PRODUCT DATA SHEET

Indium-Tin Oxide (ITO)

In_2O_3: SnO_2

Introduction

Indium-tin oxide (ITO, or tin-doped indium oxide) is a mixture of indium(III) oxide (In_2O_3) and tin(IV) oxide (SnO_2), typically 90% In_2O_3, 10% SnO_2 by weight.

In powder form it is yellow-green in color, but it is transparent and colorless when deposited as a thin film at thicknesses of 50–300nm. When deposited as a thin film on glass or clear plastic, it functions as a transparent electrical conductor.

ITO is normally deposited by a physical vapor deposition process such as D.C. magnetron sputtering or electron beam deposition. Less frequently, **ITO** can be incorporated in inks using an appropriate film-forming polymer resin and solvent system, and deposited by screen printing albeit with lower transparency and conductivity compared to a physical deposition process. Of the various transparent conductive oxides (TCOs), **ITO** is considered the premium TCO, having superior conductivity and transparency, stability, and ease of patterning to form transparent circuitry.

ITO is used in both LCDs and OLED displays, as well as in plasma, electroluminescent, and electrochromatic displays. It is also utilized in touch panels, antistatic coatings, EMI shielding, aircraft windshields, freezer-case glass for demisting, and photovoltaic solar cells. A further use is as an IR-coating to reflect heat energy, such as in low-E glass and in low-pressure sodium lamps.

Indium Corporation uses a proprietary process to manufacture co-precipitated **ITO** powder of high purity. This process achieves tin-doping at customer-specified levels through actual substitution of tin in the indium oxide crystal lattice.

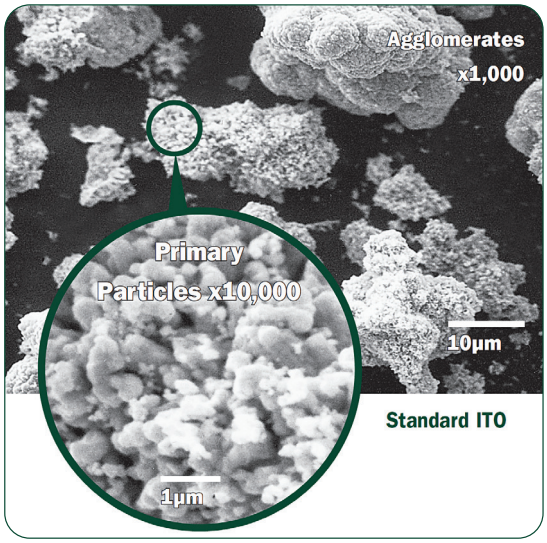
Our experience in process engineering enables us to manufacture **ITO** powder with a close tolerance particle size distribution, tap density, and BET properties. This enables our customers to manufacture high-quality, high-density **ITO** sputtering targets and electron beam deposition sources.

Powder Description

The powder morphology or grain structure of **ITO** varies slightly with the level of tin-doping. The morphology represented in this product data sheet is typical for a 10.0 weight percent SnO_2 equivalent doping level.

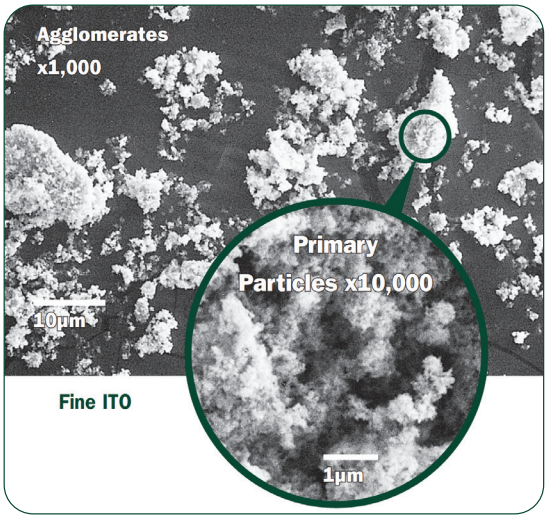
Standard ITO

- Primary particles are regularly shaped ranging in size from 0.4 to 1.0µm
- Agglomerates in size up to approximately 31µm



Fine ITO

- Primary particles are regularly shaped ranging in size from 0.1 to 1.0µm
- Agglomerates in size up to approximately 7µm



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INDIUM CORPORATION®

Form No. 97550 (A4) R12

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Physical Property Analysis

Powder Attributes of Indium-Tin Oxide				
Product Type	Approximate PSD Microns*			
	d90	d50	d10	BETm^2/g (typical)
Type A– *standard*–99.99% ITO	32.0–44.0	13.2–24.0	2.7–8.0	2.4
Type D– *very fine*–99.99% ITO	4.3–11.5	1.1–3.0	0.4–0.8	18.5

*Light Scattering Analysis

Product Characteristics

Color	Greenish yellow
Specific Gravity	7.2g/cc (Apparent density 0.5–1.2g/cc)

Standard Packaging

Quantity	Container**
Up to 1kg	1.4 liter (3 pints) plastic wide mouth jar
1–10kg	3.8 liter (1 gallon) plastic wide mouth jar
10–20kg	18.9 liter (5 gallons) plastic pail
20–30kg	18.9–30.3 liter (5–8 gallons) plastic drum
>30kg	60.6 liter (16 gallons) plastic or steel drum

**Packaging in other sizes or glass may be available upon request.

All information is for reference only.
Not to be used as incoming product specifications.

Storage and Shelf Life

Indium-tin oxide should be stored at room temperature and the container kept tightly sealed. **Indium-tin oxide** has a shelf life of 12 months.

Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

Indium Corporation is the leading global supplier of bulk indium, high-purity indium, indium fabrications, alloys, and compounds. **Indium-tin oxide** is produced in high volume utilizing state-of-the-art SPC-controlled chemical processing equipment. This, coupled with rigorous quality standards and advanced analytical instrumentation such as ICPMS, ensures consistent product quality.

Contact our engineers: askus@indium.com
Learn more: www.indium.com

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