



125 years of innovation

Introduction to Taylor Hobson

2013

Introduction to Taylor Hobson

- Taylor Hobson is an ultra-precision technology company operating at the highest levels of accuracy
 - Offering contact and non-contact surface and form metrology solutions for the most demanding applications
 - We offer truly global support, with worldwide sales, technical support and aftermarket service infrastructure
 - 60%+ of our Sales are outside of Europe
- In order to stay at the front of our field we invest heavily in Research & Development
 - We have an extensive portfolio of Intellectual Property
 - Plus a wealth of industry and applications knowledge which has been built up over the past 50 years in Europe, Asia and America

Form Talysurf



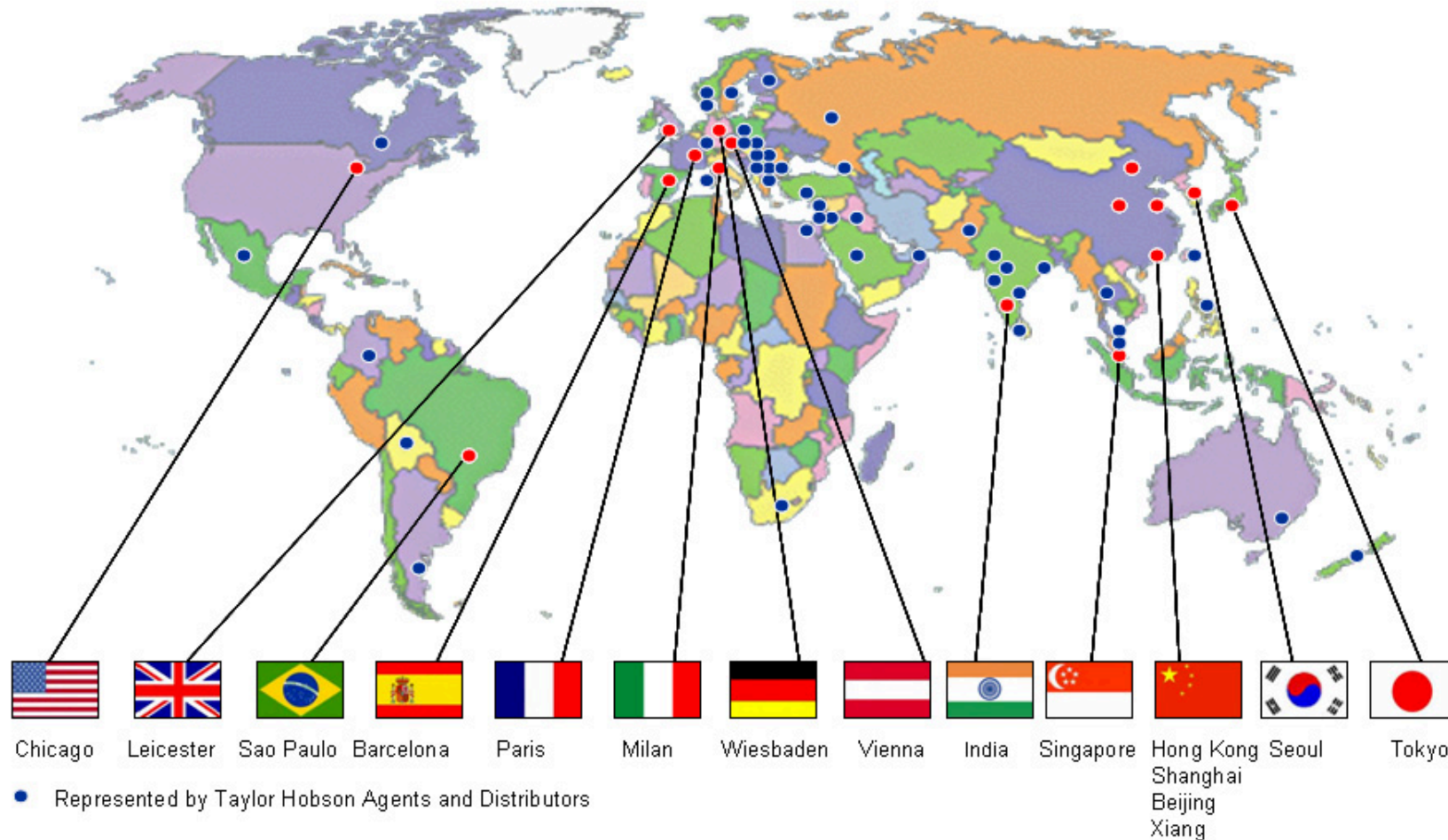
Talysrond

Global Excellence in Metrology



Celebrated 125th Birthday in 2011

Founded 1886 in Leicester, England



Local support from a global company

Global Excellence in Metrology



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ULTRA PRECISION TECHNOLOGIES

