

TeraTec – Application Center Terahertz Technology

- **Expertise**
TeraTec combines all the relevant techniques and systems from one partner.
- **Tailor-made terahertz solutions**
TeraTec develops systems and applications to customer's requirements.
- **Ideal terahertz partner**
The Fraunhofer experts at TeraTec act as service providers and speak the industry's language.

TeraTec – the offer

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

Fraunhofer Institute for Industrial Mathematics

TeraTec – Application Center for Terahertz Technology

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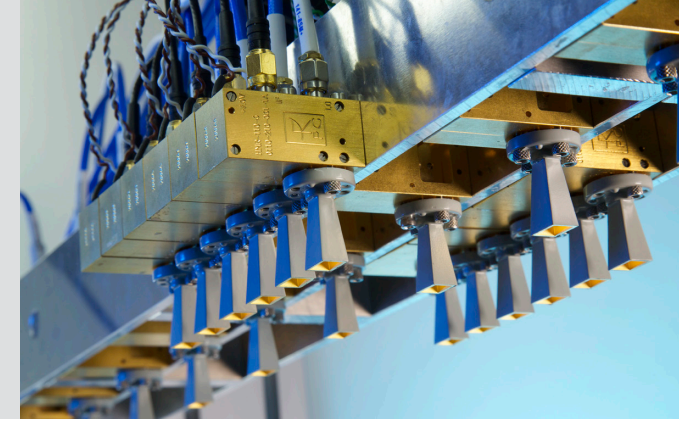
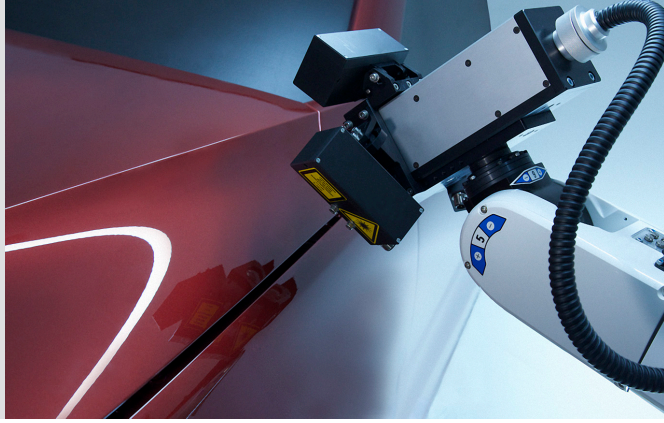
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TERATEC – APPLICATION CENTER FOR TERAHERTZ TECHNOLOGY





WHAT ARE TERAHERTZ WAVES?

The terahertz range is the last great challenge in the electromagnetic spectrum. With frequencies between 0.1 and 10 Terahertz (THz), this spectral range lies between microwaves and infrared radiation, resulting in wavelengths of 3 mm to 30 μm .

Terahertz – a spectral range with potential

Terahertz waves unite the advantages of the two neighboring spectral regions: high penetration depth and low scattering combined with good spatial resolution are characteristic properties of terahertz waves. Unlike UV radiation or X-rays, for example, terahertz waves do not change the chemical structure. Consequently, they are not harmful to humans.

New, efficient components

Due to advances in laser development and improved manufacturing techniques in ultrahigh-frequency electronics, new, efficient sources and detectors for terahertz waves are developed. First applications in laboratory diagnostics and quality control, process monitoring or safety engineering have been field-tested – with promising results.

INDIVIDUAL SOLUTIONS

At TeraTec we utilize the benefits of terahertz waves for our customers. Together we develop solutions for a broad range of measurement tasks, providing you with a competitive advantage:

Contact-free inspection

- Layer thickness
- Foreign substances
- Moisture
- Hidden structures
- Delamination
- Adhesive bonds
- Inhomogeneities
- Defects

Non-destructive materials characterization

- Degree of purity
- Mixtures
- Conformation
- Polymorphism
- Isomers
- Differentiation between amorphous and crystalline structures
- Charge-carrier mobility and concentration in semiconductors

TERATEC – EQUIPMENT

At TeraTec, we offer you the following measurement systems

- **Imaging broadband terahertz time-domain spectrometer** – for measurements in reflection and transmission
- **Diode-laser-based terahertz system** – for spectral high-resolution spectroscopy
- **Fast, broadband ASOPS terahertz spectrometer** – for the investigation of fast processes
- **Imaging FMCW terahertz systems from 100 GHz to 800 GHz** for fast imaging in reflection and transmission
- **Network analyzer** – for high-precision sample characterization

On-site, we support you with mobile systems

- **Mobile broadband terahertz spectrometer** – for spectroscopic investigations
- **Mobile fibre-coupled broadband terahertz spectrometer** – for flexible measuring tasks
- **Mobile fully electronical terahertz system** – for imaging applications