

74

**W**  
183.84

Tungsten

29 Cu 63.546 Copper	26 Fe 55.845 Iron	28 Ni 58.6934 Nickel
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# Tungsten Alloys

## Refractory Metals and Alloys

### DESCRIPTION

The element Tungsten (W) is quite brittle and difficult to machine, but with the addition of nickel, copper and/or iron, a group of alloys are produced that are machinable with enhanced engineering properties. Designed to be used where a concentrated mass in a limited space is required, these heavy metal Tungsten Alloys are manufactured using powder metallurgy techniques to produce an alloy that is twice as heavy as steel and 50% more dense than lead. Overall their mechanical properties; hardness, tensile strength and ductility compare favorably to steel. These alloys also have an excellent oxidation resistance and can be plated or painted for enhanced corrosion protection.

### APPLICATIONS

Tungsten Alloys have found wide acceptance in applications such as aircraft counterbalance weights, gyro weights, down hole well logging casings and weights for the oil and gas industry, high energy radiation shielding for the medical and nuclear industry.

### TYPICAL TUNGSTEN ALLOYS PROPERTIES

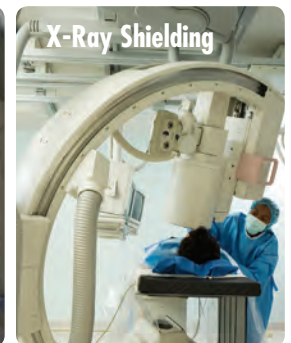
EFI GRADE	ASTM B777-15 Class	Nominal Tungsten (wt %)	Nominal Density g/cc	Minimum Yield Strength ksi (MPa)	Minimum Ultimate Tensile Strength ksi (MPa)	Minimum Elongation %	Modulus of Elasticity ksi (MPa)	Class Hardness Rockwell "C" Max
EF 17	1	90.0	17.0	75 (517)	110 (758)	5	45 (310)	32
EF 17N*	1	90.0	17.0	75 (517)	94 (648)	2	45 (310)	32
EF175	2	92.5	17.5	75 (517)	110 (758)	5	48 (331)	33
EF 175N*	2	92.5	17.5	75 (517)	94 (648)	2	48 (331)	33
EF 18	3	95.0	18.0	75 (517)	105 (724)	3	50 (345)	34
EF 18N*	3	95.0	18.0	75 (517)	94 (648)	1	50 (345)	34
EF 185	4	97.0	18.5	75 (517)	100 (689)	2	52 (358)	35

\* Non-Magnetic Compositions

Sources: ASTM B777-15, matweb.com

### FORMS AVAILABLE

- Flats •
- Parts | Part Blanks •
- Plate | Sheet •
- Round Bar •
- Shapes •



Please call us at 800-348-6268 for delivery lead times.

We can custom stock products in the size you require. No order is too small.

### SPECIFICATIONS

ASTM B777-15

EFI 2022-10-12-2022

# Special Purpose Alloys & Metals From Stock

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

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## 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/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

Ed Fagan Inc. 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 | 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/Rod, Square Bar, Strip/Coil, Wire Rod  
Trade Names: High Permeability 49®, Magnifer® 50

### EFI 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

## 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/Rod, 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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