



SHSAUTOLAB  
PRODUCT INFORMATION

# SHSAutolab - Comprehensive Micro-optics Testing

## SHSAutolab for manufacturers of micro optics

SHSAutolab is the tool for the series testing of micro optics. It speeds up the workflow, ensures product quality thanks to reliable control measurements and also enables optimization of final optical systems that use the tested optical components. SHSAutolab keeps the total measurement time low and thus allows for 100% control of wafer-based, array-manufactured or molded micro-optics. Single elements packaged e.g. in trays can also be handled. SHSAutolab can be profitably applied for the final inspection at the manufacturer's site. Even for large quantities of micro-optical components, the manufacturer can provide complete test reports for each individual component. Obviously, the pass/fail analysis can be automated. SHSAutolab fulfills the demand for easy handling by full automation and allows for the complete mapping of the measured results.



## SHSAutolab - Automated series testing of micro-optics

The SHSAutolab platform is provided through successful cooperation of two strong business partners: AMICRA Microtechnologies and OPTOCRAFT optical metrology.



The automation and the handling of the test samples is performed by the reliable AMICRA technical equipment. As a team with many years of experience in process automation and fine mechanics, AMICRA ensures the innovative design, development and manufacturing of bonding systems as well as the implementation of process and control software.

In the SHSAutolab, high-precision handling and positioning assisted by sophisticated software for automation work seamlessly together with the optical measurement technology provided by OPTOCRAFT.

Several versions of the SHSAutolab are available to cover a wide range of optical and technical products to be tested. Individual measurement setups allow for the characterization of the test samples in a transmission or a reflection constellation. Moreover, the SHSAutolab platform can be expanded for the automated assembly of micro-optical systems. The feedback during adjustment provided by wave-front measurements and information from image processing allows for a range of assembly strategies. The usage of the SHSLab wave-front measurement technology enables high-precision measurements coupled with the suppression of external vibrations and other disturbing influences.

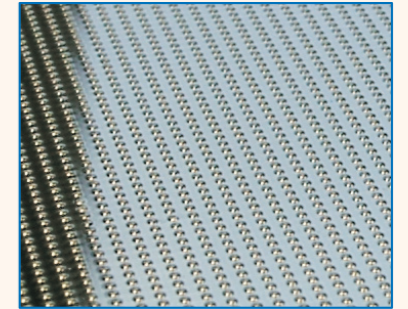
Due to its scientific background, OPTOCRAFT also provides comprehensive knowledge in the field of micro-optics and therefore is the ideal partner for R&D and production of its customers.

# SHSAutolab - Applications and Parameters

## Application in optical testing

SHSAutolab is well-qualified for the characterization of:

- Micro-lenses for telecom applications
- Lenses for optical storage applications
- Camera objectives for mobile devices
- Optics for automotive vision systems
- Miscellaneous micro lenses or micro-optical systems
- Semiconductor laser modules (e.g. VCSELs)



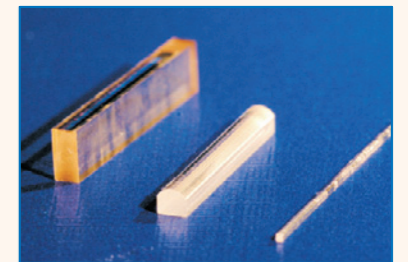
Micro lens array

## Characterization parameters

Depending on the principal measurement constellation, various parameters can be registered. All parameters can be handled by a pass-fail analysis or can for instance be mapped onto a wafer. The SHSAutolab is also capable of characterizing single elements. The following parameters can be measured:

### Transmitted light setup:

- Imaging quality: wave-front, point spread function, modulation transfer function etc.
- Imaging parameters: focal length, chromatic errors etc.
- Laser beam parameters



Refractive and GRIN cylindrical lenses

### Reflected light setup:

- Surface deviation
- Radius of curvature
- Thickness

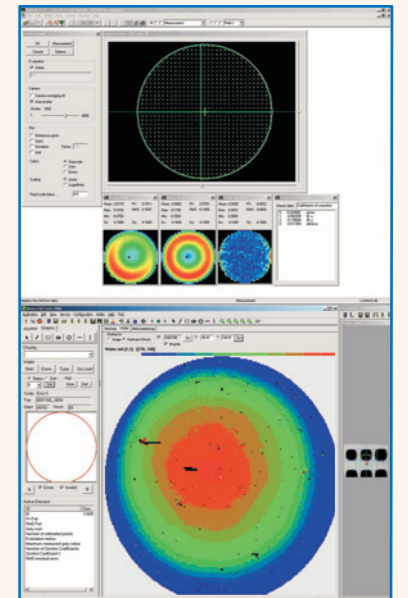
## System assembly

The SHSAutolab platform can also be used for the high-precision assembly of micro optical systems. Because both wave-front and image information are used for adjustment feedback, positioning can be optimized simultaneously for speed and final product performance.

## Software for automation and measurement

Although the SHSAutolab software provides many features for the customization of measurement and evaluation parameters, easy operation is ensured. Several automation modes for the choice of parameters allow an intuitive handling. The high dynamic range for the curvature of the wave-front and the automatic intensity control help finding the ideal measurement position even for unfavorable starting points of the prealignment.

The wide-ranging options for series measurement automation, mapping and export of data permit the seamless connection to subsequent production steps or to other tools for further evaluation. The deployment of SHSAutolab during the development speeds up the optimization of the process parameters and quickly enables a high yield.



SHSAutolab screenshot with SHSLab software and automation control software showing a wafer mapping