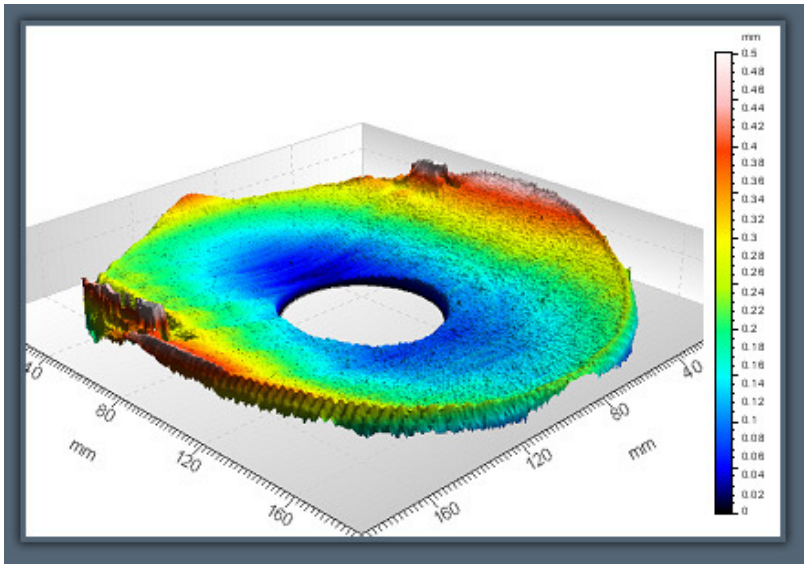
APPLICATION FILE
NON ELECTRONIC APPLICATION

TDM
TOPOGRAPHY AND DEFORMATION MEASUREMENT

TDM, due to its modular concept, its robust topography acquisition algorithm, and its large free space for sample positioning has an application range far beyond the limits of electronics components and assemblies.
In fact, the TDM optical setup operates without any equipment close to the sample (no lens, mirror, grating or others close to the sample). Therefore, the size of the samples to be inspected is virtually unlimited. The sample size limitations indicated for the standard systems are only due to mechanical structure limitations, like projector supports, or system housing. Therefore, customization to larger sample sizes is easily feasible.
Furthermore, though the TDM standard system is equipped with powerful IR heating lamps, customization of the system with other heat or mechanical stress generating tools is feasible, allowing for high resolution topography and deformation analysis under a great variety of stress impacts on the sample.
The following examples illustrate two TDM applications outside the world of electronics.

Heating plate

When cooking on stoves with electric heating plates, optimum heating performance is only obtained in case of a large and uniform contact surface between heating plate and the casserole base. Therefore, from the thermal standpoint, the principal technological challenge in the design of this type of equipment consists of building round metal structures with relatively large diameter which remain as flat as possible for all temperatures ranging from room temperature and some hundred degrees Celcius.



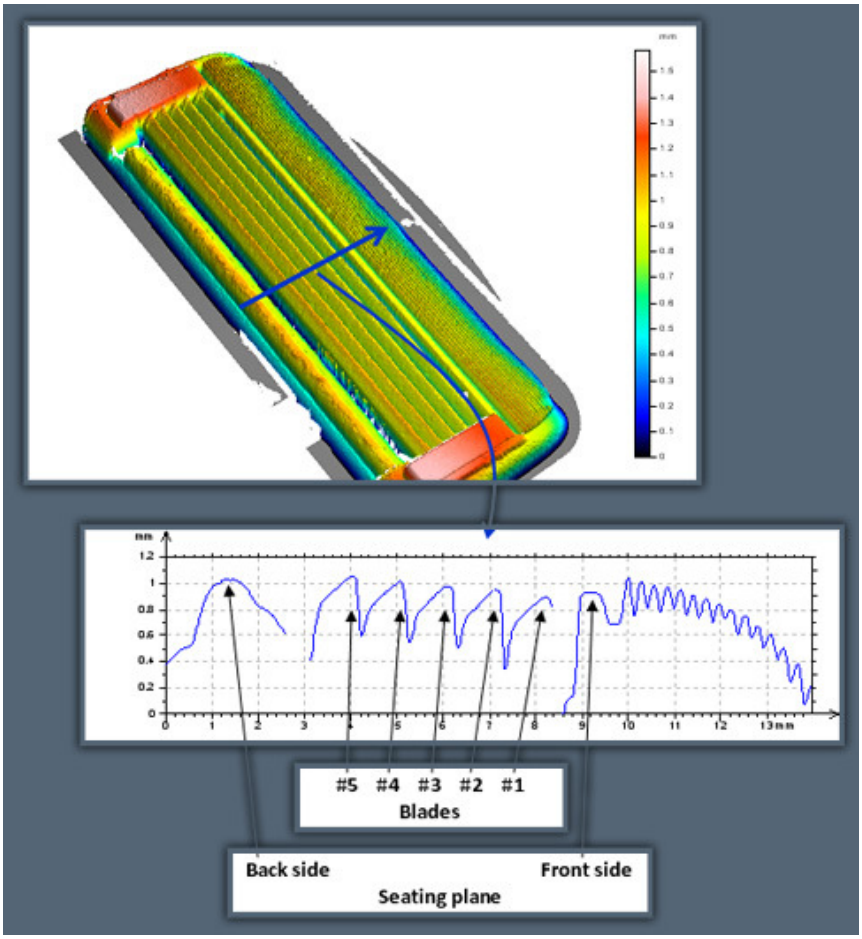
Topography of the heating plate of an electric stove, at 400°C, acquired by TDM on an operating heating plate (no external heating). The two image distortions on back and front side of the plate are due to the presence of 2 thermocouples for temperature measurement.

TDM is well adapted to this type of R&D work, thanks to its modular design allowing for maximum system customization depending on the specific measurement task:

- ***Topography analysis on operating samples, like stove plates, pressing irons, or PC main boards***
- ***Additional application of external thermal and/or mechanical load possible independently from the TDM integrated heat generation by IR lamps***
- ***Sample size up to 400×400×200mm. Customization for even bigger samples possible.***

Razor blades

Other TDM applications concern the follow up of highly structured topographies with fine details, which are subject to deformations by small temperature changes, humidity variations, or contact pressure. The following image shows the topography of a razor with 5 successive blades. The TDM high resolution topography reveals the razors fine structure in great detail.



For further analysis of the blade structure, a 2D profile perpendicular to the blades may be extracted, following the blue arrow indicated in the 3D image. Potential further assessments may include:

- *Alignment of the 5 blades*
- *Linear and angle offset of the blades with respect to the razor's seating plane*
- *Variation of the blade topography after 1, 2, … n applications of the razor*
- *Variation of the blade topography with temperature, humidity, contact pressure*