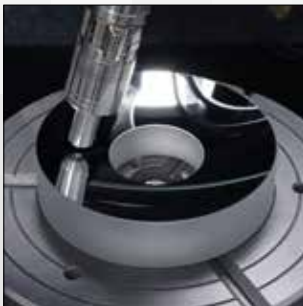
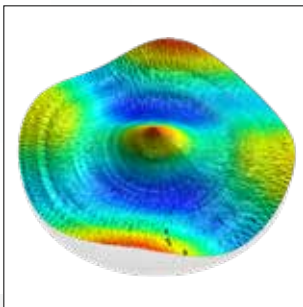


LUPHOSCAN 260/420

Ultra-precision, fast, non-contact 3D form
measurements of aspheric surfaces



LUPHOSCAN

Ultra-precision non-contact 3D form measurement **Aspheric lenses, spheres, flats and freeforms**

World-leading optics metrology

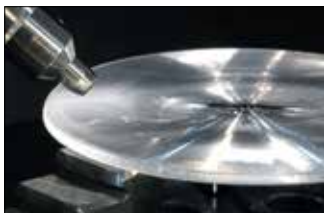
The LUPHOScan is designed to perform ultra precision non-contact 3D form measurements of both rotationally symmetric and non-rotationally symmetric surfaces such as aspheric lenses, spheres, flats and freeforms.

Key benefits of the system include fast measurement speeds, high flexibility with regard to uncommon surface shapes (e.g. flat apexes or profiles with points of inflection) and maximum object diameters up to 420 mm.

Cutting-edge technology

The LUPHOScan is an interferometric, scanning metrology system based on MWLI® technology (multi-wavelength interferometry).

The MWLI® sensor technology enables a large variety of different surface types such as transparent materials, metal parts, and some ground surfaces to be analysed.



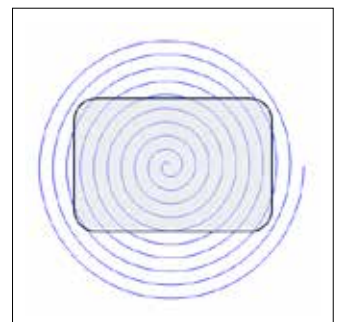
A truly flexible system

Measurement of non-rotational shapes

The unique MWLI® approach enables parts of any geometric or unique shape to be measured. The MWLI® only collects measurement data when it's in-focus, out of focus data is disregarded. Allowing non-circular parts to be measured in one continuous measurement without the need for stitching data.

LUPHOSoft - Powerful software

Intuitive software delivers easy measurement and analysis of complex optical surfaces. The 'Alignment Wizard' provides guidance and support for quick and repeatable part set-up. LUPHOSoft is compatible with all leading surface design formats, including true freeform surfaces. The measurement data can be output to support toolpath correction for all machine types.



Continuous measurement
irrelevant of surface shape

Reproducibility

Ultra high accuracy
 $\leq \pm 50 \text{ nm } (3\sigma)$
(PV99i)