Operational Excellence **demanding the best**

All critical parts made by Taylor Hobson

- New Investments
 - 2002 - **Mori-Seiki MT 2000** - One hit machining of critical mill/turn components
 - 2003 - **Matsuura 405 Horizontal milling machine** - Reduced set up times & faster
 - 2007 - **Pallet pool system for Matsuura** - support unmanned running
 - 2008 - **Daewoo MX2500 Mill/Turn centre** - continuing to develop one hit machining
- Barcoding
 - Real time information on WIP throughout manufacture
 - Accurate Work-to lists generated and followed
- Six Sigma Program
 - 4 Champions, 3 Black Belts & 9 Green belts
 - Six sigma steering team meet monthly
- Quality Steering Team
 - Focus on Product Quality and good practice in Product Development
 - “Right First Time” performance is monitored
- ISO 9001:2008 Quality management
 - 16 Key processes with individual owners
- ISO 14001 Environmental management
 - Co-ordinated through environmental team



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Local Service from a Global Company

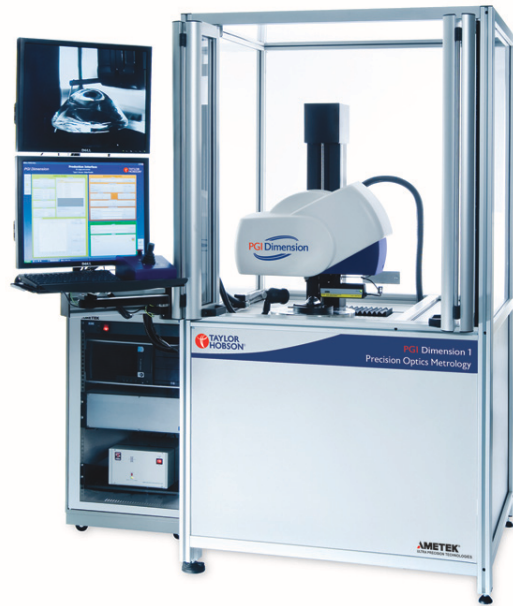


- The Accredited Service Engineer Programme
 - TH Products serviced by fully Accredited TH Service Engineer
 - Accreditation training includes: Metrology; Software; Service best practice; and instrument by instrument training modules
 - Covers TH staff and those of our agents
 - Global knowledge sharing on our bulletin board
 - Remote diagnostics available on instruments
 - 52 fully accredited service engineers worldwide
 - Courses run throughout the year
- Priority Spares – Guaranteed stock globally
 - Spare part forecasting for critical and longer lead time components
 - Local stocking where needed
 - Shipment of critical parts the same day
- The Exchange Programme
 - Immediate replacement, no waiting on repair lead times
 - Instrument up time maximised
 - Fixed pricing, making quotations faster and easier

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Innovative metrology **for demanding applications**



PGI

3D Form & Surface Finish
of Steep Lenses & Molds



TalyMaster

Automatic Roundness
Roughness & Contour



CCI

Non-Contact Film Thickness
3D Flatness & Roughness

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Talysurf CCI HD

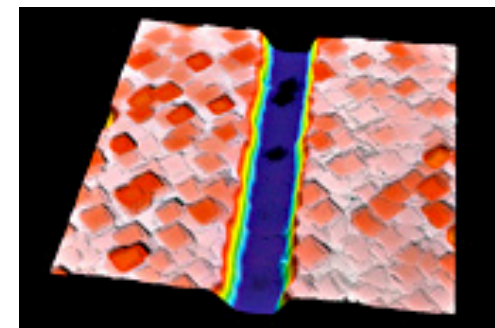
Leading the world in next generation optical profilers

The new CCI HD merges world leading non-contact dimensional measurement capability with advanced thin and thick film technology.

The CCI HD is able to meet the most demanding application challenges, including Optics, 1st and 2nd generation Solar P-V, High power LED, Displays and Vacuum Coated surfaces and precision

The unique features of the CCI HD include:

- Film thickness measurement from 5 μm down to <300 nm
- 4 million pixel camera for high resolution imaging over a large areas
- Auto-range and auto-fringe-find for ease of use
- Single mode of operation over all scan ranges for data you can trust
- Strong, stable and robust closed loop Z scanning mechanism



