

# PRODUCT DATA SHEET

# IndiOx<sup>®</sup> (Indium Oxide) Type T (Target-Grade) (Indium Sesquioxide) In<sub>2</sub>O<sub>3</sub>

## Introduction

**IndiOx<sup>®</sup> Type T (In<sub>2</sub>O<sub>3</sub>)** 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. **IndiOx<sup>®</sup> Type T** 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<sub>2</sub>) 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<sub>2</sub>O<sub>3</sub>) 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.

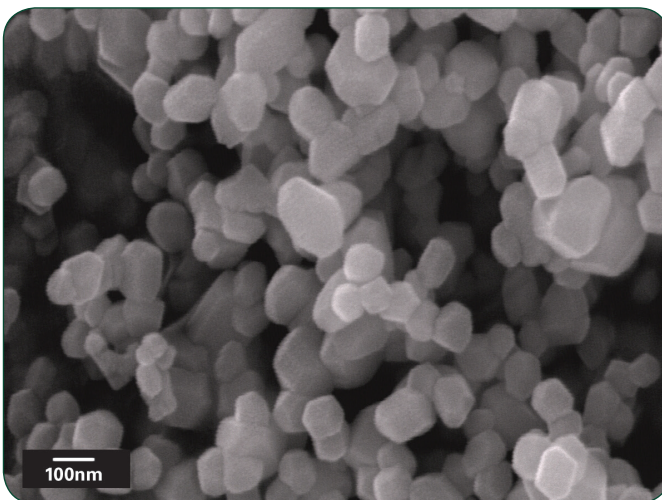


## Properties

|   |  |
|---|--|
| Chemical Formula  | In <sub>2</sub> O <sub>3</sub>                     |
| Molecular Weight  | 277.64   |
| General Description   | Yellow-colored powder                              |
| Uses  | Manufacture of ITO and IGZO sputter targets        |
| Solubility  | Insoluble in water and alcohols                    |
| Nominal Indium Percentage   | 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. |  |
| Impurities  | 4N5<br>Fe < 5ppm (typical)<br>Si < 10ppm (typical) |
| Specific Surface Area   | 7–13m <sup>2</sup> /g                              |
| Particle Size Distribution  | D50: 0.3–1µm<br>D90: < 5µm                         |
| Morphology  | Primary particle size ~100nm                       |

## 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.



From One Engineer To Another<sup>®</sup>



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(Indium Sesquioxide)  $\text{In}_2\text{O}_3$

### Product Packaging

- Our powder is securely packaged to avoid contamination during shipment, and we use a variety of container sizes to ship.
- Containers can hold from 0.1–50kg of product per container.
- Containers available include wide-mouth plastic jars and pails, as well as plastic and steel drums.
- Custom packaging is available on request.

### Storage and Shelf Life

IndiOx<sup>®</sup> Type T should be stored at room temperature and the container kept tightly sealed. IndiOx<sup>®</sup> 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.

*All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified. Indium Corporation is an ISO 9001:2015 registered company.*

Contact our engineers: [askus@indium.com](mailto:askus@indium.com)

Learn more: [www.indium.com](http://www.indium.com)

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