

## Coating and sub-surface analysis

### A View under the Cover ...

**Measurement, visualization and detection of coatings, layered structures, delamination, micro-defects or embedded structures in polymers, ceramic or metallic materials and components are of essential interest for quality inspection. Optical Coherence Tomography (OCT) as an advanced technology can deliver such insights. In multimodal settings combined with Infrared (IR) or Raman spectroscopy, both structural and chemical information can be provided for an advanced sub-surface analysis with micrometer resolution.**

Optical Coherence Tomography (OCT) has established itself as a highly relevant non-destructive testing technology. Applied in NDT, OCT can provide valuable structural information for different polymer, varnish, or other types of coating. The gained insights about quality or composition at a scale of several microns can be used for design and quality control of novel materials. The OCT technology reaches a resolution of a few microns and a penetration depth of some millimeters, depending on the scattering and absorption properties of the material investigated.

The structural information of OCT can be complemented by chemical information provided by IR or Raman spectroscopy, which can be arranged in multimodal measurement

settings, combining OCT and spectroscopic technologies in one measurement device.

Sometimes, either structural detection or chemical measurement may be a possible solution to measure, e.g. the thickness of a paint layer/coating or oxygen barrier layers (e.g. EVOH) in a multilayer polymer film.

Partly, these methods can also be enriched by polarization-sensitive configurations which enable to obtain information about optical anisotropies, like birefringence. This information gives hints about internal strain-stress conditions. Extending probing light sources from VIS and NIR range towards MIR and THz allows for novel applications, like testing of thin ceramic layers and therein embedded structures, e.g. electronic components.

### Facts/Key-Values/ Features & Benefits

- Non-destructive and contact free
- Accurate in-line thickness measurements
- Harmless non-ionizing radiation
- 3D imaging & hyper-spectral imaging
- Novel insights in material functionality
- Information about chemical composition

### Potential Users Fields of Application

- Quality inspection and process monitoring
- Packaging, pharmaceutical or ceramics industry
- Health care and cosmetics industry

### Status – what do we offer?

- Feasibility studies, measurements
- R&D for probing and sensor configuration
- Consulting for your specific measurement and testing tasks
- Development of customized measurement solutions

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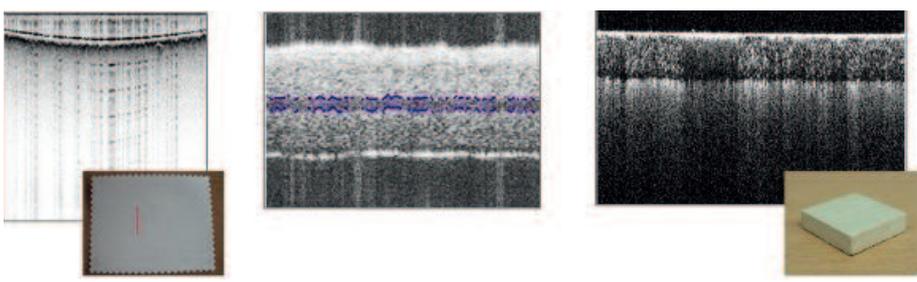


Figure: OCT cross-sectional images of coated/multilayer structures, showing: (left) glue layer on stamp; (middle) EVOH layer in multi-layer polymer structures; (right) varnish coated ceramics.