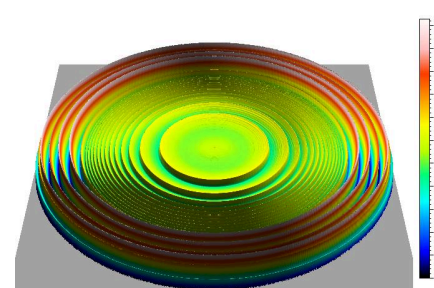
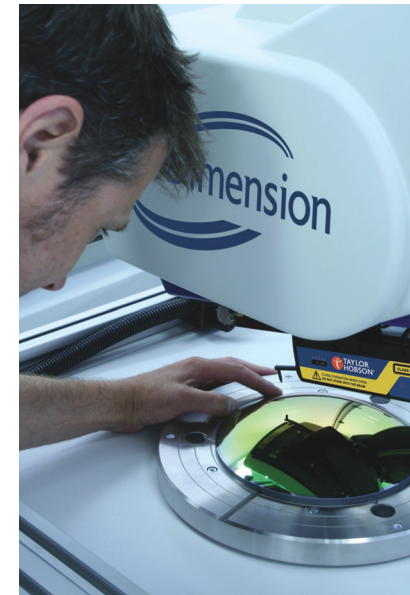
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FTS PGI Optics 3D

World-leading Accuracy without Compromise

- Combining unrivalled accuracy with measurement flexibility, the PGI Optics (3D) sets a new standard in aspheric lens metrology
- Designed to enable lens manufacturers reduce costs and improve quality, from the simplest to most complex lens design. Ideal applications include:
 - Infra red (Thermal imaging)
 - Asphere / asphero-diffractive
 - Cell-phone / Camera lenses
 - DVD pick-up optics (including Blu-ray)
 - Projector / Cinematography
- Key Instrument Features Include
 - Better than $\lambda/10$ precision
 - Fully automatic (ideal for shop-floor use)
 - 3D measurement and analysis
 - Large measurement envelope (up to 200mm)
 - No slope limitation (for high NA optics)

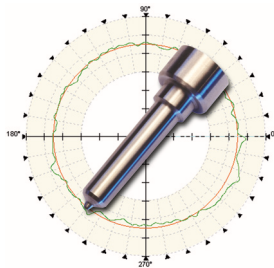


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TalyMaster

A brand new inspection concept for automated metrology



- TalyMaster Features

- Automated multi-part measurement utilising 5 axes of motion
- Roundness, Roughness and Contour measurement on a single platform
- Simple interface allowing fast set up with minimised part handling
- Fully enclosed measurement cell at the point of manufacture

- Multi-featured Parts

- Single components with multiple features can be measured for roughness, roundness & contour

- Multi-Part Measurement

- Many components can be loaded on a single pallet for fully automated inspection

- Advanced Multi-Part Measurement

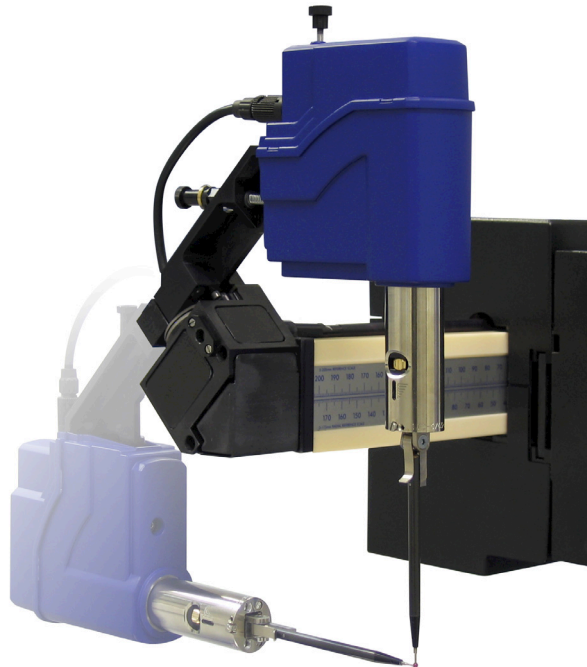
- Many different components can be measured in a single operation

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Innovative Design **for mechanics**

- High accuracy spindle
 - <20nm radial runout
- High accuracy column
 - <0.3um over 500mm
- Fully automated roundness / cylindricity
- Unsurpassed in accuracy and reliability
- Patented Gauge Orientation Mechanism

