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Indium Tin Oxide Market Assessment, By Grade Type [Military Grade, Technical Grade, Food Grade, Optical Grade], By Application [Transparent Coatings, Electroluminescent Displays, Semiconductors, Laser Materials, Others], By End-user [Electrical and Electronics, Defense and Military, Chemical, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Indium tin oxide market size was valued at USD 215.89 million in 2022, which is expected to reach USD 309.38 million in 2030, with a CAGR of 4.6% for the forecast period between 2023 and 2030.

The introduction of indium tin oxide (ITO), which comprises a solid solution of indium (III) oxide and tin (IV) oxide with numerous unique properties, has transformed sectors like electronics, military, etc. Due to optical transparency and electrical conductivity, ITO is extensively used to provide conductive transparent coatings.

ITO coatings are widely used for LCD/plasma displays, touch screens, energy-conserving windows, photovoltaics, and electrochromic and electroluminescent displays. The deposition of indium tin oxide as a thin film on glass or clear plastic assists as the function of transparent electrical conductor. Electromagnetic shielding, photovoltaic solar cells, freezer case glass are some prominent applications of indium tin oxide.

Indium tin oxide (ITO) is extensively used in prominent sectors like defence and military, electronics, industrial coatings, etc. In August 2021, Envision AESC has invested around USD 393 million with the objective to establish one of the Japan’s largest

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manufacturing units that will subsequently produces next-generation lithium-ion batteries for electric vehicles.

The rising conductive and conductive coating solution significantly propels the indium tin oxide (ITO) market. France a developed country with around 67 million population has progressively accomplished new industry establishment. In June 2023, France has successively invested in STMicroelectronics with a huge sum of USD 3.10 billion with the objective to build a semiconductor factory in Crolles, southeastern France.

Incorporation of Indium Tin Oxide to Develop Coating Solutions

Indium tin oxide is considered an essential conductive and transparent coating that is extensively used in numerous applications for research and development, commercial products, modern digitalization, etc. ITO coatings are widely used to manufacture IR-mirrors and FIR-filters that subsequently develop low surface resistance and high film thickness to generate an optimum reflection in the higher infrared wavelength ranges. Indium tin oxide possesses excellent optical, optoelectronic properties that imperatively optimize the necessary heat to extend the operating temperature of LCDs (liquid crystal displays) within the prevailing cold conditions. ITO deposition assists in providing transparent conductive films on organic EL and touch panels, LCD panels, etc.

Advancement in Military Vehicles is Augmenting the Indium Tin Oxide Market

Electromagnetic (EM) shielding absorbers are recognized as a prominent component in reducing undesirable EM radiation from high-integrated electric equipment in vehicles used for military purposes. Indium tin oxide (ITO) is a versatile material where the deposition film leads to electromagnetic shielding for aircraft windshields and as a transparent absorber that is suitable for glass windows of military vehicles. Indium tin oxide (ITO) nanoparticles with effective microwave absorption and low infrared emissivity are successfully used for advanced modern military detection technology.

The defense ministry of Indian government has commissioned to increase defense production from USD 12 billion to USD 22 billion by 2025. In 2020, the annual revenue of USD 20 million Saudi Arabian Military Industries (SAMI) exponentially increased to USD 690 million in 2021. In its National Defence budget 2022, the Canadian government allocated over USD 8 billion for the next five years to augment the capacity and potential of Canadian Armed Forces. The growth and significant investment across various defense departments has substantially generated huge market potential for indium tin oxide (ITO).

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Increasing Demand for Advanced Electronic Devices is Augmenting the Market

Among various transparent conductive oxides, indium tin oxide is considered a premium and suitable material as it possesses superior conductivity and transparency. The deposition of ITO is generally carried out by a physical vapor deposition process such as D.C. magnetron sputtering or electron beam deposition. ITO is extensively used in touch screen technologies like tablets, smartphones, and notebooks and in numerous display technologies like electroluminescent displays, LCD, OLED, plasma, etc. 3M has successfully developed advanced indium tin oxide (ITO) film that exhibits low electrical resistivity, which is less than 150 ohms per square, and significantly enables multi-touch applications uniformly.

The data published by the JEITA stated that, in 2022, the total global production of electronics and IT industry is estimated to rise by around 1% to reach USD 3,436.8 billion. In February 2022, the government distributed a huge amount of USD 240 million that will significantly provide opportunities for Canada to become a global leader in photonics and substantially accelerate the development and manufacturing of semiconductors. The phenomenal rise in the electronics industry is significantly generating global opportunities for indium tin oxide to implement transparent absorbers, which has dominated the market.

Impact of COVID-19

The outbreak of COVID-19 has severely impacted human livelihood where every person was vulnerable to infectious disease and several sectors were in position of shutdown. The revenue for electronic sectors has drastically reduced during the pandemic due to lower consumer demands. The shutdown of industrial operations due to imposed lockdowns and less workforce impacted several manufacturing units including indium tin oxide. The lowering in demand for electronic gadgets and touch panels has substantially de-structured the incorporation of indium tin oxide and significantly discouraged the growth potential. The closure of electronic and electrical outlets due to imposed lockdown has degraded the market of indium tin oxide. Semiconductors demand for wireless and communication devices drastically dropped as the consumer preferences shifted to less expensive phones. However, during the second half of 2020 after pandemic, the semiconductor industry has shown a decent growth which accounts for urgent consumer demand which encourages industries to bid for indium tin oxide (ITO) product in their portfolio.

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Key Players Landscape and Outlook

The global indium tin oxide market is successfully growing with the increasing demand for advanced touch panels and electroluminescent displays. Diamond Coatings Inc. has developed indium tin oxide coating solutions that are widely used to manufacture IR-mirrors and FIR-filters. Their anti-reflection- ‘V’ coat used for a wide range of wavelengths in the visible, infra-red, and UV regions. It offers ITO coated glass sheets with smooth surfaces for OLED type applications. DIAMOX + ITO coatings are multilayer coatings of metal oxides and quartz and can be deposited onto acrylic, polycarbonate, and glass substrates.

Enam Optoelectronic Material Co., Ltd. has developed excellent quality, fine indium tin oxide (ITO) powder which is supplied either in the powder form or in processed form and possesses incredible characteristics that extends its usage to LEDs, LCDs, and similar electronic appliances. The company’s product portfolio comprises a wide range of indium tin oxide (ITO) which can be specifically designed and used.

Diamond Coatings Inc. has collaborated with the European Space Agency where the partnership assists in exploring and observing the sun with Solar Orbital using indium tin oxide coatings and anti-reflection coatings. In September 2021, the company releases anti-reflective display solutions that are available in various sheet sizes of 250mm*250mm or 1000mm*1000mm.

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