

Product Data Sheet

# Indium Oxide Type T (Target-Grade) (Indium Sesquioxide) $In_2O_3$

## Introduction

**Indium oxide ( $In_2O_3$ )** is a yellow-colored powder with a molecular weight of 277.64. It is a stable ceramic-like material which is insoluble in water and volatilizes at 850 °C. Indium oxide is an n-type semiconductor.

**The particle morphology of Type T (target-grade) indium oxide is optimized for powder compaction to produce high density ITO and IGZO sputter targets.** High density targets result in superior sputter deposited layers on glass and plastic substrates.

To manufacture ITO sputter targets, indium oxide is doped with tin oxide ( $SnO_2$ ) at 10 weight percent (tin oxide doping can range from 5–10 weight percent). To manufacture IGZO sputter targets, indium oxide is combined with gallium oxide ( $Ga_2O_3$ ) and zinc oxide ( $ZnO$ ).

ITO-sputtered films function as transparent conductive oxide (TCO) layers, conducting electricity while also transmitting visible light. Although there are several doped metal oxides that function as TCOs, ITO represents the premium TCO material since it has the best combination of electrical conductivity and optical transparency at a given thickness. ITO functions as the display electrode material in both LCDs and OLED displays, and as the touch sensor in tablets, smartphones, and touch-enabled computers.

IGZO films are increasingly used in the display backplane to form the channel layer of the thin film transistors. IGZO offers higher carrier mobility (compared to a-Si) and lower process complexity (compared to LTPS), both of which are crucial for increasing the pixel density on displays.

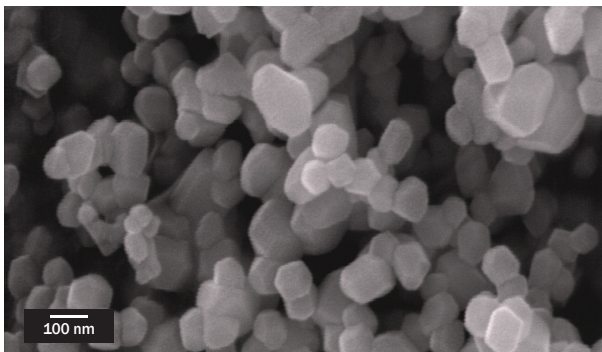


## Properties

<b>Chemical Formula</b>	$In_2O_3$
<b>Molecular Weight</b>	277.64
<b>General Description</b>	Yellow-colored powder
<b>Uses</b>	Manufacture of ITO and IGZO sputter targets
<b>Solubility</b>	Insoluble in water and alcohols
<b>Nominal Indium Percentage</b>	82.7%
The data below shows <b>typical</b> properties. Please call to discuss if you require a specific range or specific upper limits for impurities.	
<b>Impurities</b>	4N5 Fe < 5 ppm (typical) Si < 10 ppm (typical)
<b>Specific Surface Area</b>	7–13 m <sup>2</sup> /g
<b>Particle Size Distribution</b>	D50: 0.3–1 µm D90: < 5 µm
<b>Morphology</b>	Primary particle size ~ 100 nm

## Optional

Particle size distribution and BET can be tailored to optimize performance for a specific application. Please contact our technical support team to discuss your requirements.



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Form No. 98737 R3

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## Indium Oxide Type T (Target-Grade) (Indium Sesquioxide) $\text{In}_2\text{O}_3$

### Storage and Shelf Life

**Indium Oxide Type T** should be stored at room temperature and the container kept tightly sealed. **Indium Oxide Type T** has a shelf life of 12 months.

### Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>

### Technical Support

Indium Corporation's internationally experienced engineering team provides in-depth technical assistance to our customers.

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

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