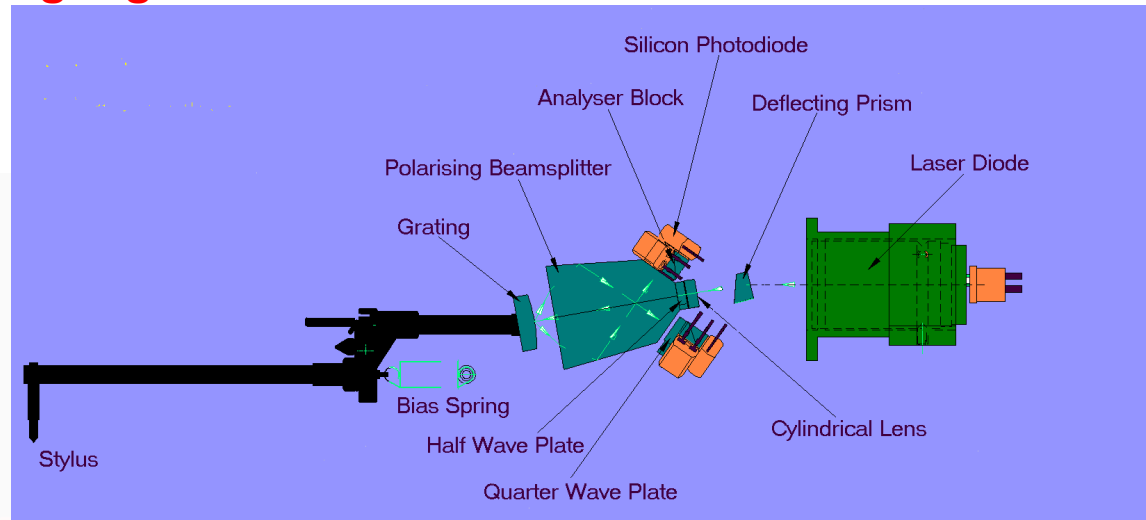
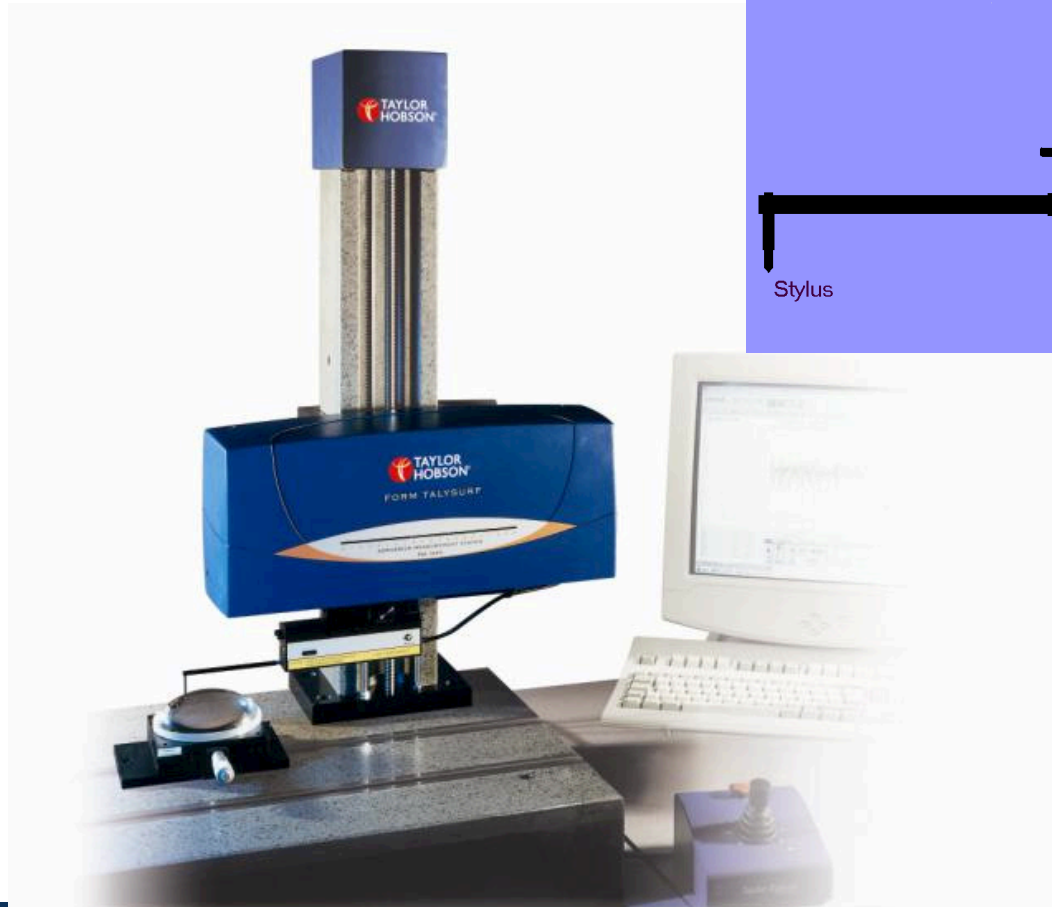


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Innovative Design for gauges

