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 1000-3000 angstroms. 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 LCD, plasma, EL, electrochromatic and OLED displays, touch panels, antistatic coatings, EMI shielding, aircraft windshields and freezer case glass for demisting and photovoltaic solar cells. A lesser use is as an infrared reflecting 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.

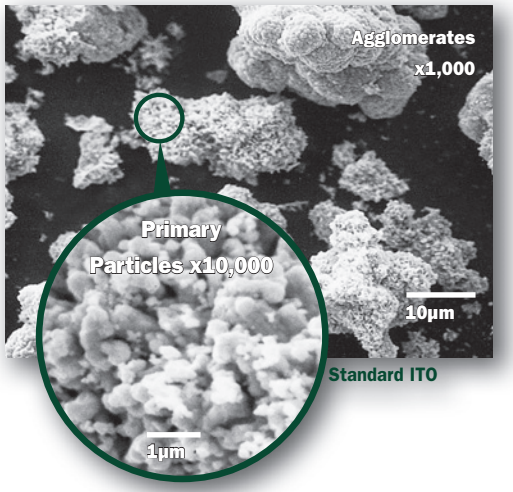
Our experience in process engineering enables us to manufacture **ITO** powder with a close tolerance particle size distribution, tap density, and BET properties. This enables our customers to manufacture high quality, high density **ITO** sputtering targets and electron bean deposition sources.

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

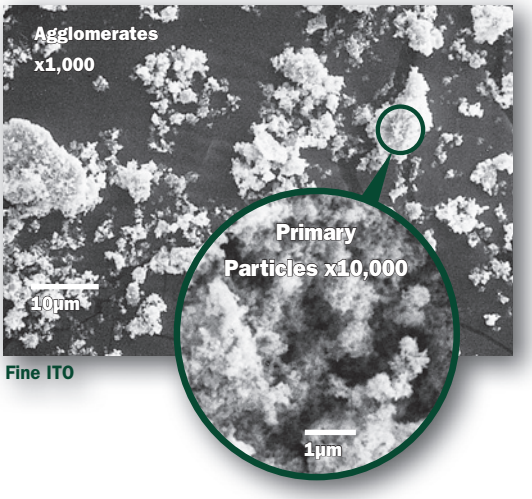
- Primary particles are regularly shaped ranging in size from 0.4 to 1.0 µm
- Agglomerates in size up to approximately 31 µm



Standard ITO

Fine ITO

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



Fine ITO

OVER→

Form No. 97550 R7

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ISO 9001 REGISTERED

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Physical Property Analysis

Powder Attributes of Indium-Tin Oxide					
Product Type	Approximate PSD Microns*				
	d90	d50	d10	Tap Density g/cc	BET m^2/g
Type - A - *standard* - 99.99% ITO	37.5	19.5	5.8	1.6	2.4
Type B - *fine* - 99.99% ITO	12.5	2.1	0.5	0.8	24.9
Type D - *very fine* - 99.99% ITO	8.9	1.6	0.5		18.5

* Light Scattering Analysis

Product Characteristics

Color	Greenish Yellow
Specific Gravity	7.2 g/cc (Apparent Density 0.5-1.2 g/cc)

Standard Packaging

Quantity	Container**
Up to 1 kg	1.4 liter (3 pint) plastic wide mouth jar
1-10 kg	3.8 liter (1 gallon) plastic wide mouth jar
10-20 kg	18.9 liter (5 gallon) plastic pail
20-30 kg	18.9-30.3 liter (5-8 gallon) plastic drum
>30 kg	60.6 liter (16 gallon) 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.

Material Safety Data Sheets

The MSDS for this product can be found online at http://www.indium.com/techlibrary/msds.php

Indium Corporation is the leading global supplier of bulk indium, high purity indium, indium fabrications, alloys and chemicals. 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, insures consistent product quality.

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