

# Tantalum Square Single Crystal

**Formula:** Ta

**Percentage Purity:** 99.999%

**Thickness:** 1mm

**Size:** 4x4mm

**Orientation:** -100

**Orientation Accuracy:** Approx. 0.1°

**Polish:** Polished

**Surface Finish:** = 0.03µm Ra

**CAS Number:** 7440-25-7

**UOM Code:** 137-516-31

**SKU:** 1000041396-group

**Product Code:** TA00-SC-000165

## Material Properties for Metals

### Atomic Properties

Element	Value
Atomic number	73
Crystal structure	Body centred cubic
Electronic structure	Xe 4f <sup>14</sup> 5d <sup>3</sup> 6s <sup>2</sup>
Valences shown	2,3,4,5
Atomic weight( amu )	180.9479
Thermal neutron absorption cross-section( Barns )	22
Photo-electric work function( eV )	4.1
Natural isotope distribution( Mass No./% )	180/ 0.012
Natural isotope distribution( Mass No./% )	181/ 99.988
Atomic radius - Goldschmidt( nm )	0.147
Ionisation potential( No./eV )	1/ 7.88
Ionisation potential( No./eV )	2/ 16.2

### Mechanical Properties

Element	Value
Material condition	Hard
Material condition	Soft

<b>Element</b>	<b>Value</b>
Poisson's ratio	0.342
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Bulk modulus( GPa )	196.3
Bulk modulus( GPa )	196.3
Tensile modulus( GPa )	185.7
Tensile modulus( GPa )	185.7
Hardness - Vickers( kgf mm <sup>2</sup> )	200
Hardness - Vickers( kgf mm <sup>2</sup> )	90
Tensile strength( MPa )	760
Tensile strength( MPa )	172-207
Yield strength( MPa )	705
Yield strength( MPa )	310-380

## **Electrical Properties**

<b>Element</b>	<b>Value</b>
Electrical resistivity( $\mu\text{Ohmcm}$ )	13.5@20@20°C
Superconductivity critical temperature( K )	4.47
Temperature coefficient( K <sup>-1</sup> )	0.0035@0-100°C
Thermal emf against Pt (cold 0C - hot 100C)( mV )	0.33

## **Physical Properties**

<b>Element</b>	<b>Value</b>
Boiling point( C )	5425
Density( gcm <sup>3</sup> )	16.6@20°C

## **Thermal Properties**

<b>Element</b>	<b>Value</b>
Melting point( C )	2996
Latent heat of evaporation( J g <sup>-1</sup> )	4165
Latent heat of fusion( J g <sup>-1</sup> )	174
Specific heat( J K <sup>-1</sup> kg <sup>-1</sup> )	140@25°C
Thermal conductivity( W m <sup>-1</sup> K <sup>-1</sup> )	57.5@0-100
Coefficient of thermal expansion( $\times 10^{-6}$ K <sup>-1</sup> )	6.5@0-100°C