



- 1 *Module with ultrasound transducers.*
- 2 *Ultrasonic wave travelling through a cell interconnector.*

ULTRASONIC CHARACTERIZATION OF SOLAR MODULE COMPONENTS

Competencies

- Non-destructive interconnector material characterization
 - ⇒ yield strength
 - ⇒ Young's modulus
 - ⇒ mean grain size
 - ⇒ anisotropy / grain orientation
 - ⇒ geometry
- Non-destructive foil material characterization
 - ⇒ coupling to glass
 - ⇒ cross-linking / curing progress
- Non-destructive glass material characterization
 - ⇒ Young's modulus
 - ⇒ thickness measurement
- Development of new ultrasonic measurement techniques and device development for inline automated testing

Approach

Reliability of photovoltaic modules is a key factor for being financially attractive for customers all over the world. The reduction in manufacturing costs lead to increased demands on module components to maintain acceptable mechanical yields. Thus fast, economic and preferably non-destructive component characterization and manufacturing process control methods come more and more into focus.

At Fraunhofer CSP ultrasonic approaches for material characterization of photovoltaic module components are evaluated and compared to conventional mechanical testing and microstructural analysis. New ultrasonic measurement techniques for research and industrial quality insurance are developed and tested.

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