

# Tungsten

## Refractory Metals and Alloys



# EFINEA

Capabilities Beyond Infinity

1-800-348-6268 | [efineametals.com](http://efineametals.com)

74

# W

183.84

Tungsten

**Tungsten** is a chemical element identified by the atomic number 74 and the symbol W. Tungsten is a refractory metal and most remarkable for its characteristic of having the highest melting point of all metals at 3420°C. In its pure form Tungsten's density is 19.25 g/cm<sup>3</sup> which is 1.7 times that of lead. Also, the element has the highest boiling point at 5555°C. Tungsten's excellent high-temperature stability and high modulus of elasticity provide it with a high creep resistance. Additional material characteristics are low coefficient of thermal expansion and low vapor pressure.

Tungsten has a body-centered cubic lattice. To improve the overall ductility of pure Tungsten, additives such as Rhenium, Nickel, Copper, or Iron are added to create Tungsten Heavy Alloys or Tungsten Alloys. These alloys enhance the mechanical properties and ability to machine the material.

### APPLICATIONS

High-temperature furnace components; glass-to-metal seals; electronics; medical devices; welding electrodes.

### Typical Physical Properties

|                                               |                        |       |
|-----------------------------------------------|------------------------|-------|
| Density                                       |                        | 19.25 |
| Melting Point                                 | °F                     | 61800 |
|                                               | °C                     | 3420  |
| Electrical Conductivity @20°C                 | S/m                    | 18.2  |
| Electrical Resistivity @20°C                  | (Ω-mm <sup>2</sup> )/m | 0.055 |
| Thermal Conductivity @20°C                    | W/(m·K)                | 164   |
| Specific Heat @20°C                           | J/(g·K)                | 0.13  |
| Coefficient of Linear Thermal Expansion @20°C | m/(m·K)                | 4.4   |

### Typical Mechanical Properties

|                                                                      |                 |          |
|----------------------------------------------------------------------|-----------------|----------|
| Yield Strength                                                       | MPa             | 750      |
| Typical Hardness @20°C<br>-Stress-Relief Annealed<br>-Recrystallized | HV 30 (Vickers) | >        |
|                                                                      | HV 30 (Vickers) | -360     |
|                                                                      |                 |          |
| Modulus of Elasticity                                                | ksi (GPa)       | 58 (405) |
| Poisson's Ratio                                                      |                 | 0.28     |

Source: Plansee, [www.plansee.com](http://www.plansee.com)

### Typical Application



### Forms Available

|                    |                 |
|--------------------|-----------------|
| Plate              | 0.1875"- 1.000" |
| Precision Cut Wire | 0.001"- 0.125"  |
| Round Bar   Rod    | 0.030"- 1.5748" |
| Sheet              | 0.002"- 0.750"  |

Listed above are our standard stock items. Our inventory fluctuates based on market demands. If you do not see the size you require listed above, please call us

### CHEMISTRY

99.95 Tungsten (W) Minimum | Source: ASTM 8760



### Specifications

AAMS 7898/7899; ASTM 8760, ASTM F2888 Type 1B; CAS 7440-33-7; UNS R07005

**EFINEA METALS | [www.efineametals.com](http://www.efineametals.com) | [sales@efineametals.com](mailto:sales@efineametals.com)**

# Special Purpose Alloys & Metal From Stock

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## EFINEA Services

Slitting, Sheering, Grinding, Water Jet Cutting, Laser Cutting, Saw 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

## Controlled Expansion | Glass Sealing

EFINEA 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® 42, 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; 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 & Alloys

EFINEA 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

### 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

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

### EFINEA Alloy 50

**Forms:** Round Bar/Rod, Square Bar, Strip/Coil, Wire Rod

Trade Names: High Permeability 49®, Mangnifer® 50

### EFINEA 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

### Core Iron (Pure Iron)

**Forms:** Round Bar/Rod, Plate

Trade Names: Electrical Iron®, Alliedpureiron®

## Electrical & Electronic Nickels

EFINEA supplies select, Commercially pure grades of Nickel in various forms and sizes.

### Electronic Nickels

200/201/205/233/270

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

## Copper Metals

EFINEA supplies select, Commercially pure grades of Copper in Coil Form

### Copper OFHC 101/102

### Nickel-Silver 770

### Cupro-Nickel 715 (CuNi 70/30)

**Forms:** Coil

## Stainless Steels & Other Alloys

EFINEA supplies select aircraft quality grades of Stainless Steel available in various forms and sizes.

### 17-4PH (Type 630)

### 15-5PH Vac Melt

### 300 Grade Stainless Steel Coils

**Forms:** Round Bar/Coils