----------------------|------------|--------|
| Tensile Strength | ksi | 79 |
| | MPa | 545 |
| Yield Strength | ksi | 36 |
| | MPa | 248 |
| Elongation | % in 2 in. | 30 |
| Typical Hardness Ann. | Rockwell | HRB 80 |
| Modulus of Elasticity | Mpsi | 23 |
| | kMPa | 159 |



CHEMISTRY - maximum % unless noted

| | | | |
|----------------|------|----------|-------|
| Iron | Bal | Silicon | 0.30 |
| Nominal Nickel | 48 | Sulfur | 0.025 |
| Nominal Cobalt | - | Chromium | 0.025 |
| Carbon | 0.05 | | |

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
- Sheet
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- Rod
- Tube
- Pipe
- Wire

JUST IN TIME DELIVERY

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METALS WE DISTRIBUTE

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Zirconium

High Temperature Alloys
Corrosion Resistant Alloys
Stainless Steel

Copper – OFE, OFHC
Brass & Bronze
Beryllium Copper

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