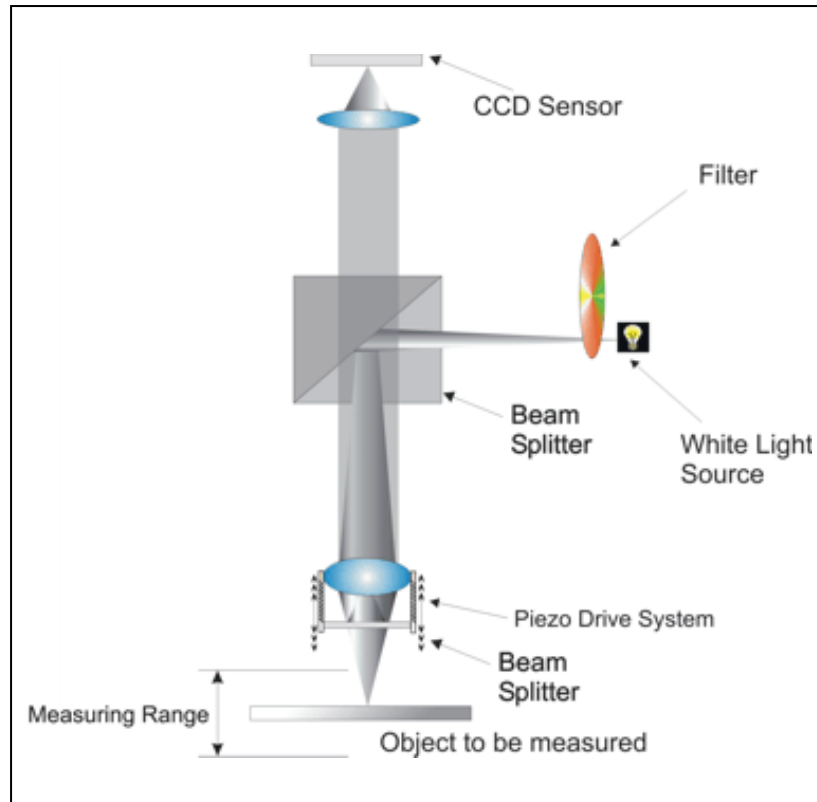


- Contact profilometer
- Patented PGI gauge
- World leading 15 million (range to res)
 - Resolution 0.8nm
 - Range 12.5mm
- System Noise <1nm RMS (Rq)
Straightness <100nm over 200mm
- Patented Ball calibration

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Innovative Design for optics



- Non-contact profilometer
- Patented CCI algorithm
- World leading 1 million data points
 - 10pm resolution
 - 0.1nm step height repeatability
 - 3pm surface finish repeatability
- Patented Flatness Calibration

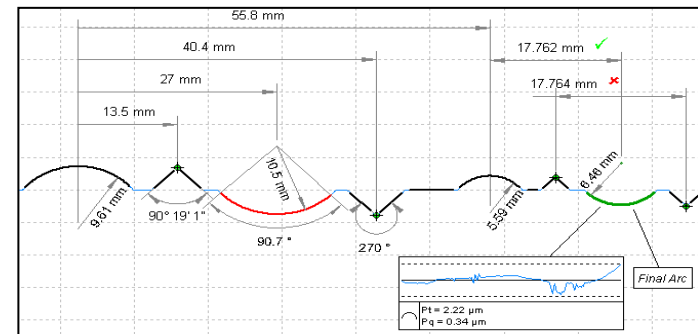
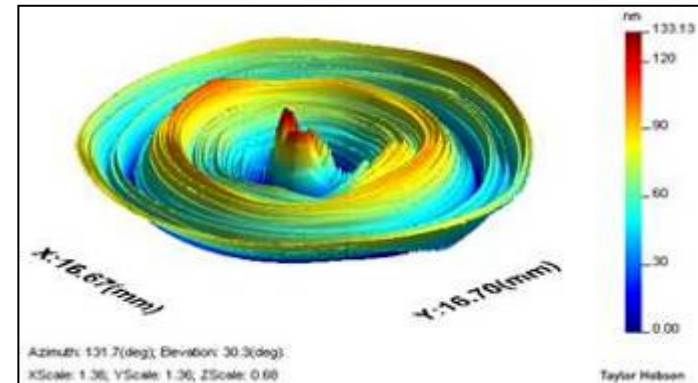
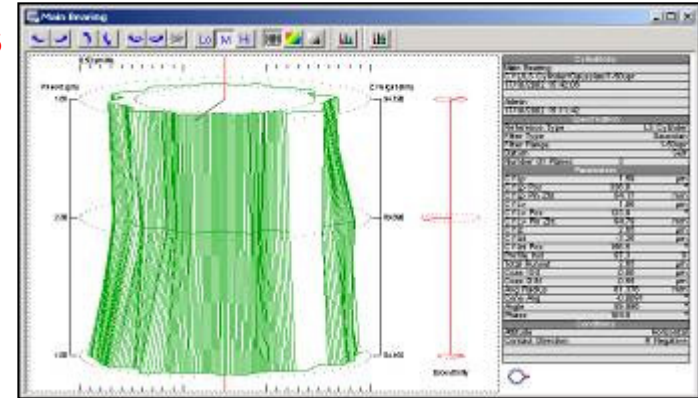