Diameters

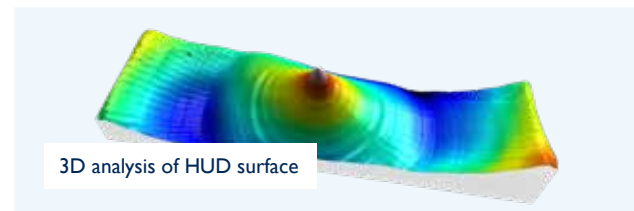
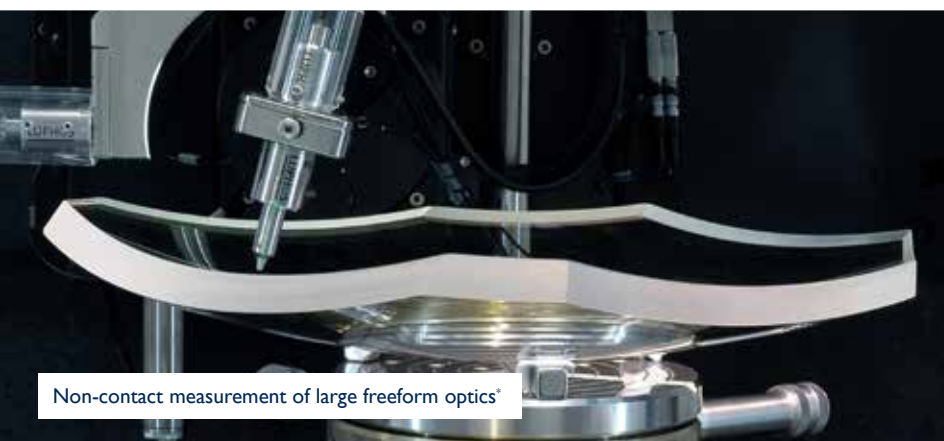
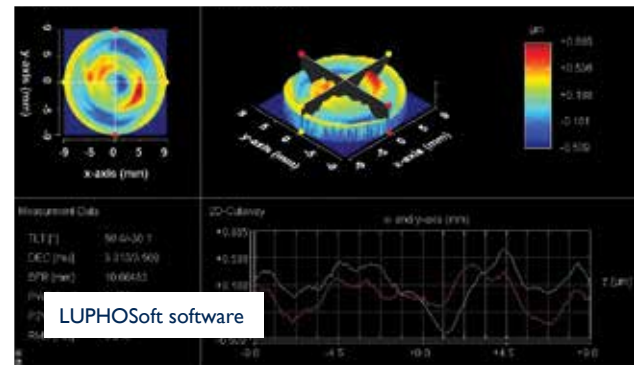
Up to
420 mm

Steep slopes

Up to
 90°

Noise

Very low noise
 $\leq \pm 5 \text{ nm } (3\sigma)$
(RMS)



Unique benefits for both design and production

Setting the standard for precision optics measurement

- **Analyse any rotationally symmetric surface**
Aspheres, spheres, flats and freeforms
- **Measurement flexibility**
Segmented surfaces, annular optics, rectangular surfaces, surfaces with diffractive structures, axicons
- **Complete lens characterisation**
- LUPHOSWAP or TTL (Through the Lens)**
Lens thickness, wedge error, decentre error, lens-mount positioning
- **Large spherical departures**
Measure pancake or gullwing surfaces and profiles with points of inflection
- **Highest accuracy - up to 90° of object slopes**
Ideal for measuring strong, steep, and small aspheres
- **Almost every material**
Transparent, specular, opaque, polished and some ground surfaces
- **Best shot-to-shot stability available**
Power variation $< \pm 20 \text{ nm } (3\sigma)$,
PV variation $< \pm 5 \text{ nm } (3\sigma)$
- **Fast measurement speeds**
1:45 min ($\varnothing = 30 \text{ mm}$, Roc = 60 mm, 100 points / mm^2)
3:45 min ($\varnothing = 130 \text{ mm}$, Roc = 150 mm, 50 points / mm^2)

LUPHOSCAN

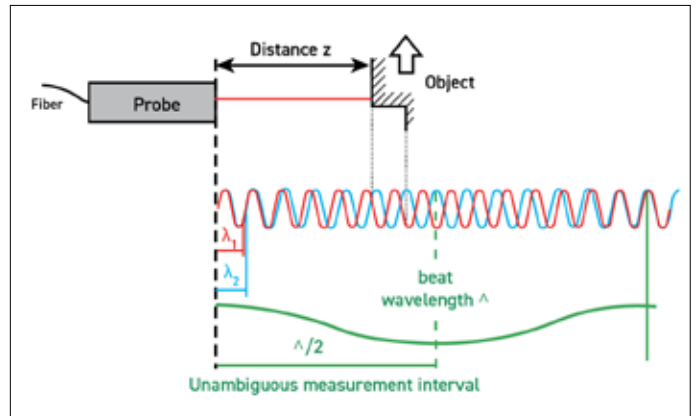
Multi-Wavelength Interferometry (MWLI®)

Highest precision paired with absolute measurement capability

The LUPHOScan is based on the MWLI® technology for precision distance measurement.

