TECHNOLOGY
OFFER

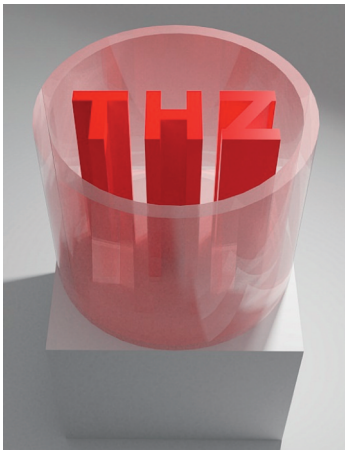
RECENDT
RESEARCH CENTER NON DESTRUCTIVE TESTING

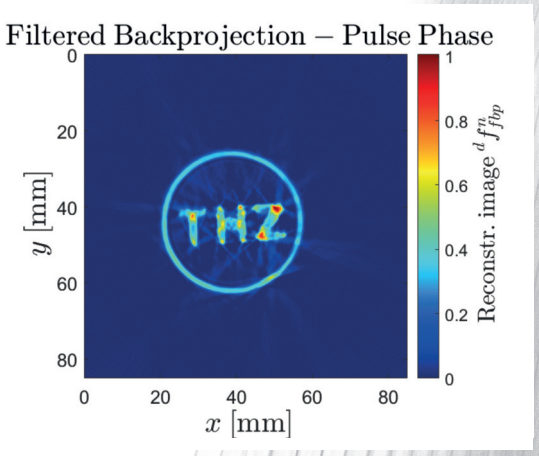
Terahertz Computer Tomography for Non-Destructive Testing

Reveal hidden features – without harmful radiation

Computed tomography (CT) allows to virtually reconstruct a 2D profile or a 3D object using a computer-aided tomographic process, usually based on X-ray radiation. Similarly, objects can be scanned using safe Terahertz (THz) radiation. We offer an innovative, contactless and non-destructive way of conducting quality control using THz-CT, producing accurate thickness evaluation and detection of hidden defects.

Typical objects suitable for investigation using THz-CT are elongated 2D objects or "profiles" (e.g., window profiles or rubber seal) made of non-metallic materials such as plastics, wood, rubber, ceramic, etc. However, objects with other geometries can be investigated as well. THz radiation penetrates up to several centimeters into or through objects depending on the material, allowing to detect defects such as wrong wall thickness, holes, pores, voids or inclusions. This type of non-destructive testing is non-ionizing and thus does not require shielding for the operator. In addition to CT, the setup can easily be reconfigured to carry out fast THz imaging and spectroscopy. This is particularly interesting in the case of flat objects, e.g., for characterization of multi-layer plates or for detection of features under a flat surface.





Facts/Key-Values/ Features & Benefits

- Reconstruction of 2D profiles and 3D objects
- See through several centimeters of material (especially polymers)
- Hidden feature / defect detection
- Layer thickness estimation with accuracy better than 0,15 mm
- Contactless, non-destructive and safe measurement method

Potential Users & Fields of Application

- Plastic/rubber/ceramic/wood products
- Quality control
- Process optimization

Status – what do we offer?

- THz-CT measurements
- Fast transmission and reflection THz measurements
- Fast THz imaging and spectroscopy
- Measurements in RECENDT Labs
- Solution tailored to customer's needs

Contact data

Robert Holzer
robert.holzer@recendt.at
+43 732 2468 4602

References, Publications

Fosodeder, P., Hubmer, S., Ploier, A., Ramlau, R., van Frank, S., & Rankl, C. (2021). Phase-contrast THz-CT for non-destructive testing. Optics Express, 29(10), 15711. https://doi.org/10.1364/OE.422961

Fosodeder, P., van Frank, S., & Rankl, C. (2022). Highly accurate THz-CT including refraction effects. Optics Express, 30(3), 3684. https://doi.org/10.1364/oe.444151

Member of UAR INNOVATION NETWORK

upper austria

Development supported by the Austrian COMET-project PSSP (FFG contract number #871974)