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Innovative software for advanced analysis

- Ultra (2010 - Windows 7)
 - Measurement and analysis of roundness, form and surface finish
 - Designed specifically for windows XP and includes full programmability
- TalyMap (2010 – Version 6)
 - Extensive 3D analysis software for use with non-contact, roundness and surface finish instruments
- TalyMap Contour (new in 2009)
 - Simple to use, fully featured contour package offering geometrical and dimensional analysis of profiles

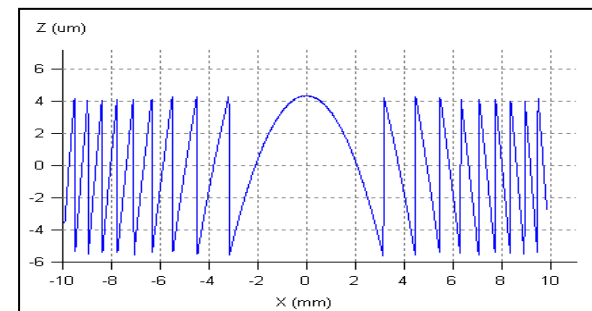
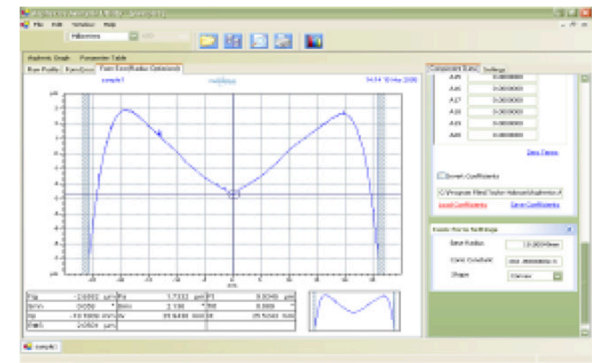
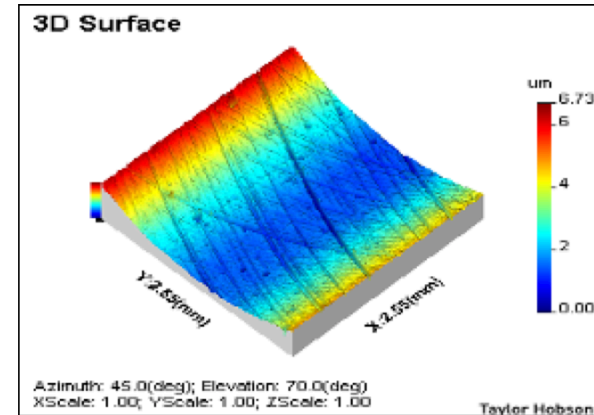


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Software Modules for application solutions

- TalyMap Advanced Modules
 - Extends TalyMap into different application areas
 - Includes automotive, optics, semi-conductor and hard-disk drive applications
- Optics - Aspheric Analysis
 - Analysis to 20th order
 - Derived coefficients capability
- Optics - Diffractive Analysis
 - Extends Aspheric Analysis to asphero-diffractive components.



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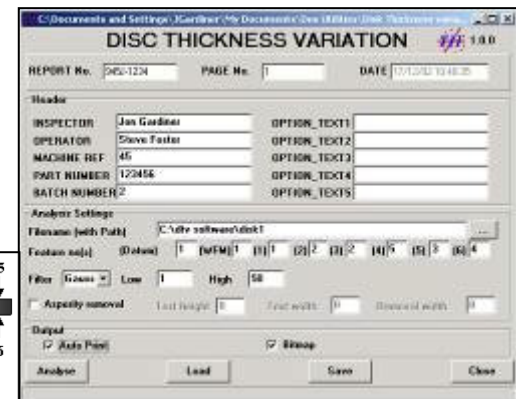
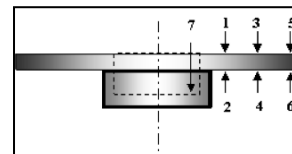
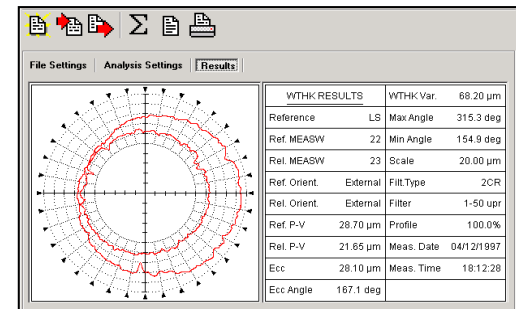
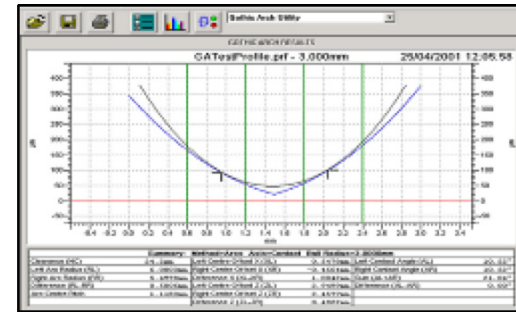


