

# Tungsten Square Single Crystal

**Formula:** W

**Percentage Purity:** 99.99%

**Thickness:** 1mm

**Size:** 4x4mm

**Orientation:** -100

**Orientation Accuracy:** = 1°

**Polish:** Polished

**Surface Finish:** = 0.03µm Ra

**CAS Number:** 7440-33-7

**UOM Code:** 134-045-12

**SKU:** 1000039569-group

**Product Code:** W-00-SC-000224

## Material Properties for Metals

### Atomic Properties

Element	Value
Atomic number	74
Crystal structure	Body centred cubic
Electronic structure	Xe 4f <sup>14</sup> 5d <sup>4</sup> 6s <sup>2</sup>
Valences shown	2,3,4,5,6
Atomic weight( amu )	183.85
Thermal neutron absorption cross-section( Barns )	18.5
Photo-electric work function( eV )	4.55
Natural isotope distribution( Mass No./% )	183/ 14.3
Natural isotope distribution( Mass No./% )	182/ 26.3
Natural isotope distribution( Mass No./% )	186/ 28.6
Natural isotope distribution( Mass No./% )	180/ 0.1
Natural isotope distribution( Mass No./% )	184/ 30.7
Atomic radius - Goldschmidt( nm )	0.141
Ionisation potential( No./eV )	1/ 7.98
Ionisation potential( No./eV )	2/ 17.7

### Mechanical Properties

<b>Element</b>	<b>Value</b>
Material condition	Soft
Material condition	Hard
Poisson's ratio	0.28
Poisson's ratio	0.28
Bulk modulus( GPa )	311
Bulk modulus( GPa )	311
Tensile modulus( GPa )	411
Tensile modulus( GPa )	411
Hardness - Vickers( kgf mm <sup>2</sup> )	360
Hardness - Vickers( kgf mm <sup>2</sup> )	500
Tensile strength( MPa )	550-620
Tensile strength( MPa )	1920
Yield strength( MPa )	550

## **Electrical Properties**

<b>Element</b>	<b>Value</b>
Electrical resistivity( $\mu\text{Ohmcm}$ )	5.4@20@20°C
Superconductivity critical temperature( K )	0.0154
Temperature coefficient( K <sup>-1</sup> )	0.0048@0-100°C
Thermal emf against Pt (cold 0C - hot 100C)( mV )	1.12

## **Physical Properties**

<b>Element</b>	<b>Value</b>
Boiling point( C )	5660
Density( gcm <sup>3</sup> )	19.3@20°C

## **Thermal Properties**

<b>Element</b>	<b>Value</b>
Melting point( C )	3410
Latent heat of evaporation( J g <sup>-1</sup> )	4009
Latent heat of fusion( J g <sup>-1</sup> )	192
Specific heat( J K <sup>-1</sup> kg <sup>-1</sup> )	133@25°C
Thermal conductivity( W m <sup>-1</sup> K <sup>-1</sup> )	173@0-100°C
Coefficient of thermal expansion( $\times 10^{-6}$ K <sup>-1</sup> )	4.5@0-100°C