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

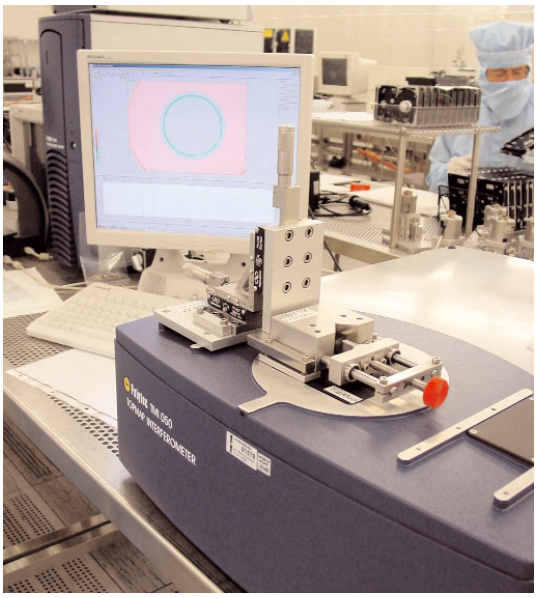
The classic contact stylus profilometer is not the best tool for measuring the surface topography of a component with a sensitive, high-quality surface finish since the stylus can damage the surface it is measuring, rendering the measurement and the component unusable. In contrast the TopMap scanning 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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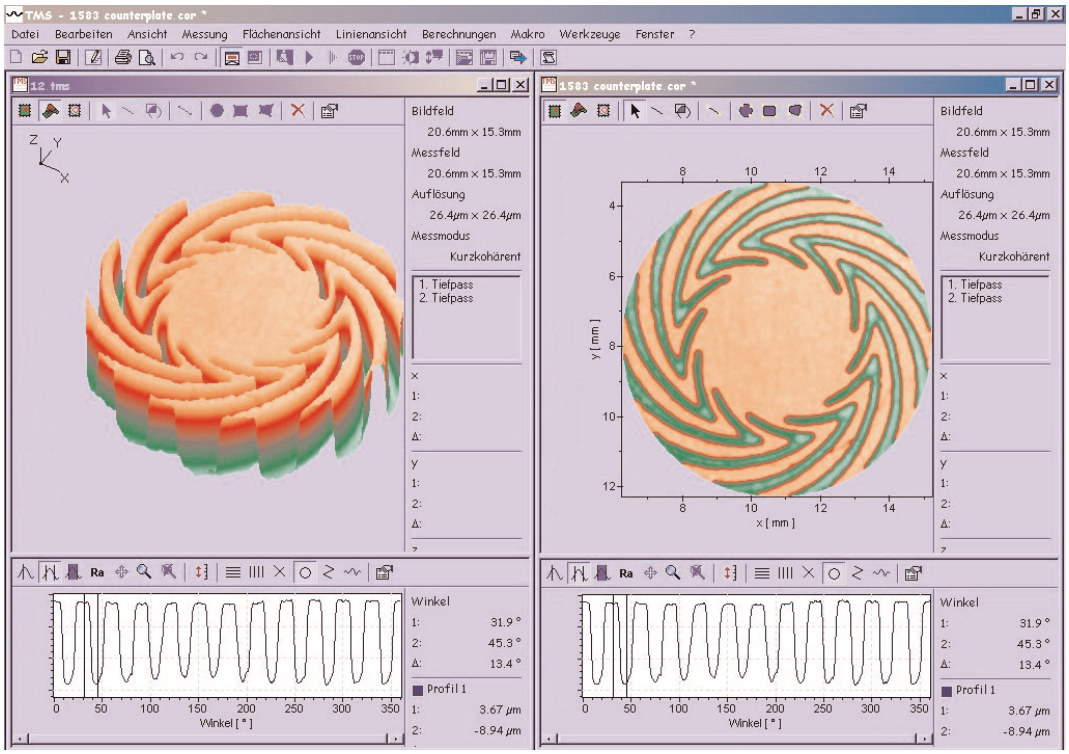
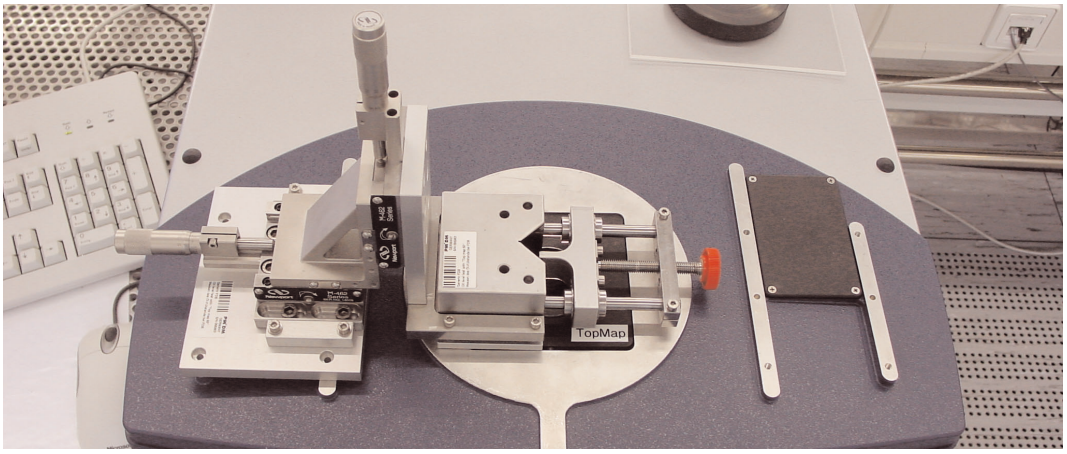


To measure the quality of the component, a cross-section along a circular line is analyzed for separation, width and depth of the steps. The results are visible in the lower part of the figure.

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

www.topmap.info or **www.polytec.com/usa/topmap**

Polytec GmbH (Germany)
Polytec-Platz 1-7
76337 Waldbronn
Tel. + 49 (0) 7243 604-0
Fax + 49 (0) 7243 69944
info@polytec.de

Polytec France S.A.S.
32 rue Délizy
93694 Pantin Cedex
Tel. + 33 (0) 1 48 10 39 3 0
Fax + 33 (0) 1 48 10 09 66
info@polytec.fr

Polytec Ltd.
(Great Britain)
Lambda House, Batford Mill
Harpenden, Herts AL5 5BZ
Tel. + 44 (0) 1582 711670
Fax + 44 (0) 1582 712084
info@polytec-ltd.co.uk

Polytec Japan
Hakusan High Tech Park
1-18-2 Hakusan, Midori-ku
Yokohama-shi, 226-0006
Kanagawa-ken
Tel. +81 (45) 938-4960
Fax +81 (45) 938-4961
info@polytec.co.jp

Polytec, Inc. (USA)
North American Headquarters
1342 Bell Avenue, Suite 3-A
Tustin, CA 92780
Tel. +1 714 850 1835
Fax +1 714 850 1831
info@polytec.com

Midwest Office
3915 Research Park Dr.
Suite A-12
Ann Arbor, MI 48108
Tel. +1 734 662 4900
Fax +1 734 662 4451

East Coast Office
25 South Street, Suite A
Hopkinton, MA 01748
Tel. +1 508 544 1224
Fax +1 508 544 1225