

Application Note *TOP-01*



FIELD OF APPLICATION

- VIB
Vibration Measurement by Laser Doppler Vibrometry
- LSV
Speed and Length Measurement by Laser Surface Velocimetry
- TOP
Surface Topography Measurements by White Light Interferometry

Non-destructive Quality Control for Hard Disk Components using the TopMap White Light Interferometer

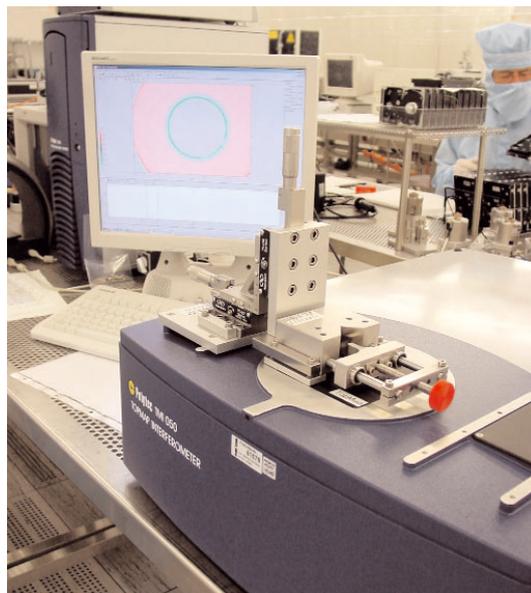
The classic contact stylus profilometer is not the best tool for measuring the surface topography of a component with a sensitive, high-quality surface finish since the stylus can damage the surface it is measuring, rendering the measurement and the component unusable. In contrast the TopMap scanning white light interferometer enables non-destructive topography and evenness measurements on surfaces up to 30 mm x 40 mm, with a vertical resolution of 10 nm.

Surface Quality of Fluid Dynamic Bearings

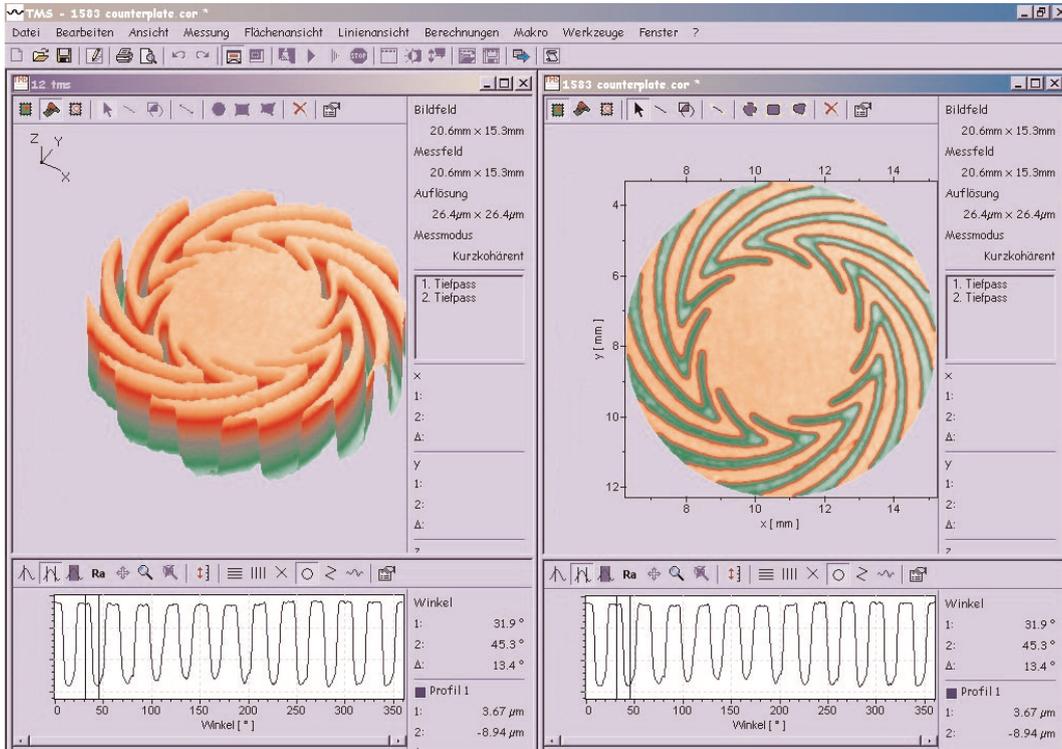
A manufacturer of various components for hard disk drives such as bearing sleeves, shafts and disk hubs, uses TopMap systems for quality control along with several other measurement techniques. The quality of fluid dynamic bearings (FDB) which have appeared on the market in recent years as an alternative to ball bearings are of particular interest.

Measurement Example

The sample shown in the figures is a grooved counter plate from an FDB positioned over the TopMap measurement area with the aid of a special mount. Once positioned, the TopMap can then determine the existing topography of the complex grooved surface with nanometer accuracy.



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Laser Measurement Systems
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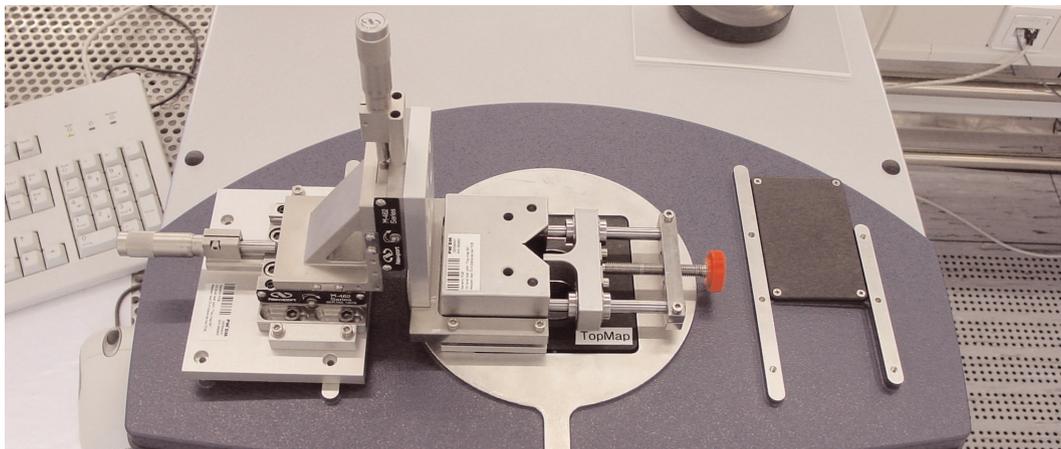
To measure the quality of the component, a cross-section along a circular line is analyzed for separation, width and depth of the steps. The results are visible in the lower part of the figure.

Conclusions

This measurement benefits from the TopMap's telecentric imaging optics which measures the object with parallel light. In contrast to other

measurement processes, this allows you to accurately test components with indentations, drill holes, steps and edges.

The TopMap white light interferometer has proven its value to the company for their offline production quality control testing requirements. Their future plans include in-process, production line control with the TopCam system, an industrialized version of the TopMap technology designed for production process inspection.



For more information about surface metrology by Polytec please contact your local Polytec sales/application engineer or visit our web pages

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