

# INDIUM



**AIM is a leading supplier of high purity indium solders, compounds and chemicals used in a broad range of applications. AIM's indium products include:**

- **SOLDERS**
  - Paste, Wire, Preforms, Foil, Ribbon, Spheres
- **TARGETS**
  - Sputtering Target Form or Evaporation Source.
- **CHEMICALS & COMPOUNDS**
  - Acetate, Oxide, Hydroxide, Sulfate, Sulphamate, Trichloride

The unique properties of indium are driving its use into a broad variety of applications in new markets.

Indium is a highly malleable, low melting element that remains workable to cryogenic temperatures. Indium alloys offer a broad range of mechanical and melting characteristics. Indium alloys with excellent fatigue resistance are a good choice for use in difficult joining applications, while the wide range of melting temperatures of various indium alloys meet many fusible alloy needs.

Indium is a chemically versatile element. High purity indium is often utilized in the manufacture of III-V semiconductors, and indium-tin-oxide (ITO) is an important transparent conducting oxide in LCD and related technologies. Inorganic salts are utilized in alkaline battery manufacturing and a number of indium plating chemicals are used in depositing indium as a lubricant to bearing surfaces.

**Whatever your application, AIM has the indium based products and technical support to fulfill your most stringent requirements.**

For additional information please contact AIM at  
1 800 CALL-AIM (225-5246)  
1 401 463-5605  
1 401 463-0203 Fax  
or visit us on the web at  
[www.aimsolder.com](http://www.aimsolder.com)

## Published Technical Data on Pure Indium

### General Data

Atomic Number	49
Atomic Weight	114.82
Stable Isotopes	113;115
Valence	3 (2 and 1)
Crystal Structure	a = 0.3253 nm c = 0.4947 nm
Density	
Solid (20°C)	7.31 Mg.m <sup>-3</sup>
Liquid (157°C)	7.023 Mg.m <sup>-3</sup>
Volume Change on Solidification	2%, 2.5%

### Electrical Properties

Electrical Resistivity	
Below 3.41k pure indium is superconducting	
Solid (20°C)	8.8 micro Ohms.cm
Liquid (157°C)	29 micro Ohms.cm
Temperature Coefficient of Resistivity (0 - 100°C)	5.2 x 10 <sup>-3</sup> K <sup>-1</sup>
Electrode Potential	0.338V
Electromechanical Equiv.	0.396 41g.Coulomb <sup>-1</sup>

### Mechanical Properties

Tensile Data	
UTS (294K, 77K)	2.7, 14.5 MPa
YS (294K, 77K) 1.	4, 5.0 MPa
Elastic Modulus	10.8 - 12.8 GPa
Hardness	0.9HB
Poisson's Ratio (20°C)	0.445

### Thermal Properties

Melting Point	156.598°C
Boiling Point	2070-2080°C
Latent Heat	
Fusion	24.28 kJ.kg <sup>-1</sup>
Evaporation	1959-2024 kJ.kg <sup>-1</sup>
Mean Specific Heat	
Solid (0-100°C)	243 J.kg <sup>-1</sup> K <sup>-1</sup>
Liquid (200-400°C)	259 J.kg <sup>-1</sup> K <sup>-1</sup>
Mean Thermal Conductivity	
Solid (0-100°C)	70 - 80 W.m <sup>-1</sup> K <sup>-1</sup>
Liquid (160-400°C)	42 W.m <sup>-1</sup> K <sup>-1</sup>
Linear CTE	24.8 x 10 <sup>-6</sup> K <sup>-1</sup>

### Liquid Indium Properties (between melting and boiling points)

Density (Mg.m <sup>-3</sup> )	~ 7.1295 - 0.6798 x 10 <sup>-3</sup> T
Surface Tension (mN. m <sup>-1</sup> )	~ 571 - 0.09T (T, °C)
Viscosity (mN.s.m <sup>-2</sup> )	~ 0.302exp(800/T) (T,K)
Vapor Pressure (p, kPa)log <sub>10</sub> p	~ 1.42 - (1825/T) - 0.0653log <sub>10</sub> T (T,K)