

## About Tungsten & Molybdenum

Tungsten and Molybdenum have been put into practical use as electric tube material. In recent years, they have been widely used in the fields not only of electric tubes but also semiconductor production, office automation equipment, nuclear plant equipment, medical appliances and so on as they have excellent high temperature characteristics.

Tungsten has the highest melting point, namely 3400 deg. C, of all metals. It has also other merits such as low vapor pressure at high temperature, high mechanical strength and very small gas emission.

As regards molybdenum, it is very promising material as it has lower vapor pressure and lower gas emission than other metals, although its high temperature properties are slightly lower than those of tungsten. We make these superior methods into thin wires, the TW series for tungsten wires and the TM series for Molybdenum wires. Please try them and use how good they are!

### PHYSICAL PROPERTIES

TUNGSTEN	ITEM	MOLYBDENUM
74	Atomic Number	42
183.92	Atomic Weight	95.95
Body centered cubic lattice	Crystal System	Body centered cubic lattice
3410±10°C	Melting Point	2620± 10°C
Approximately 5900°C	Boiling Point	Approximately 4800°C
255 kJ/kg	Heat of Fusion	209 kJ/kg
19.2 Mg/m <sup>3</sup>	Density	10.2 Mg/m <sup>3</sup>
0.14 kJ/(kg-K)	Specific Heat	0.24 kJ/(kg-K)
2200°C 5.33x10 <sup>-6</sup> Pa	Vapor Pressure	1500°C 8.53x10 <sup>-7</sup> Pa
2500°C 6.67x10 <sup>-4</sup> Pa		1800°C 547x10 <sup>-5</sup> Pa
3000°C 1.33X10 <sup>-1</sup> Pa		2000°C 5.47X10 <sup>-3</sup> Pa
		2500°C 1.33 Pa
5.1x10 <sup>-3</sup> °C (0~170°C)	Temperature Coefficient for Electric Resistivity	5.0x10 <sup>-3</sup> °C (0~170°C)
0.729 aJ(4.55eV)	Work Function	0.673 aJ (4.20eV)
407 kN/mm <sup>2</sup>	Young's Modulus	330 kN/mm <sup>2</sup>
166 kN/mm <sup>2</sup>	Modulus of Rigidity	138 kN/mm <sup>2</sup>
0.17	Poisson Ratio	0.324 (27°C)