TAYLOR HOBSON®

Talyrond® 565/585HS

A multi-axis measurement system for single or multi-part measurement

Unparalleled measurement capability

AMETEK®
ULTRA PRECISION TECHNOLOGIES

The Talyrond® 565/585HS

The Talyrond® 500 is the number one choice for manufactures of precision components including bearings, lens moulds, fuel injectors and much more...

The Talyrond® 500 is a world leader in speed, position control and accuracy and has the lowest noise floor of any instrument of its kind. These characteristics combined with the systems unique gauge capability enable measurement of roundness, roughness and contour from a single metrology platform.

With the addition of an automated rotary stage the system can now measure multiple components in a single set up making it truly unrivalled in capability and efficiency.

> "Measurement without compromise"

Complete automation of multi-part measurement, provides cost effective, high volume throughput

The optional rotary stage transforms the Talyrond® 500HS into a multi-part measurement system. This portable device simply sits on the spindle table via three point location and plugs into a concealed socket.

Reproducible measurement results

The rotary stage has a unique counterbalanced design ensuring measurement without any loss of accuracy. Simple control is provided via our Ultra software interface, enabling complete automated measurement of up to 20 parts. This makes the Talyrond® 500HS ideal for the measurement of small components in the bearings, optics, medical and automotive industries.

The new Talyrond® 500HS rotary stage

Gauge	Roundness	Roughness	Contour
Gauge Range Up to 4 mm	**Radial Accuracy** ± 0.01 µm	**Noise** Less than 30 nm Rq all axes	**LS Arc measurement** 5 µm
Resolution Down to 0.3 nm		**Ra values** Less than 0.1 µm	**Pt** 0.5 µm

The new rotary stage transforms the Talyrond® 500HS into a unique, high accuracy, multi-part measurement system

Features and benefits

- The Talyrond® 500HS carries on working after you go home
- Multi-tooling operations and greater flexibility have enabled machining of more complex components while keeping cost to a minimum
- The Talyrond® 500HS combined with the carousel stage has been designed with this in mind, drastically reducing inspection time and minimising operator attendance
- The addition of a calibration artefact onto the carousel removes the need to switch between part and standard further reducing measurement cycle time

Principle of operation

- The user simply loads the carousel fixture, in this example there are twenty components
- The pitch circle diameter of each part passes through the spindle axis meaning each part axis will pass through the spindle axis when the carousel is rotated
- The carousel is rotated to the first component and a centre and level process takes place
- The part can then be measured for roundness, surface finish, contour...
- On completion the carousel moves to the next angular position and the process starts again

Unparalleled measurement capability

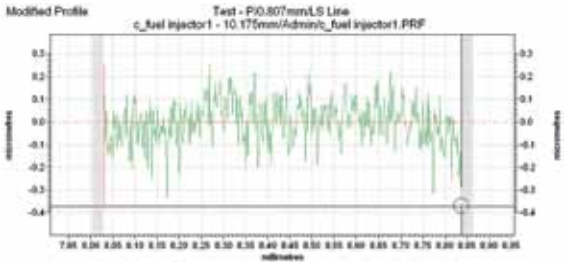
Five measurements in one

Our world leading Talymin 6 gauge with 4 mm range and any attitude orientation has capability beyond that of normal roundness systems

1

Roughness

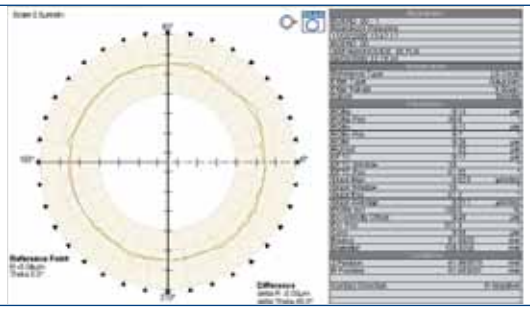
High resolution gauge and low axis noise enables linear or circumferential surface roughness measurement.