Software Modules for application solutions

- Bearings - Gothic Arch
 - Specialist application for the bearings industry

- Bearings - Wall Thickness Variation
 - Applications to hydraulic and bearing components

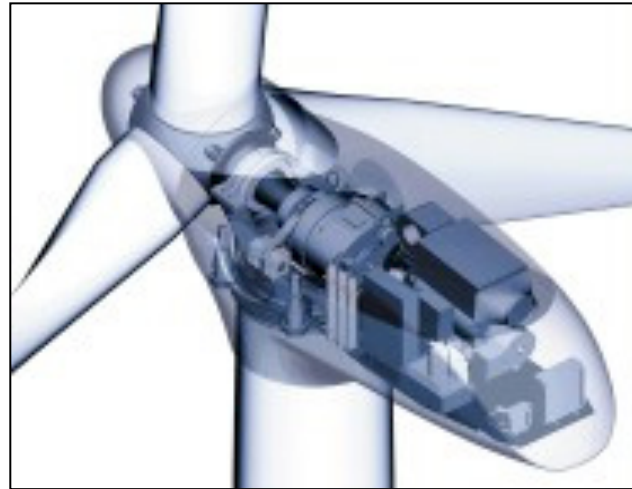
- Brake - Disc Thickness Variation
 - Applications in automotive (brake disc) and hard-disk drive



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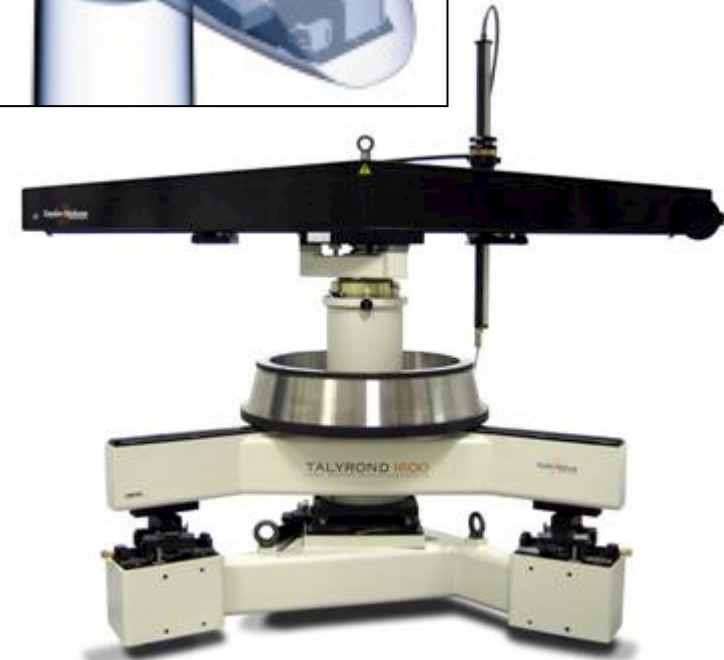
Application Collaboration **wind turbines**



