

Refractory Metals

MOLYBDENUM

Density, G/CC	10.22	2510	← Melting Point
Atomic Number	42	1	
Symbol	Mo	13	← Electron Shells
Atomic Weight	95.94	18	
Valences	2,3	8	
	4,5,6	2	← Boiling Point
		5560	

Molybdenum 42	AMS 7817-19
Density	10.22 g/CC
Young's Modulus	329.0 GPa
Poisson's Ratio	0.380
Tensile Strength	515 MPa
Thermal Conductivity	138 W/mK
Expansion Coefficient	5.35 $\mu\text{m}/\text{m}^\circ\text{C}$

NIOBIUM

Density, G/CC	8.57	2468	← Melting Point
Atomic Number	41	1	
Symbol	Nb	12	← Electron Shells
Atomic Weight	92.9064	18	
Valences	2,3	8	
	4,5,6	2	← Boiling Point
		4927	

Niobium (Columbium) 41	ASM 7850-55, 7857
Density	8.57 g/CC
Young's Modulus	105.0 GPa
Poisson's Ratio	0.400
Tensile Strength	330 MPa
Thermal Conductivity	.523 cal/cm ² /cm ^{°C} /sec
Expansion Coefficient	7.3 $\mu\text{m}/\text{m}^\circ\text{C}$

RHENIUM

Density, G/CC	21.02	3180	← Melting Point
Atomic Number	75	2	
Symbol	Re	13	← Electron Shells
Atomic Weight	186.2	32	
Valences	1,2,3	18	
	4,5,6,7	8	← Boiling Point
		2	
		5900	

Rhenium 75	ASM 7850-55, 7857
Density	21.02 g/CC
Young's Modulus	465.0 GPa
Poisson's Ratio	0.296
Tensile Strength	1070 MPa
Thermal Conductivity	39.6 W/mK
Expansion Coefficient	6.12 $\mu\text{m}/\text{m}^\circ\text{C}$

TANTALUM

Density, G/CC	16.654	2996	← Melting Point
Atomic Number	73	2	
Symbol	Ta	11	← Electron Shells
Atomic Weight	180.948	32	
Valences	2,3	18	
	5,6	8	← Boiling Point
		2	
		6100	

Tantalum 73	MS 7846-49 ASTM-B-708
Density	16.6 g/CC
Young's Modulus	186 GPa
Poisson's Ratio	0.340
Tensile Strength	900 MPa
Thermal Conductivity	54.4 W/mK
Expansion Coefficient	6.50 $\mu\text{m}/\text{m}^\circ\text{C}$

TUNGSTEN

Density, G/CC	19.3	3410	← Melting Point
Atomic Number	74	2	
Symbol	W	12	← Electron Shells
Atomic Weight	183.85	32	
Valences	2,3	18	
	5,6	8	← Boiling Point
		2	
		5900	

Tungsten (Wolframium) 74	AMS 7878-7890, 7897-98
Density	19.3 g/CC
Young's Modulus	173.82 GPa
Poisson's Ratio	0.280
Tensile Strength	980 MPa
Thermal Conductivity	163.3 W/mK
Expansion Coefficient	4.40 $\mu\text{m}/\text{m}^\circ\text{C}$