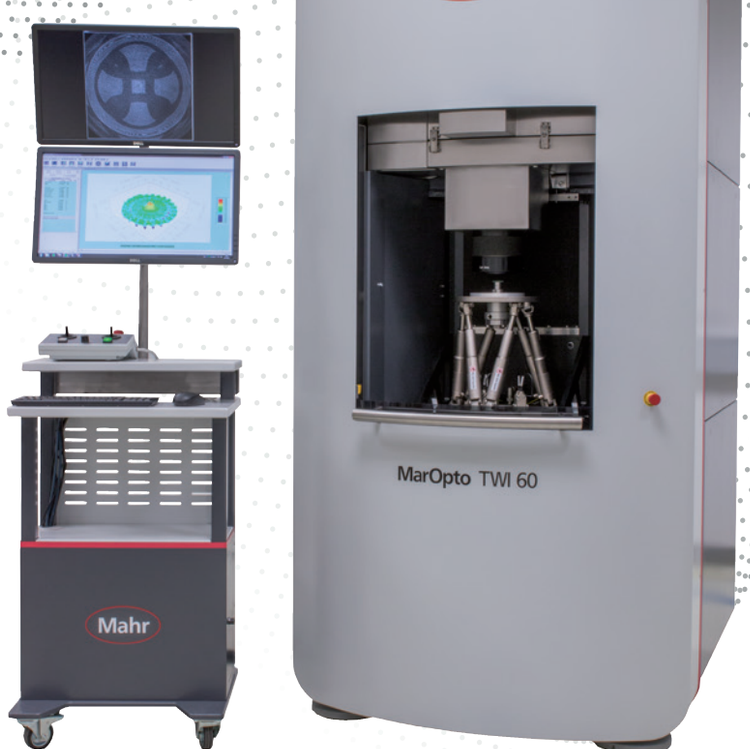
MarOpto | Measuring Instruments for the Optical Industry

The role of metrology is changing to keep up with innovations in manufacturing processes. Given the ever more stringent accuracy requirements and falling cycle times, rapid measurement directly at the manufacturing machine is absolutely essential. With MarOpto you can measure lenses, aspheres and freeforms at the point of origin of the product – with rapid feedback to the manufacturing process to avoid waste.



MarSurf LD 130/260 Aspheric 2D and 3D

Asphere Measuring Station

DESCRIPTION

MarSurf LD 130 / LD 260. A step into a new dimension
- MarSurf LD 130 / 260 Aspheric is a high-precision 2D / 3D surface measuring station for characterizing contour and roughness on optical components. MarWin is the software used for operation and analysis.

Checks the topography in the first machining operations
- Early detection of deviations, thus avoiding costly reworking
- Differential profile output in machine-readable format for controlling the machine tool

Increased flexibility
- Different types of rotationally symmetrical aspheres can be measured with one measuring system, no additional investment required
- Large measuring range up to **260 mm** (up to 400 mm with the stitching option)
- Maximum measuring speed and dynamics (up to **10 mm/s** for large lenses / up to 0.02 mm/s for microlenses)
- Fully positionable stylus tip

Bionic-style LP D probe arm
- Improved probe system dynamics thanks to increased rigidity and attenuation as well as a lower moment of inertia:
  - Optimized overall design of the probe system
  - Innovative choice of materials
- Probe arm with integrated chip for:
  - Detecting and identifying the probe arm
  - Checking that the probe arm is inserted correctly
  - Providing information from probe arm

Your results will be right
- The high-precision MarSurf LD 130 / 260 is the basis for the accurate measurement of your workpieces. The vertical resolution of 0.8 nm and form deviations of < 100 nm guarantee the exact reproduction of your asphere.
- Probe arm change with no need to recalibrate
- Lenses with steep sides can be measured

Measurement of steep aspheres with stitching, step 1: measuring left flank of lens

For more information, please visit our website: www.mahr.com

MarForm MFU 200 Aspheric 3D

Precision 3D Measuring Station

DESCRIPTION

Mahr developed the **MarForm MFU 200 Aspheric 3D** to enable optical components to be tested in 2D / 3D quickly and close to the production area. MarForm measuring machines have been recognized for decades for their accuracy and stability.
With the **MarForm MFU 200 Aspheric 3D**, this experience has now become available to the optical industry.

Accuracy

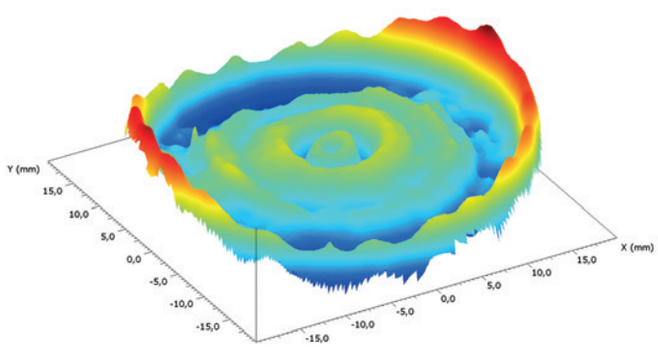
- The **MarForm MFU 200 Aspheric 3D** is a precision measuring instrument. Its very low measurement uncertainty is ideally suited to your process optimization requirements.

Measuring principle

- The **MarForm MFU 200 Aspheric 3D** measures the topography of optical components. Of course, a quick 2D measurement can also be recorded with a profile across the zenith of the lens. For 3D measurements, two linear profiles offset by 90° are first measured across the zenith of the lens in a single sequence. Then, multiple concentric polar profiles are recorded by rotating the C axis. These measuring points are used to generate a topography. Interrupted surfaces can be measured with the fully positionable probe arm.
- Using the measuring station in a vibration-cushioned cabinet keeps external interference, such as vibration and dirt, away from the measuring objects. MarWin is the software used for operation and analysis.

Measuring procedure

- Before starting the measurement, choose the nominal form type and set the parameters for the expected reference lens. In the next step, the measuring data is recorded and compared with the nominal data for the lens.
- The RMS value, PV value and slope error are shown as parameters.
- In the software, the individual parameters for the aspheres, such as the radius of curvature R0, conical constant k and the aspheric coefficients Ai, can be adjusted to the measuring results when adjusting the nominal asphere to the fit asphere.
- The differential topography between the measured values and the nominal lens is displayed as a color coded line chart. The 2D profiles and the differential topography can then be exported in known formats for correction for the machine tool.
- In addition to measuring spheres and aspheres as described above, other rotationally symmetrical objects can also be measured and evaluated using the nominal form as a conical profile or Sagitta description of a 3D scatter plot.



3D visualization of target/actual comparison

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