Working with leading manufacturer to develop new metrology solutions

TR 1600 - Large Diameter Bearing System

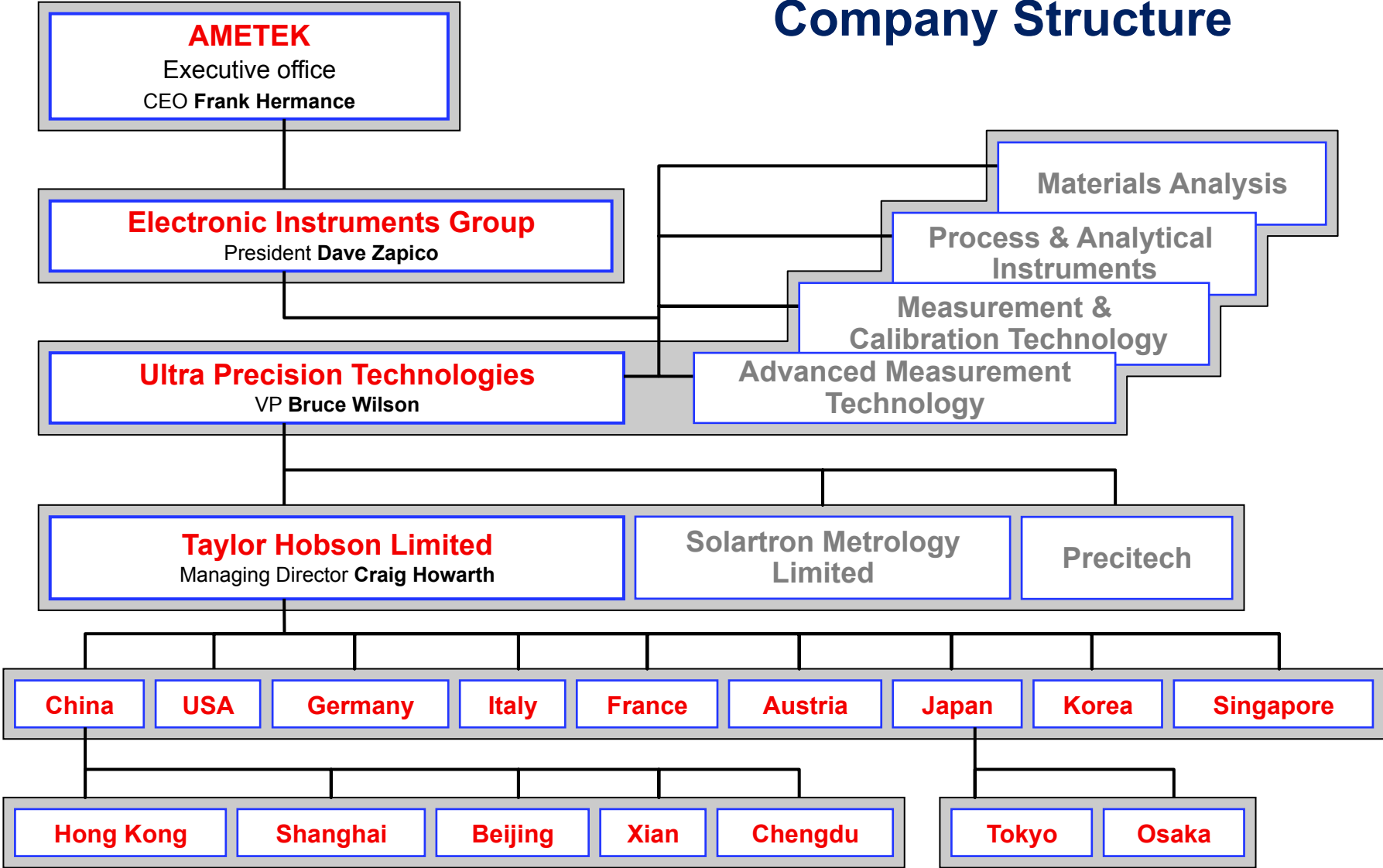
- **System details**
 - For Inner and Outer bearing races
 - Max Dia 1600mm
 - Min Dia 500mm
 - Max Weight 500Kg



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Company Structure



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AMETEK - Overview



- A leading global manufacturer of instrumentation and electromechanical devices
 - \$2.1 billion in annual sales
 - 46% of sales are outside the United States
 - Employs approximately 10,000 colleagues throughout the world
 - Operates more than 80 manufacturing facilities and 80 sales and service centers in the United States and more than 30 other countries worldwide
- New York Stock Exchange listed since 1930 (symbol: AME)
- Component of the Russell 1000 and S&P MidCap 400 indexes

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Our Values

- AMETEK's commitment:
 - Provide world-class products and services at competitive prices
 - Forge beneficial partnerships with customers and suppliers based on fairness and integrity
 - Foster a work environment that treats all colleagues with respect and provides them with opportunities to develop to their fullest potential
 - Provide investors with consistent and superior returns on their investment
 - Remain committed to the highest standards of corporate responsibility and ethical business behavior
 - *For more information about AMETEK, visit our Web site at*
WWW.AMETEK.COM

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Conclusion

- Taylor Hobson is recognised as an innovative market leader in ultra-precision technology
 - Historically our products have been to market first and set the standard that others have tried to emulate
- We set the standard in contact and non-contact measurement solutions being at the pinnacle of accuracy
 - Supporting the most demanding applications with a worldwide infrastructure supporting all geographical regions
- We have well audited quality processes and pursue a programme of continuous improvement
- We use the latest technology and analysis tools to provide world leading products and services
 - We run joint development project with suppliers, customers and academic establishments
- We are the only truly Global ultra precision metrology provider
 - With direct support in USA (80 years), Europe (45 years), Eastern Europe (36 years), Japan (30 years), China (20 years), SE Asia (15 years), Korea (12 years)

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