

# Gold Thin Film

**Formula:** Au

**Percentage Purity:** 99.99%

**Thickness:** 0.05 $\mu$ m

**Length 1:** 10mm

**Length 2:** 10mm

**Area Density:** 96.5 $\mu$ g/cm<sup>2</sup>

**Support:** Permanent Quartz 0.5mm

**CAS Number:** 7440-57-5

**UOM Code:** 257-359-78

**SKU:** 1000032376-group

**Product Code:** AU00-MF-000602

## Material Properties for Precious Metals

### Atomic Properties

Element	Value
Atomic number	79
Crystal structure	Face centred cubic
Electronic structure	Xe 4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>1</sup>
Valences shown	1,3
Atomic weight( amu )	196.9665
Thermal neutron absorption cross-section( Barns )	98.8
Photo-electric work function( eV )	4.8
Atomic radius - Goldschmidt( nm )	0.144
Ionisation potential( No./eV )	1/ 9.22
Ionisation potential( No./eV )	2/ 20.5

### Mechanical Properties

Element	Value
Material condition	Soft
Material condition	Hard
Poisson's ratio	0.42
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Bulk modulus( GPa )	171

<b>Element</b>	<b>Value</b>
Bulk modulus( GPa )	171
Tensile modulus( GPa )	78.5
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Hardness - Vickers( kgf mm <sup>2</sup> )	20-30
Hardness - Vickers( kgf mm <sup>2</sup> )	60
Tensile strength( MPa )	130
Tensile strength( MPa )	220
Yield strength( MPa )	205
Yield strength( MPa )	-

## **Electrical Properties**

<b>Element</b>	<b>Value</b>
Electrical resistivity( $\mu\text{Ohmcm}$ )	2.20@20@20°C
Temperature coefficient( K <sup>-1</sup> )	0.004@0-100°C
Thermal emf against Pt (cold 0C - hot 100C)( mV )	0.74

## **Physical Properties**

<b>Element</b>	<b>Value</b>
Boiling point( C )	3080
Density( gcm <sup>3</sup> )	19.3@20°C

## **Thermal Properties**

<b>Element</b>	<b>Value</b>
Melting point( C )	1064.4
Latent heat of evaporation( J g <sup>-1</sup> )	1738
Latent heat of fusion( J g <sup>-1</sup> )	64.9
Specific heat( J K <sup>-1</sup> kg <sup>-1</sup> )	129@25°C
Thermal conductivity( W m <sup>-1</sup> K <sup>-1</sup> )	318@0-100°C
Coefficient of thermal expansion( $\times 10^{-6}$ K <sup>-1</sup> )	14.1@0-100°C