



Fraunhofer ITWM

FRAUNHOFER INSTITUTE FOR INDUSTRIAL MATHEMATICS ITWM



ENGINEERING PLASTICS

1 + 2 *Plastic components for vehicle interiors or foils and pipes can be tested contact-free and non-destructively using terahertz measurement technology.*

Non-destructive testing using terahertz measurement techniques

The testing of plastic components makes high demands on the selected test procedure. Terahertz measurement techniques allow measurements on the surface and in the bulk material. Terahertz measurements are contact-free and do not require any additional coupling medium, thus avoiding the not-uncommon problem of residue removal. In contrast to contact-free X-ray techniques, terahertz measurement techniques achieve better image contrast with these materials – and present no health risks. Variations in thickness, defects, cavities, inclusions and pores can be reliably and clearly detected using terahertz measurement technology

The benefits

- Contact-free: the specimen does not come into contact with any coupling medium
- Specimens with internal cavities can be analyzed
- Inspection of metal/plastic combinations
- Measurement in transmission and reflection configuration
- Simple integration of compact measurement modules into existing production and quality systems

The system

- Robust design with long-term stability
- User-friendly operator and analysis interface
- Can be easily tailored to the measuring task

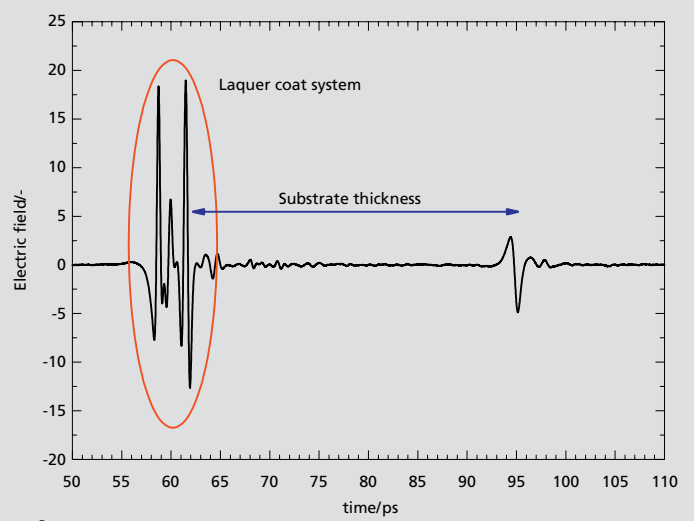
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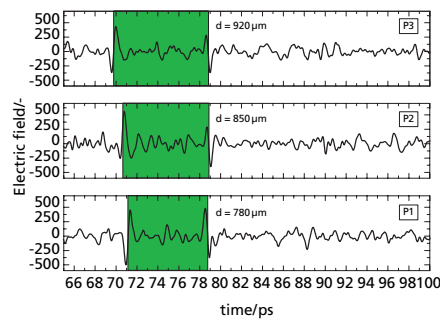
3 + 4 Tracking down defects: multi-layered system on plastic can be measured

Inspection of plastic components

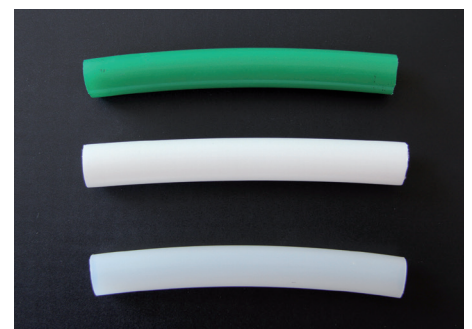
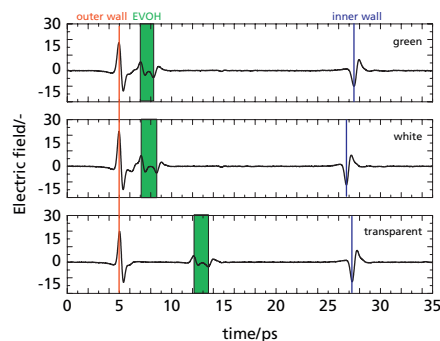
- Detection of
 - inhomogeneities
 - cracks
 - cavities and defects in the bulk material
- Measuring the thickness of
 - plastic components
 - coatings on plastics

Our offer

- Consultation – on technology and application aspects
- Initial tests – free measurements in our application lab
- Feasibility studies – technically and economically
- Equipment rent – for limited-period tasks
- Measuring studies – for industry and research
- Development – from single components to individual complete systems
- Measurements on customer's site – with mobile systems on any large objects



Measurement of airbag cover as an example of engineering plastics: The thicknesses of the predetermined breaking point can be measured.



PE tubes with diffusion barriers made of EVOH. The two upper tubes consist of PE-RT, the tube at the bottom is made of PE-Xb. The position and thickness of the diffusion barrier can be determined exactly irrespective of the coloring.