2

Roundness

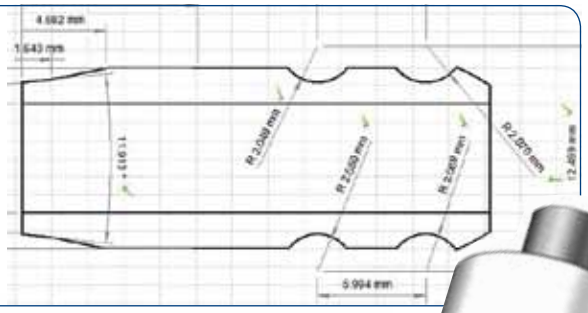
Frictionless air bearing spindle and precision column for roundness, cylindricity and straightness measurements.



3

Contour

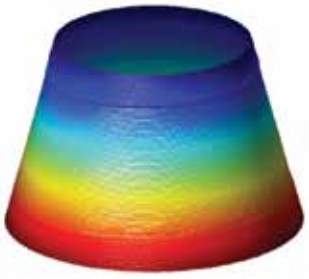
Our patented calibration technique enables measurement of radius, angle, height, length, distance and more.



4

Cylindrical mapping

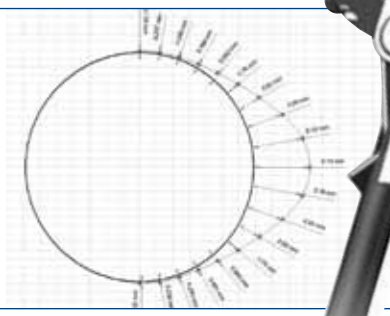
Precision control and low noise in all axes allows in depth analysis of cylindrical components including wear scars and material volume.



5

Cams and pistons

A precision encoder and linear scales in all axes enables measurement of non round parts such as cams and pistons.



Designed to suit your application

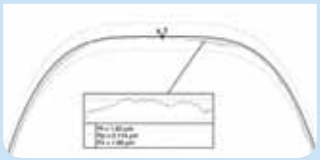
Meeting the ever increasing demands of next generation technologies

Taylor Hobson have had a long association with advanced manufacturing, this association has helped to evolve powerful software solutions to suit your applications

