

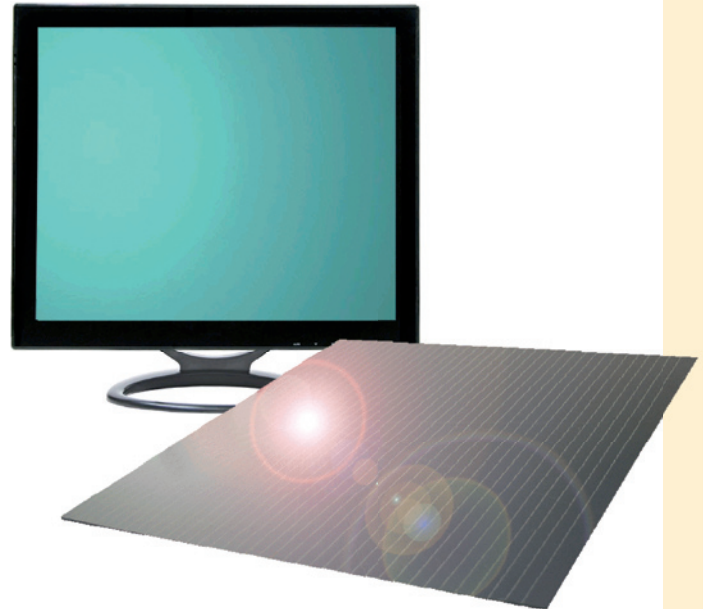
TCO & ITO Coated Glass and Web Materials Quality Control Solutions for Higher Yields



ITO COATED MATERIALS - APPLICATIONS AND CHARACTERISTICS

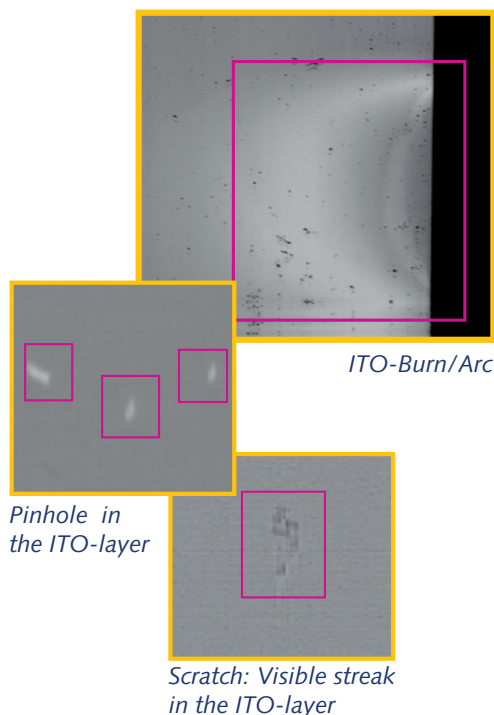
Transparent conducting oxides (TCO) serve as a coating layer for a wide variety of applications. Zinc-Oxide (ZnO) and Indium-Tin-Oxide (ITO) as subtypes of TCO are becoming more and more important for a growing number of high tech applications.

- Solar modules, thin film photovoltaic cells
- Liquid crystal displays (LCD), touch-screens and flat screen displays e.g. as used in phones, PDA's, digital cameras
- Aircraft windshields, de-icing and heater applications
- Transparent antistatic panels
- OLED applications
- Devices that require deposition of ultra thin layers onto conductive substrates



Various applications are using TCO/ITO coating material due to their high electrical conductivity and full transparency, e.g. LCD panels or thin film solar modules

Typical defects of TCO/ITO coated glass and web material



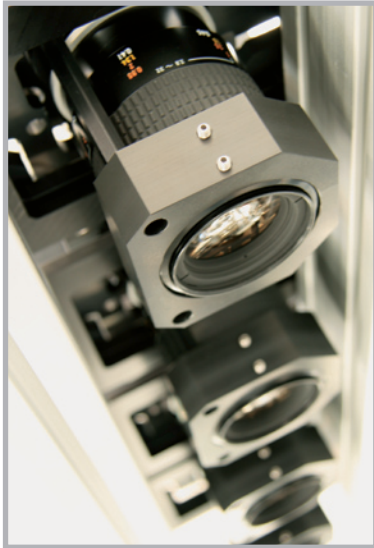
In sputtering or vaporisation processes the TCO coating material is deposited onto the substrate such as e.g. glass, polycarbonate, polyester film or acryl.

When applied as a coating TCO and ITO create conductive, highly transparent surfaces. These surfaces partly reflect infrared and ultraviolet rays while allowing visible light to pass. Furthermore, these coatings are characterized by a superior hardness and durability and therefore in addition serve a ideal cover material for sensitive layers of an application set-up.

INSPECTION OF TCO AND ITO LAYERS

To guarantee high electric conductivity and low resistivity, the TCO and ITO layers must be deposited without any defects, contaminations or unacceptable thickness variations (see grey scale images left for typical defect types of TCO/ITO coatings). Manufacturers of coated process material therefore increasingly introduce optical vision systems that specialize on the inspection of coating materials.

TCO COATING



Dr. Schenk's Vision Systems convince by their advanced image processing based on ultra high speed cameras and sophisticated illumination

**ITO INSPECTION WITH VISION SYSTEMS
BY DR. SCHENK FOR HIGHER YIELD**

Dr. Schenk, leading manufacturer of high precision inspection systems for various industries, offers an innovative technology that help you to:

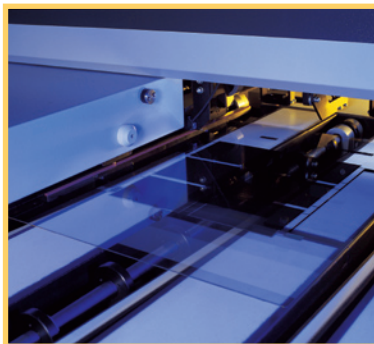
- Establish consistent quality standards by reject products from the further production process that do not meet these standards
- Improve yield by quickly identifying the source of a defect and eliminate the problem rapidly
- Gain in-depth knowledge of the production process by quality documentation, history and statistic reports

Dr. Schenk offers TCO/ITO inspection for various applications. The systems are each specialized for the specific requirements of the inspected material:

Film, Foil and Web Material → **EasyInspect**

Coated Sheet and Float Glass → **GlassInspect**

Thin Film Solar Modules → **SolarInspect**



Dr. Schenk GlassInspect system: Optimal adjusted and highly flexible design

KEY FEATURES

- Easy to integrate into production lines
- User-friendly interfaces according to SEMI standards
- Reliable and accurate defect classification
- Networking for further evaluation
- Optimal adjusted and highly flexible design
- Latest video processor technology for highest inspection speed and measurement accuracy
- High defect sensitivity with bright-field and dark-field setups
- Precise measurement of optical and mechanical properties, like surface flatness, deformation, or layer thickness

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