

Nb

92.90637

Niobium

Niobium

Refractory Metals and Alloys

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DESCRIPTION

Niobium, also known as Columbium, is a shiny grey metal with a hardness similar to pure titanium and a ductility comparable to iron. Niobium is physiologically inert, hypoallergenic, and can be heated then anodized to produce iridescent colors making it a desirable property for prosthetics, implants and jewelry. Niobium becomes a superconductor at cryogenic temperatures and has the greatest magnetic penetration depth of any element. Niobium oxidizes at temperatures above 400°C. The element's reactivity with oxygen requires it to be worked in a vacuum or inert atmosphere.

The majority of mined Niobium is used as a micro-alloying element for steel. Also, Niobium quantities, as great as 6.5%, are added to nickel, cobalt, and iron to produce super alloys.

APPLICATIONS

Capacitors, arc-tube seals of sodium vapor lamps, high voltage wire for receptor modules, nuclear reactors, superconducting magnets.

TYPICAL PHYSICAL PROPERTIES

Density	lb/in ³	0.31
	g/cm ³	8.60
Melting Point	°F	4474
	°C	2468
Electrical Resistivity	Micro-ohm-cm	15.1
Thermal Conductivity	BTU-in/hr-ft ² - °F (@68 °F)	363
	W/m-K (@20°C)	52.3
Specific Heat Capacity	BTU/lb-°F	0.065
Coefficient of Linear Thermal Expansion	μin/in-°F (@68 - 212°F)	3.94
	μm/m-°C (@20 - 100°C)	7.10

Source: MatWeb. Material in the annealed condition

FORMS | SIZES AVAILABLE

Plate	0.187" - 1.000"
Round Bar Rod	0.030" - 4.000"
Sheet	0.010" - 0.125"
Strip Coil	0.010" - 0.070"
Wire	0.001" - 0.250"

If you do not see the size you require listed above, please call us.

TYPICAL MECHANICAL PROPERTIES

Ultimate Tensile Strength

Rod 0.125" to 2.5"	psi (MPa), Min	18000 (125)
Wire 0.020" to 0.124"		18000 (125)
Strip, Sheet, Plate*		18000 (125)

Yield Strength

Rod 0.125" to 2.5"	psi (MPa)	10500 (73)
Strip, Sheet, Plate*		10500 (73)

Elongation

Rod 0.125" to 2.5"	min % mm ^A	25
Wire 0.020" to 0.124"		20
Strip, Sheet, Plate* ≥ 0.010" (< 0.010")	min % in 1" length	20 (15)

Source ASTM B392-18 Table 3, *ASTM B393-18 Table 4, Types 1&2, Annealed Condition (90% Minimum Recrystallized). ^A10 in. (254 mm) gage length to 0.050 in. (1.27 mm) diameter, and 1 in. (25.4 mm) or 2.0 in. (50.8 mm) gage length equal to or over 0.050 in. (1.27 mm).

TYPICAL APPLICATION



Superconducting Magnets

CHEMISTRY %

99.6 Niobium (Nb) Minimum

SPECIFICATIONS

AMS 7850, ASTM B392-18 (Bar, Rod & Wire), B393-18 (Strip, Sheet & Plate) Types 1 & 2, UNS R04200, UNS R04210

Special Purpose Alloys & Metals From Stock

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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

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