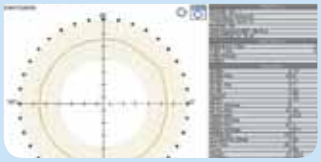
Bearings

Harmonic analysis

Tilt and form error to axis



Roundness



Medical applications

Roundness

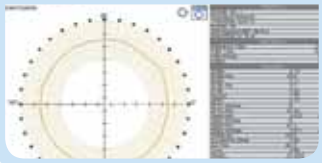
Form & radius analysis

Fuel injectors

Angle and distance

Surface finish

Roundness



Camera phone lens holders

Parallelism

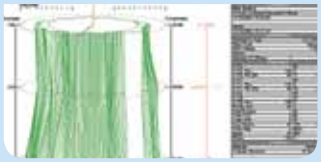
Roundness

Lens moulds

Surface finish

Parallelism

Cylindricity

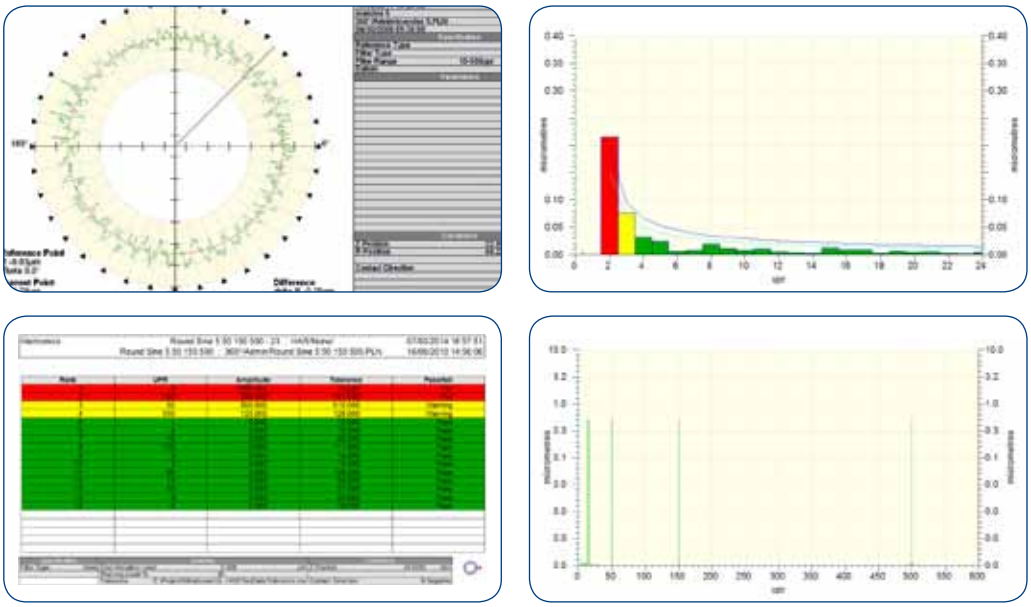


Powerful software tools help improve your process

Advanced harmonics – identify the cause of bad parts

Ordinary inspection might detect bad components but Talyrond® 500HS can help you fix the production issues that are causing them. Deviation in form on a workpiece can be broken down into irregularities that have both frequency and amplitude. Harmonic analysis identifies these imperfections allowing you to pinpoint and correct their cause, reducing the need for ever tighter tolerances on size.

- Full histogram view with tolerance bands
- Pass/Fail and warning messages
- Ranking system according to wave depth or harmonic amplitude
- Comparison to CSV or GKD files
- Up to 5000 upr
- Wave depth or harmonic amplitude format

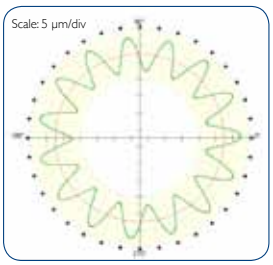


New Advanced Harmonic Standard

A precision machined standard with the following undulations in 360 degrees:

15	upr
50	upr
150	upr
500	upr
1500	upr

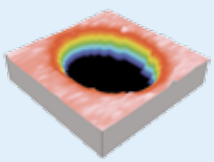
"Giving confidence in your instrument"



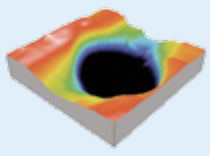
Example of 15th harmonic

3D cylindrical mapping

For production issues beyond the scope of traditional 2D inspection techniques



Crankshaft oil hole without washout



Crankshaft oil hole with washout

With high accuracy and high resolution in all axes, Talyrond® 500HS allows you to measure in 3 dimensions for more thorough examination of flaws, defects and cutting tool geometry effects that influence performance or lead to component malfunction.

- Twist or lead detection
- Wear scar analysis
- Machining defects
- Leak detection and more

Q-Link is part of Taylor Hobson's ongoing developments supporting automation, data exchange and process control in manufacturing environments. This approach is in line with the Industry 4 philosophy.

INDUSTRY 4.0
IN ACTION

Q-Link Production Interface

A simplified interface designed specifically for production environments

Q-Link offers simplicity, versatility and traceability and provides direct communication with SPC software which delivers feedback to your manufacturing process.

QDAS accredited
Meets the demands of the Advanced Quality Data Exchange Format

Protection
Allows different user levels and configurations

Reporting
Instant screen report summary with pass/fail results

Traceability
Configurable fields; serial number, operator name, machine number etc...

Implementation
Easy to learn, simple to operate

Statistical studies
Automatic R&R Studies available as standard

Tolerancing
Visually identifies the parameter and its tolerance band

Compatibility
Across the range of roundness and surface finish products

"Widely used in automotive and aerospace component manufacturing where data and strict standard operating procedure control is mandatory"

Designed for metrology without compromise

The construction of the Talyrond® 500HS is key to measurement integrity

Reproducing the part

Taylor Hobson's core competencies are in cylindrical grinding, surface grinding and diamond turning. All of these disciplines coupled with knowledge in drive mechanisms go towards constructing an instrument with low noise and high geometric accuracy, ensuring reproducibility of the component.

Frictionless air bearing spindle

The instrument's spindle axis, like any spindle based machine tool, is paramount in ensuring integrity of measurement. Utilising Taylor Hobson's own diamond turning lathe we are able to create a reference datum unsurpassed in accuracy and reliability.

Instrument base

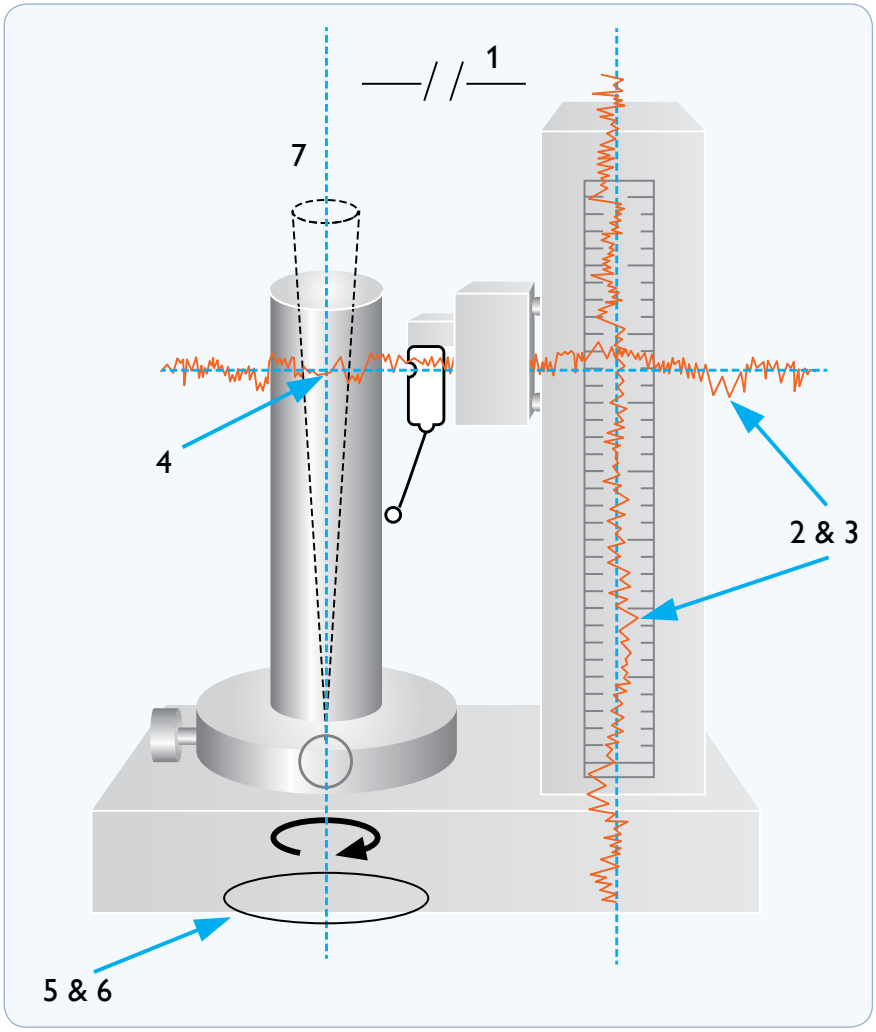
Using finite element analysis software, the cast iron base provides a solid foundation for both the high precision air bearing spindle and vertical straightness datum, ensuring movement and weight do not effect results. A choice of passive or active isolation mounts are available, which have been designed for either inspection laboratories or production environments.

Straightness datums

The vertical column is machined for straightness, waviness and roughness to an exacting standard, using traceable standards and techniques developed by Taylor Hobson. The straightness datums are further enhanced to ensure reproducibility of the part with little or no instrument influence.

Industry specific software

Velocity analysis allows bearing manufacturers to evaluate harmonics with respect to amplitude and predict function with respect to speed



Important features of a roundness system

1	Parallelism of column to spindle axis
2	Column and arm straightness
3	Low vertical and radial arm noise
4	Squareness of arm to spindle axis
5	Radial run-out of spindle
6	Low spindle noise
7	Minimised coning error of spindle
8	Accurate glass scales in all axes

"World-beating noise floor"

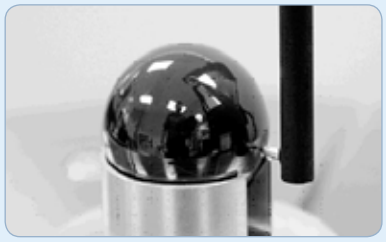
Traceability

Full traceability to international standards

Roundness

Using a precision polished glass hemisphere calibrated to an uncertainty of less than 5 nm Taylor Hobson can guarantee your spindle is within specification and maintain quality of results.

Arcuate correction (contour option)



Taylor Hobson's patented calibration routine and calibration ball corrects for the arcuate motion of the stylus allowing dimensional measurement. This routine is critical to measurement of radius and angled parts when normal calibration routines will not suffice.

Axis calibration

Automated or manual routines are supplied allowing the user to set coordinates to the part or instrument axes. The fully automated routine calibrates the arm, column and spindle.

Straightness, squareness and parallelism

To ensure the column and radial straightness unit conform to specification we can provide standards that are either cylindrical or flat. These standards provide certainty of the measurement axes. These artefacts are combined with special software routines to enhance all axes for correct geometrical form.

Traceability

All calibration standards can be provided with traceability to international standards using Taylor Hobson's own UKAS laboratory.

Automated probe calibration

The Talyrond® 500HS has a unique automated gain calibration for the instrument's gauge; the routine is automated and takes a matter of seconds to set. Alternatively a set of calibrated slip blocks traceable to primary standards are also supplied.

Surface finish

A unique standard is available that provides measurement traceability for roughness in both a vertical and circumferential direction.

Accessories

All the accessories you need to begin using Taylor Hobson roundness measuring systems are supplied as standard. However, for more demanding requirements or improved measurement throughput, we have a range of accessories which may be ordered separately.

❶ Environmental cabinet and active AV mounts

Recommended for use in production or non controlled environments.

Environmental cabinet

The environmental cabinet forms part of the instrument structure and protects against airflow, dust and external influence.

code 112-4276

Active anti-vibration mounts

The active AV mounts protect the system from external vibration by use of piezo actuated mounts.

code 112-4277

Active AV mounts with environmental cabinet

Provides isolation from airflow, dust and external vibration

code 112-4278

❷ Talyrond® ball calibration standard

Required for use with contour or form software, this calibration standard corrects for gain, tip and arcuate motion of the stylus.

Talyrond® ball standard rad 7.5 mm (Not recommended for 4 mm range)
code 112-4305UC

Talyrond® ball standard rad 12.5 mm (Not recommended for 4 mm range)
code 112-4319UC

Talyrond® ball standard rad 22.5 mm
code 112-4092UC

❸ Flick standard

For rapid calibration of the gauge head; alternative to the standard gauge calibration set.

20 µm (788 µ") range
code 112-2308 optional

300 µm (0.012") range
code 112-2233 optional

❹ Calibration standard

Vertical and circumferential roughness.

code 112-4341

❺ High precision glass hemisphere

For checking total system performance; UKAS calibration certificate is optional.

Roundness < 0.02 µm (0.8 µ")

code 112-2324 optional

Glass hemisphere

For checking total system performance; UKAS calibration certificate is optional.

Roundness < 0.05 µm (2 µ")

code 112-436 optional

❻ High precision test cylinder

For verification of the instrument's vertical straightness accuracy and parallelism of the vertical axis to the spindle axis. UKAS calibration certificate is optional.

code 112-3670-01 optional

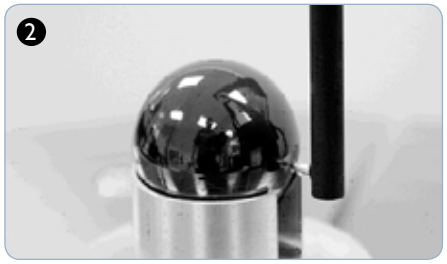
Precision test cylinder

For verification of the instrument's vertical straightness accuracy and parallelism of the vertical axis to the spindle axis. UKAS calibration certificate is optional.

300 mm (11.8") cylinder
Roundness < 0.25 µm (10 µ")
Straightness < 0.5 µm (20 µ")*
code 112-1888 optional

500 mm (19.7") cylinder
Roundness < 0.25 µm (10 µ")
Straightness < 0.5 µm (20 µ")*
code 112-1997 optional

1000 mm (39.4") cylinder
Roundness < 0.75 µm (30 µ")
Straightness < 3 µm (120 µ")*
code 112-3604 optional



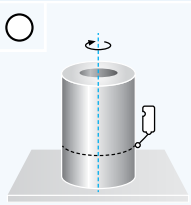
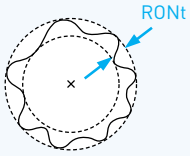
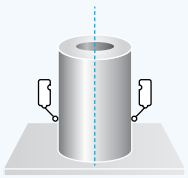
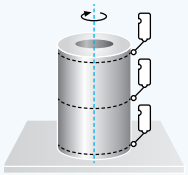
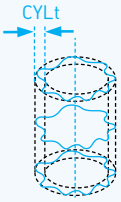
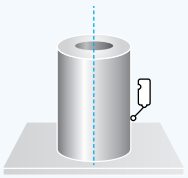
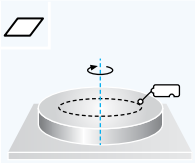
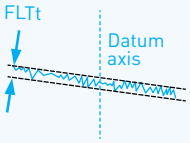
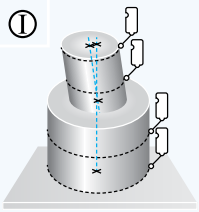
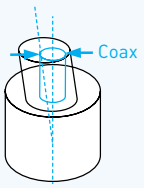
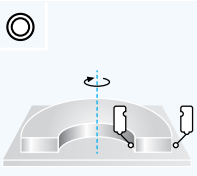
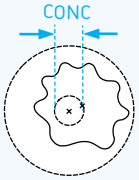
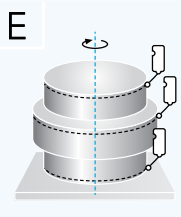
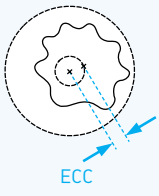
Customised solutions for special applications

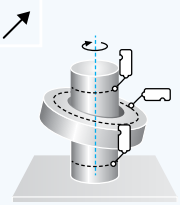
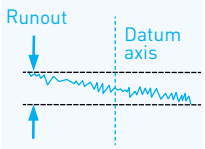
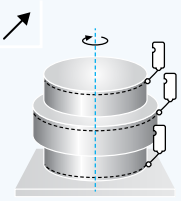
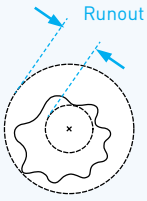
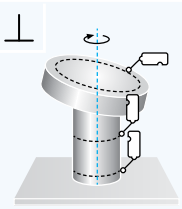
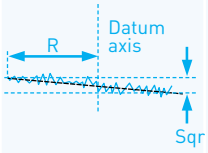
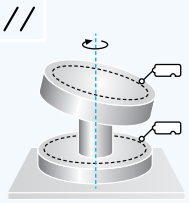
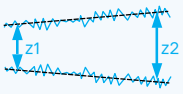
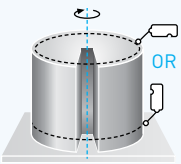
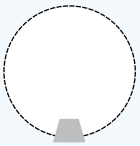
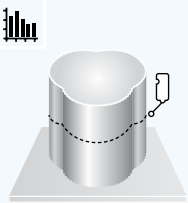
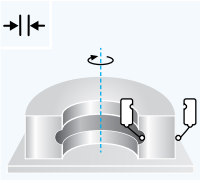
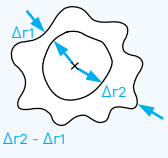
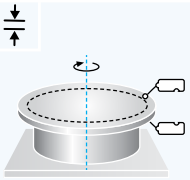
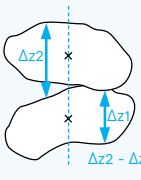
Our strategy for success is simple, instead of just selling products, we provide solutions. If our standard instruments and accessories do not satisfy your needs, we can customise a solution to exactly match your application.

* Straightness over central 90% of test cylinder length

Specifications are subject to change without notice.

Parameters

Type of analysis	Measurement mode	Evaluation diagram	Talyrond® 500HS
Roundness			✓
Parallelism			✓
Cylindricity			✓
Straightness			✓
Flatness			✓
Coaxiality			✓
Concentricity			✓
Eccentricity			✓

Type of analysis		Measurement mode	Evaluation diagram	Talyrond® 500HS
Radial Runout	Axial			✓
	Radial			✓
Squareness				✓
Parallelism				✓
Measure Interrupted Surface				✓
Harmonic Analysis				●
Thickness Variation	Radial			●
	Axial			●

✓ = Included ● = Optional ✗ = Not available
(Customer specific analysis available on request)

TAYLOR HOBSON®

AMETEK®
ULTRA PRECISION TECHNOLOGIES

The metrology experts

Taylor Hobson is world renowned as a manufacturer of precision measuring instruments used for inspection in research and production facilities. Our equipment performs at nanometric levels of resolution and accuracy.

To complement our precision manufacturing capability we also offer a host of metrology support services to provide our customers with complete solutions to their measuring needs and total confidence in their results.

www.taylor-hobson.com

Centre of Excellence department

Email: **taylor-hobson.cofe@ametek.com**
Tel: **+44 (0)116 276 3779**

- **Inspection services** – measurement of your production parts by skilled technicians using industry leading instruments in accord with ISO standards
- **Metrology training** – practical, hands-on training courses for roundness and surface finish conducted by experienced metrologists
- **Operator training** – on-site instruction will lead to greater proficiency and higher productivity
- **UKAS calibration and testing** – certification for artifacts or instruments in our laboratory or at customer's site

Sales department

Email: **taylor-hobson.sales@ametek.com**
Tel: **+44 (0)116 246 2034**

- **Design engineering** – special purpose, dedicated metrology systems for demanding applications
- **Precision manufacturing** – contract machining services for high precision applications and industries

Service department

Email: **taylor-hobson.service@ametek.com**
Tel: **+44 (0)116 246 2900**

- **Preventative maintenance** – protect your metrology investment with an Amecare support agreement

ilac-MRA UKAS CALIBRATION 0026 UKAS TESTING 2624

Talyrond® 565/585 HS_09/2016

Taylor Hobson UK
(Global Headquarters)
PO Box 36, 2 New Star Road
Leicester, LE4 9JD, England
Tel: +44 (0)116 276 3771
Fax: +44 (0)116 246 0579
taylor-hobson.sales@ametek.com

Taylor Hobson China
taylor-hobson-china.sales@ametek.com.cn

Shanghai Office
Part A1, A4. 2nd Floor, Building No. 1, No. 526 Fute 3rd Road East, Pilot Free Trade Zone, Shanghai, 200131, China
Tel: +86 21 5868 5111-110
Fax: +86 21 5866 0969-110

Beijing Office
Western Section, 2nd Floor, Jing Dong Fang Building (B10), No. 10, Jiu Xian Qiao Road, Chaoyang District, Beijing, 100015, China
Tel: +86 10 8526 2111
Fax: +86 10 8526 2141

Chengdu Office
Unit 9-10,10th Floor9/F, Hi-tech Incubation Park, No.26 West Jinyue Road, Chengdu. 610041, China
Tel: +86 28 8675 8111
Fax: +86 28 8675 8141

Guangzhou Office
Room 1412,Yi An square, No.33 Six Construction Road, Guangzhou, 510060, China
Tel: +86 20 8363 4768
Fax: +86 20 8363 3701

Taylor Hobson France
Rond Point de l'Epine Champs
Batiment D, 78990 Elancourt, France
Tel: +33 130 68 89 30
Fax: +33 130 68 89 39
taylor-hobson.france@ametek.com

Taylor Hobson Germany
Rudolf-Diesel-Straße 16
D-64331 Weiterstadt, Germany
Tel: +49 6150 543 0
Fax: +49 6150 543 1502
taylor-hobson.germany@ametek.com

Taylor Hobson India
1st Floor, Prestige Featherlite Tech Park 148, EPIP II Phase, Whitefield, Bangalore - 560 006, India
Tel: +91 18 6026 62468
Fax: +91 80 6782 3232
taylor-hobson.india@ametek.com

Taylor Hobson Italy
Via De Barzi, 20087 Robecco sul Naviglio, Milan, Italy
Tel: +39 02 946 93401
Fax: +39 02 946 93450
taylor-hobson.italy@ametek.com

Taylor Hobson Japan
3F Shiba NBF Tower, 1-1-30, Shiba Daimon Minato-ku, Tokyo 105-0012, Japan
Tel: +81 36809 2406
Fax: +81 36809 2410
taylor-hobson.japan@ametek.com

Taylor Hobson Korea
#309, 3rd FL, Gyeonggi R&DB Center, 105, Gwanggyo-ro,Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea, 16229
Tel: +82 31 888 5255
Fax: +82 31 888 5228
taylor-hobson.korea@ametek.com

Taylor Hobson Mexico
Acceso III No. 16 Nave 3 Parque Ind. Benito Juarez Queretaro, Qro. Mexico C.P. 76120, Mexico
Tel: +52 442 426 4480
Fax: +52 442 295 1987
taylor-hobson.mexico@ametek.com

Taylor Hobson Singapore
AMETEK singapore, 10 Ang Mo Kio Street 65, No. 05-12 Techpoint, Singapore 569059
Tel: +65 6484 2388 Ext 120
Fax: +65 6484 2388 Ext 120
taylor-hobson.singapore@ametek.com

Taylor Hobson Taiwan
10F-5, No.120, Sec. 2, Gongdao Wu Rd., Hsinchu City 30072, Taiwan
Tel: +886 3 575 0099 Ext 301
Fax: +886 3 575 0799
taylor-hobson.taiwan@ametek.com

Taylor Hobson USA
1725 Western Drive, West Chicago, Illinois 60185, USA
Tel: +1 630 621 3099
Fax: +1 630 231 1739
taylor-hobson.usa@ametek.com