Up to four wavelengths are used to acquire a robust and absolute measurement result. All signals are evaluated simultaneously to enhance robustness.

A synthetic beat-wavelength is calculated to massively extend the absolute measurement capability.

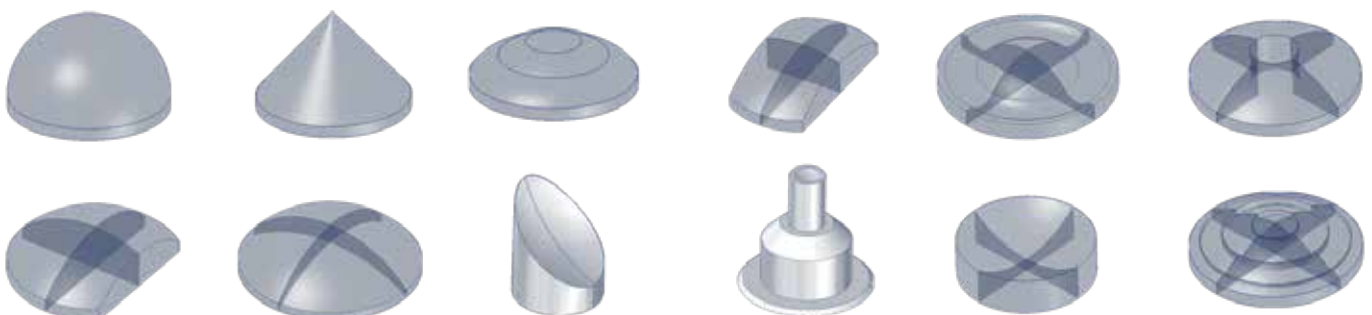


Our multi-wavelength approach enables the calculation of a synthetic beat wavelength – enabling an absolute measurement range of up to 1.25 mm

- Absolute measurement capability is extended by a factor of more than 4000 compared to a standard interferometer, enabling the measurement of interrupted and segmented surfaces.
- Fiber based Fizeau setup guarantees for maximum flexibility in scanning metrology configuration with minimum environmental influence.

LUPHOScan flexibility

Measure freeforms, gullwing surfaces, segmented surfaces, annular optics, rectangular surfaces, surfaces with diffractive structures and axicons...



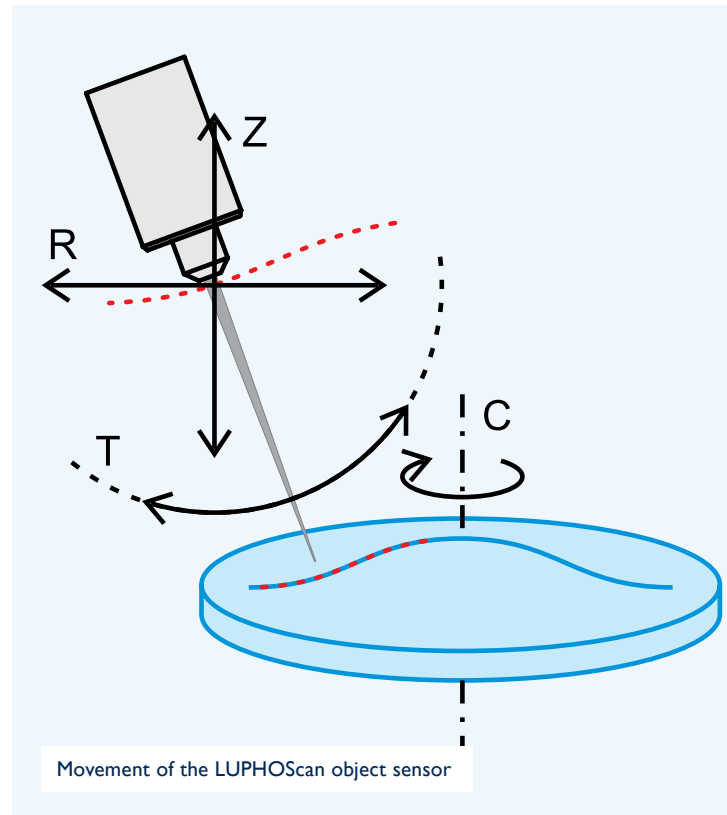
Measurement principle

Scanning metrology for highest flexibility

For the measurement, a full surface scan is performed by means of an MWLI® point sensor and four precision stages.

