

Tungsten Heavy Alloys (WHA)

Custom Solutions

Spectra-Mat Inc. (SMI), manufactures tungsten alloys ranging from 90 to 95 percent tungsten content. Addition of nickel and copper promote tungsten solubility and wetting during the manufacturing process. The result is a fully dense material with unique thermal and mechanical properties.

Applications for WHA frequently require one or more stringent physical properties. Tungsten heavy alloys display superior structural properties compared to pure tungsten, as well as low thermal expansion and densities approaching that of pure tungsten. The high density insures WHA's superior performance in radiation shielding, x-ray and g-ray collimation, as well as its use as an environmentally friendly lead replacement. Other uses include gyroscopic components, boring bars, and armor piercing projectiles.

Sintering W/Ni/Cu powders creates a ductile, machinable non-magnetic alloy capable of holding precision component tolerances. SMI provides these machined components exactly manufactured to our customers' specifications. The alloys can be plated with nickel and gold for corrosion control and solderability.

¹ WHA SMI's compares favorably to the copper-based tungsten alloys of AMS-T-21014; the specification contains additional material properties not found here.

Typical Properties		
Material Composition (weight %)	W/Ni/Cu 90/6/4	W/Ni/Cu 95/3.5/1.5
Thermal Expansion (x10 ⁻⁶ /K) 50-400°C	6.2	5.2
Thermal Conductivity (W/m•K) 25°C	70	75
Density (g/cc)	17.0	18.2
Hardness (Rockwell C)	24	27
Yield Strength 0.2% offset (PSI)	80,000	85,000
Modulus (PSI)	40 x 10 ⁶	45 x 10 ⁶



For additional information, applications or pricing, please contact: