Form Talysurf®
i-Series

A high resolution instrument range offering automated surface and contour inspection

Ideal for automotive, gears and many other applications
The Form Talysurf® i-Series

A high range high resolution system for contour and surface finish measurement

Ideally suited for automotive, gears and many other applications

Surface and Contour in One

The Form Talysurf® i-Series is a high accuracy instrument range capable of simultaneous surface finish and contour measurement. The system’s low noise axes and high resolution gauge ensures measurement integrity with choice of gauge ranges providing versatility for a variety of applications.

Reproducible measurement results

Decades of experience, ultra precision machining expertise and FEA optimized design combine to provide low noise and near flawless mechanical execution of the measuring axes. Further enhancement via the use of traceable standards and exclusive algorithms effectively eliminates instrument influence from the measurement results.

125

Gauge

Gauge Range
Up to 5 mm

Resolution
Down to 0.4 nm

✓

Roughness

Noise
Less than 6 nm Rq

Contour

LS Arc Measurement
Less than 3.3 µm

Pt
Less than 0.25 µm

Temperature

Temperature compensation ensures consistent system performance
Unparalleled measurement capability

Taylor Hobson is the only company that can prove measurement capability over the full gauge range.

Taylor Hobson quote world leading specification capabilities over the full gauge range. Other manufacturers quote less radius accuracy and form capability over a significantly reduced gauge range, indicating less confidence in their measurement results.

Save time and money - one measurement multiple results

Key measurements for design and production

Surface analysis
- Form
- Radius
- Roughness
- Waviness
- Dominant wavelength

Contour analysis
- Radius
- Angle
- Height
- Length
- Distance and more

3D
Using an optional motorized Y-stage and Talymap, transform your conventional 2D measurement into a 3D analysis tool.
Complete trust in your metrology platform
The world leading gauge supported by the world leading noise floor

Taylor Hobson take great pride in our measurement integrity and reproducibility. Fundamental to any metrology system is its noise floor capability. Measurement accuracy and repeatability performance is directly related to a stable platform and therefore Taylor Hobson take great pride in boasting the world’s best noise floor.

Our products are underpinned by decades of measurement experience, ultra-precision manufacturing expertise and FEA optimized design. These provide low noise and near flawless mechanical execution of the measuring axes.

“World leading system noise floor - less than 6 nm Rq, less than 20 nm Rz”

Composite granite construction
Both the column and the base are made of this unique material to provide high vibration dampening, thermal inertia and stiffness throughout the event cycle.

Large base
This stable base isolates the instrument from vibration and offers plenty of room for staging large components. Two tee slots, parallel to each other within 0.3 mm (0.01 in), are provided for precise mounting of accessories.

Anti-Vibration system
Passive air mounts fitted to all systems work in conjunction with the steel support frame to reduce measurement noise in shop floor environments.

Steel support frame
Welded steel frame for rigid support of granite instrument base and motorized column; includes heavy duty leveling mechanism on all four legs.

Environmental enclosure
Clear polycarbonate panels set in a rigid aluminium frame completely surround the measuring station to suppress contamination, air currents and temperature fluctuations.
Tailored to suit your application

From crankshafts or engine blocks to valve guides select the configuration that suits your requirements...

Temperature compensation

Standard across all Form Talysurf® i-Series models, this unique system monitors and feeds back changes in ambient temperature, ensuring consistent system performance and high measurement integrity, regardless of environmental effects.
Applications

Cylinder heads
- Valve surface finish
- Valve angle

Gears
- Surface finish
- Root radius and form deviation

Crankshafts
- Surface finish
- Fillet radi and DXF comparison

Sheet metal
- Surface finish
- Waviness - Wsa and Wst parameters

Medical
- Surface finish
- Wear analysis
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.

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.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>QDAS accredited</td>
<td>Meets the demands of the Advanced Quality Data Exchange Format</td>
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<tr>
<td>Reporting</td>
<td>Instant screen report summary with pass/fail results</td>
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<tr>
<td>Implementation</td>
<td>Easy to learn, simple to operate</td>
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<tr>
<td>Tolerancing</td>
<td>Visually identifies the parameter and its tolerance band</td>
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<td>Protection</td>
<td>Allows different user levels and configurations</td>
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<td>Traceability</td>
<td>Configurable fields; serial number, operator name, machine number etc...</td>
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<tr>
<td>Statistical studies</td>
<td>Automatic R&amp;R Studies available as standard</td>
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<tr>
<td>Compatibility</td>
<td>Across the range of roundness and surface finish products</td>
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“ Widely used in automotive and aerospace component manufacturing where data and strict standard operating procedure control is mandatory. ”
Ultra surface finish parameters
Powerful software for the analysis of surface finish and form

Form removal and analysis functions

Form error
Deviation from nominal form is calculated with reference to a best fit straight line, best fit circular arc or best fit conic section.
Form deviation may also be calculated with reference to a minimum zone straight line (the minimum separation between two parallel lines containing the data set).

Radius
Using a least squares best fit, the radius of concave or convex circular arcs can be automatically calculated from selected data. An option to exclude any unwanted features such as edges is also available.
Alternatively, the absolute radius can be set to analyse the actual deviation from a design master. Other calculated parameters include the centre coordinate.

Angle (slope)
Surface tilt can be determined and removed prior to parameter analysis by means of a straight line or minimum zone algorithm. Other calculated values include intercept and pitch.

Dimension
The linear relationship of surface features can be assessed and compared by means of calculated X & Z coordinate positions.
- Datum slope
- Delta slope
- Pitch (between centres)
- Intercept X / Intercept Z

Dual profile
This analysis function enables comparison of one measured profile to another or even to a master profile which has been saved as a template. A 'difference' profile can be displayed at the touch of a button and used for further analyses.

Surface finish parameters

Primary parameters
DFTF, LSLP Ave, LSLP Max, Pa, Pc, PCf, PCI, PCR, Pda*, Pdc*, Pdq*, PHSC*, Pku, Plin, PLo, Plq, Pmr*, Pmr(C)*, Pp, Ppc*, Pq, Ps, Psk, PSm, Pt, Pv, PVo*, Pz, Pz(JIS)

Roughness parameters
R3y, R3z, Ra, Rc, Rcf, RCi, RCr, Rd*, Rdc*, Rdq*, RHSC*, Rku, Rln, RLc, Rpq, Rp* , Rp1max, Rpc*, Rq, Rs, Rsk, RSm, Rt, Rv, Rv1max, RVo*, Rz, Rz(DIN), Rz(JIS), Rz(n)*, Rz1max

Waviness parameters

Rk parameters and Rk curve
A1, A2, APH, AVH, CV, Mr1, Mr2, Rk, Rp1, Rvk, Rvk/Rk

R & W parameters
AR, AW, Pt, R, Rke, Rn, Rpke, RVke, Rx, Sar, Saw, Sr, Sw, W, Wn, Wte, Wx

Dominant wavelength
WD1c, WD1Sm, WD1t, WD2c, WD2Sm, WD2t, WD5Max, WDSmMin

Filters and additional features

Filters
Gaussian, Robust Gaussian, Gaussian VDA, Morphological, ISO 2CR, 2CR PC, Rk, Spline

Cut-off (Lc)
0.08, 0.25, 0.8, 2.5, 8mm, 25mm and operator input

Bandwidth
10:1, 30:1, 100:1, 300:1 and 1000:1 or as defined by data spacing(VDA2006)

Note
Where applicable the parameters conform to and are named as per the standards:
- ISO4287:1997
- ISO13565-2:1996
- ISO12085:1996

* All parameters marked with an asterix require user assigned single or multiple qualifiers. For example, material ratio may be assessed at one or more slice levels within a single measurement.

Dual Profile analysis allows two sets of measurement data to be displayed at once and is ideal for testing system noise and repeatability.
Key features in TalyMap® Contour

Powerful software for the analysis of length, radius, angle and more...

Desktop publishing
Quick & instant report generation

Ease of use
Contour software is easy to use and requires minimal training. Intuitive icon based tools allow the user to define and modify elements and dimensions with the click of a button.

Automation
Reports and analysis routines can be saved as single templates and re-applied to component batches.
Special software routines allow full automation regardless of part variation or positional set up ensuring repeatable results.

Comparison with CAD models
Load DXF models and automatically fit to the measured profile, results will display deviations, tolerance limits and deviation parameters.

Full dimensional analysis
Linear, Angular, Radial and more

Q-Link Compatible
Take advantage of automatic reporting and exporting in Q-Das or text format

Further analyses
Gothic arch profile analysis as standard
Full traceability to international standards
Critical results, trust Taylor Hobson

Datum straightness.
To ensure the traverse unit conforms to specifications Taylor Hobson can supply Zerodur straightness standards.
These standards provide certainty in the traverse direction and are combined with special software routines to enhance the measuring axis for correct geometrical form.

Surface finish.
Taylor Hobson can provide glass or metal roughness standards calibrated to an uncertainty of ±(2% + 4 nm) providing measurement confidence and compliance for peak parameters with respect to ISO standards.
Spacing standards are also available to an uncertainty of ±0.6 µm.

Grating correction.
All our traverse units are tested and enhanced using interferometric techniques ensuring accurate dimensional and surface texture measurement in the x direction.

Step height.
To ensure the correct gain setting of your instrument, high precision step height standards are available; calibrated with uncertainties down to ±4 nm.

Traceability.
Taylor Hobson provides full certification for artefacts and instruments in our purpose built ISO graded clean room UKAS facility.
Our UKAS laboratory is able to measure all of the parameters associated with surface texture, including French, German, USA and Japanese derivatives.

Arcuate correction.
The Form TalySurf® systems use a patented ball calibration routine to ensure that both dimensional measurement capability and gauge linearity are dealt with in a single, automated operation.
This fast and simple process uses high-precision spherical calibration artefacts that have been produced to exacting standards and then calibrated for radius and form traceable to international standards.

For further information please visit our website or contact our worldwide Centre of Excellence.

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Unique patented ball calibration routine
Artefacts from Taylor Hobson's UKAS approved laboratory are used throughout the process

The benefit
The Form Talysurf® i-Series systems use a patented ball calibration routine to ensure that the dimensional measurement capability and gauge linearity are dealt with in a single, automated operation. This routine uses high-precision spherical calibration artefacts that have been produced to exacting standards and then calibrated for radius, form and surface finish in our own UKAS approved laboratory.

The process
In operation the user simply completes a dialog confirming parameters such as the percentage of gauge range to be used and the traverse speed. Working from knowledge of the stylus geometry and the dimensions of the calibration standard, the software automatically calculates the measurement properties and drives the traverse unit and column appropriately, completing the calibration with the minimum of operator intervention.

“When the results really matter, people trust Taylor Hobson.”

A damaged Space Station trundle bearing assembly measured on a Form Talysurf® system
Established in 1886, Taylor Hobson is the world leader in surface and form metrology and developed the first roundness and surface finish measuring instruments.

www.taylor-hobson.com

- 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.

Preventative maintenance – protect your metrology investment with an AMECare support agreement.

Design engineering – special purpose, dedicated metrology systems for demanding applications.

Precision manufacturing – contract machining services for high precision applications and industries.

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