While the sensor is continuously moved – equidistant and normal to the design – by two linear stages (R, Z) and one rotary stage (T), the object under test rotates by means of a precision air-bearing spindle (C).

Like this, a spiral trajectory is performed, enabling a high-resolution and fast direct target-actual comparison. To achieve highest accuracy results, the movement is fully referenced by three additional sensors. All first-order errors are immediately compensated by the referencing principle, higher order errors are eliminated by smart calibrations.



Designed and manufactured to the highest standards

Both LUPHOScan SD and HD configurations benefit from key flexibility and functionality. Full part measurement capability is available on both configurations (table, right).

LUPHOScan SD

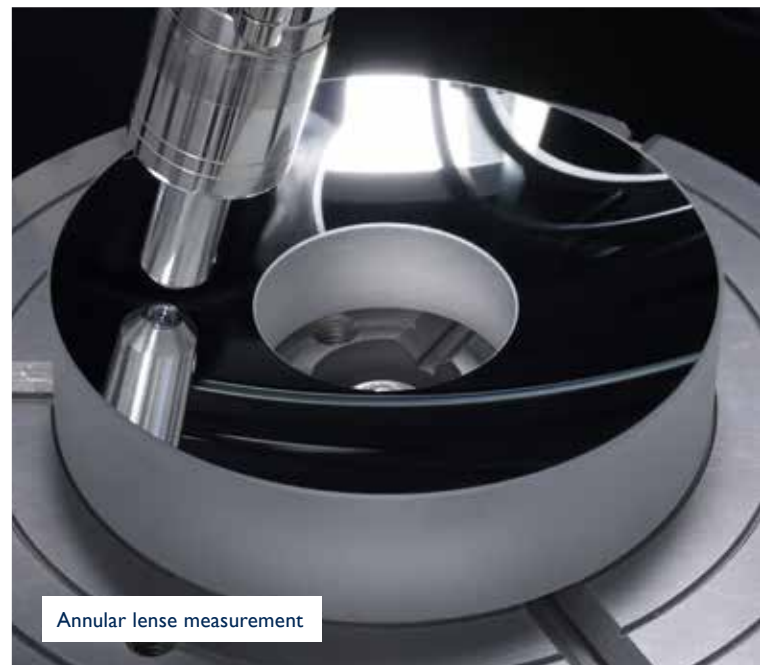
The SD platform is ideal for...

- Good, stable environments
- Lower slope angles on parts
- Situations where short term stability is acceptable (i.e. measurement of small batches of parts)

LUPHOScan HD

The HD platform is ideal for...

- Less stable environments where temperature compensation and active vibration are required
- Optics with steep slopes or extreme aspheres (gullwings, etc.)
- Long term stability (i.e. high volume production batches)



	SD	HD
AV System	Passive Pneumatic	Piezo Active
Thermal compensation	No	Yes
Vertical Mirror Correction	Service Only	Operator Level

Sales

Email: taylor-hobson.sales@ametech.com

Tel: +44 (0) 116 276 3771

- **Design Engineering** – Special purpose and dedicated metrology systems for demanding applications.
- **Precision Manufacturing** – Contract machining services for high precision applications and industries.

Service

Email: taylor-hobson.service@ametech.com

Tel: +44 (0) 116 246 2900

- **Preventative Maintenance** – Protect your metrology investment with an AMECare support agreement.
- **Upgrades** – Carried out by Taylor Hobson accredited service engineers and include installation and calibration to ensure your system runs at peak performance.

Metrology Support

Email: taylor-hobson.cofe@ametech.com

Tel: +44 (0) 116 276 3779

- **Contract Measurement** – A cost effective option to capital expenditure, simply send in first article or production components for measurement.

Measurement of your parts is carried out 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 & Testing** – Certification for artifacts or instruments in our laboratory or at customer's site.



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