3D SURFACE METROLOGY SYSTEMS FOR RESEARCH AND PRODUCTION

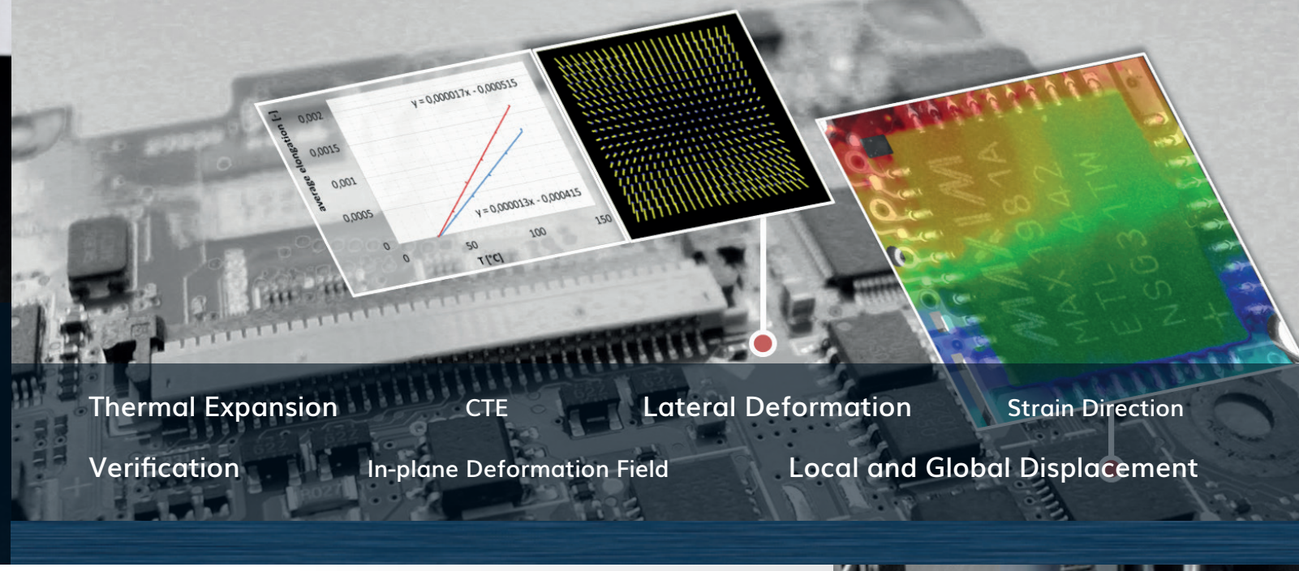
FRT THE ART OF METROLOGY™

MicroProf® TL

Optical Metrology under Thermal Load

MEASURING TASKS

Roughness *Step Height* *Profile* *Waviness* *3D Map* *Thickness*
Warp *Slope* *Topography* *Flatness* *Vias / TSV* *Bumps*
Co-planarity *Bow* *...*



STANDARD CONFIGURATION

Characteristics

- temperature control 10°C[1]/ -80°C[2] to 400°C
- fast heating- and cooling rate
- homogeneous temperature distribution on surfaces
- FRT topography sensor(s)
- housing in modern industrial design
- stable granite construction with excellent damping properties
- CWM deformation sensor optional

1 with CDA cooling accessory
2 with liquid nitrogen cooling accessory

Applications

- FRT Acquire Automation XT
- PCB-design and simulation
- 3D-IC, MEMS, wafer stacking
- failure analysis

The **MicroProf® TL** is the latest family member of the **MicroProf® TL** Series. Like any other **MicroProf®**, the '**TL**' (Thermal Load) is an optical surface measurement tool for fully-automatic 3D surface measurements for several applications. In difference to its family members, the TL features a Thermo Unit - a fully-integrated heating and cooling stage - as well as a microDAC 2D deformation sensor by CWM. By these means, **MicroProf® TL** can be used to characterize lateral and vertical deformation of samples under thermal load. This can be used to determine the behavior of components under 'working condition' or to simulate various process steps. For the relevant measurement process random terminal cycles can be configured by an easy recipe creation.

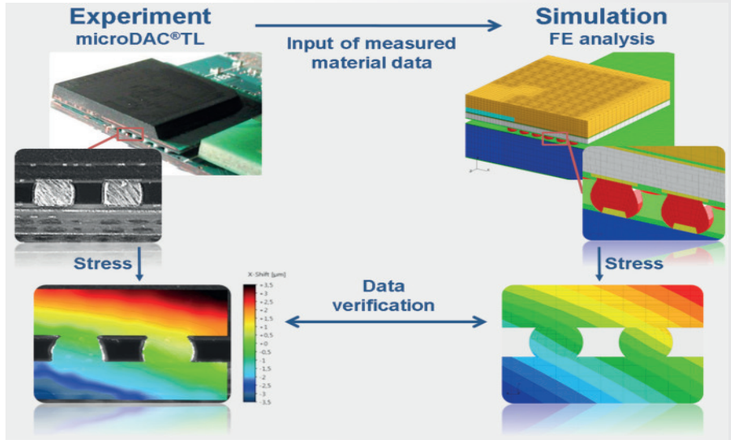
In combination with the FRT software Acquire Automation XT the **MicroProf® TL** is able to run fully-automatic temperature profiles. In the recipe, the user can set target temperatures, temperature ramps and dwell time that will be used during process. Set points can be defined where topography and deformation measurements take place within the heating/cooling process. Permanent temperature logging is available, optionally, a second temperature probe can be added in order to monitor the temperature at special locations on the sample.

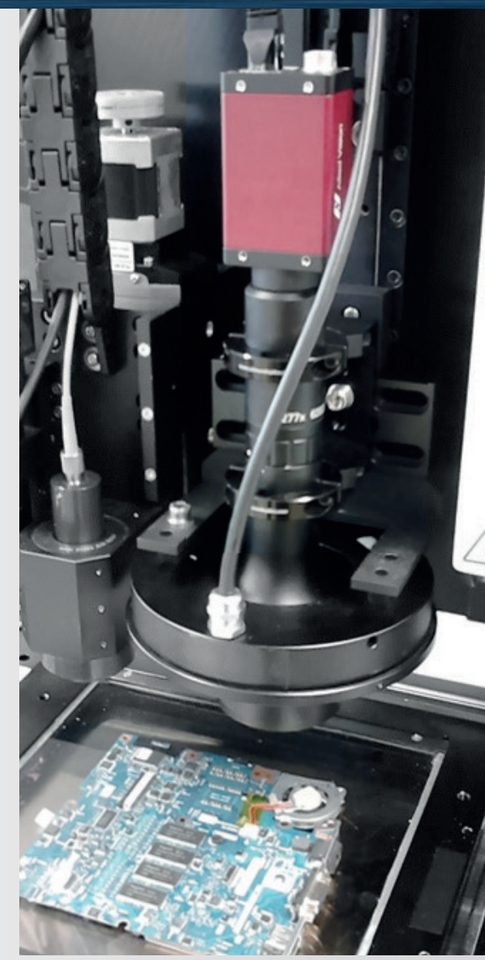
ADD-ON SYSTEM MICRODAC®TL FOR IN-PLANE MEASUREMENTS

Additional to out-of-plane measurements (warpage) microDAC®TL allows the investigation of in-plane displacements from single electrical components up to complete assemblies. With the high- precision camera setup global and local deformation fields can be measured with an accuracy up to 50 nm.

Area of application is the detection of weak points of electronic assemblies during internal or external load, like for example temperature driven deformations or distortions by mounting.

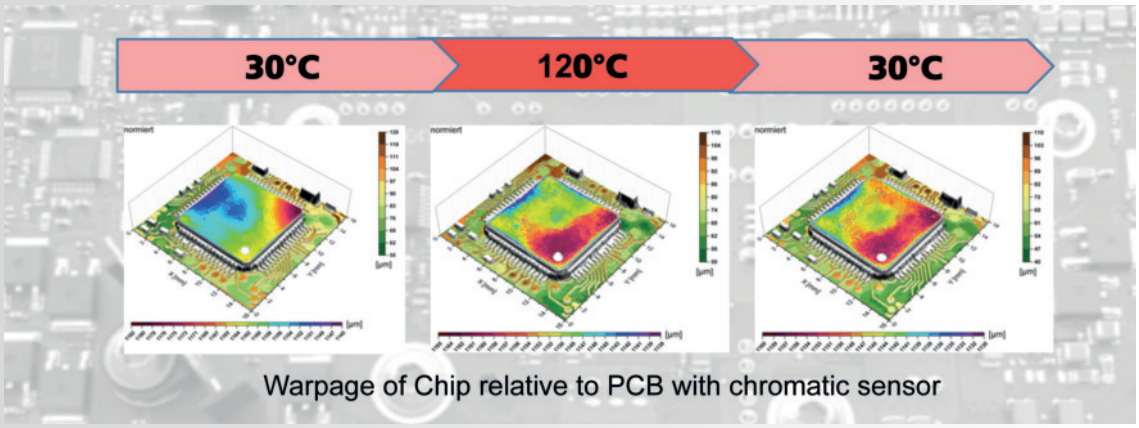
Especially, in conjunction with the numerical simulation the system is very beneficial. Both, thermo-mechanical material data (CTE) can be determined as input for the simulation as well as the simulation results can be verified by means of the deformations.

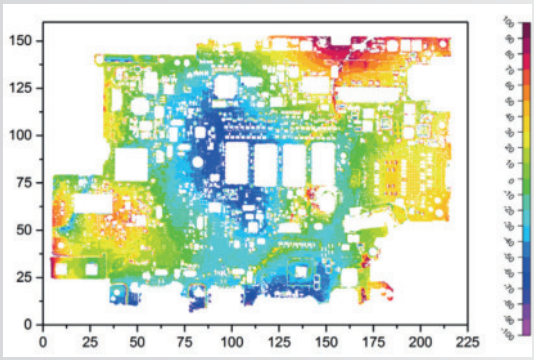




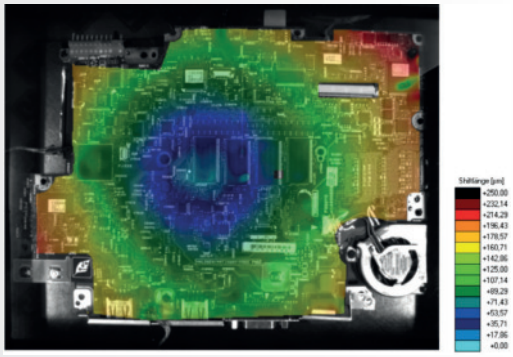
Chemnitzer Werkstoffmechanik GmbH
www.cwm-chemnitz.de

TOPOGRAPHY MEASUREMENT OF AN IC COMPONENT:





Out-of-plane deformation field (Warpage) with chromatic sensor



In-plane deformation field with microDAC® TL

SOFTWARE

- FRT Acquire
- FRT Acquire Automation XT
- FRT Mark III
- CWM VEDDAC control
- CWM VEDDAC

Optional:

- SECS/GEM interface
- CWM VEDDAC control
- CWM VEDDAC

HARDWARE

- FRT topography sensors
- FRT Thermo Unit
- Optional:
- CWM: In-plane deformation tool microDAC®TL

Questions? Talk to an expert!

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