TRIOPTICS

TRIOPTICS · GMBH OPTICAL TEST EQUIPMENT

OptiCentric® MAX UP Bonding

Ultra Precise Measurement and Alignment Solutions for Large, Heavy Lens Systems

OptiTest

OptiSpheric

OptiCentric

OptiAngle

OptiCentric® MAX UP Bonding

The Ultimate Solution for Ultra-Accurate Alignment, Assembly and Final Inspection of Large and Heavy Lenses.

OptiCentric® systems are renowned worldwide for their measurement accuracy and their flexibility in centration measurement of single lenses and objective lenses.

With the OptiCentric® MAX UP series these strengths are transferred for the measurement of heavy and large lenses like they are used in microlithography or space optics.

OptiCentric® MAX 300 UP

OptiCentric® MAX 600 UP Bonding for lens system assembly

Since, final inspection is just one part of the lens manufacturing process TRIOPTICS has extended the capabilities of OptiCentric® MAX UP for bonding and assembling large heavy lens systems.

The TRIOPTICS automatic bonding stations extend the capabilities of the OptiCentric® System into automatic manufacturing processes of optical components and systems. The OptiCentric® MAX UP Bonding Stations include all devices necessary for the precise and automated centering and glue bonding of lenses into barrels and other optical subassemblies. In order to provide our customers with the best solution the OptiCentric® MAX UP is available for two different bonding processes: one manual for single bonding tasks and one semi-automated for recurrent production tasks.

OptiCentric® MAX UP

Centering Measurement of Large, Heavy Optics

OptiCentric® MAX UP is the centering measurement system with the highest accuracies worldwide. The whole system's design contributes to the centering measurement accuracy of 0.1 µm.

Main Advantages

- Ultra-accurate measurement of lens centration with autocollimation measuring head
- Measurement of the most important optical parameters
- Measurement of extremely large, heavy lenses
- All granite, all air-bearing construction
- Providing exceptional rigidity and thermal stability, smooth motion
- Measurement in reflection or transmission possible
- Second measurement head located below the system for extended measurement capabilities
- Fully integrated accessories e.g. measuring gauge, glue dispenser, UV illumination
- Advanced software controls the entire OptiCentric® System including upgrades, measurement, calculations and accessories
- All airbearing, all granite design

OptiCentric® MAX 300 UP centering measurement system

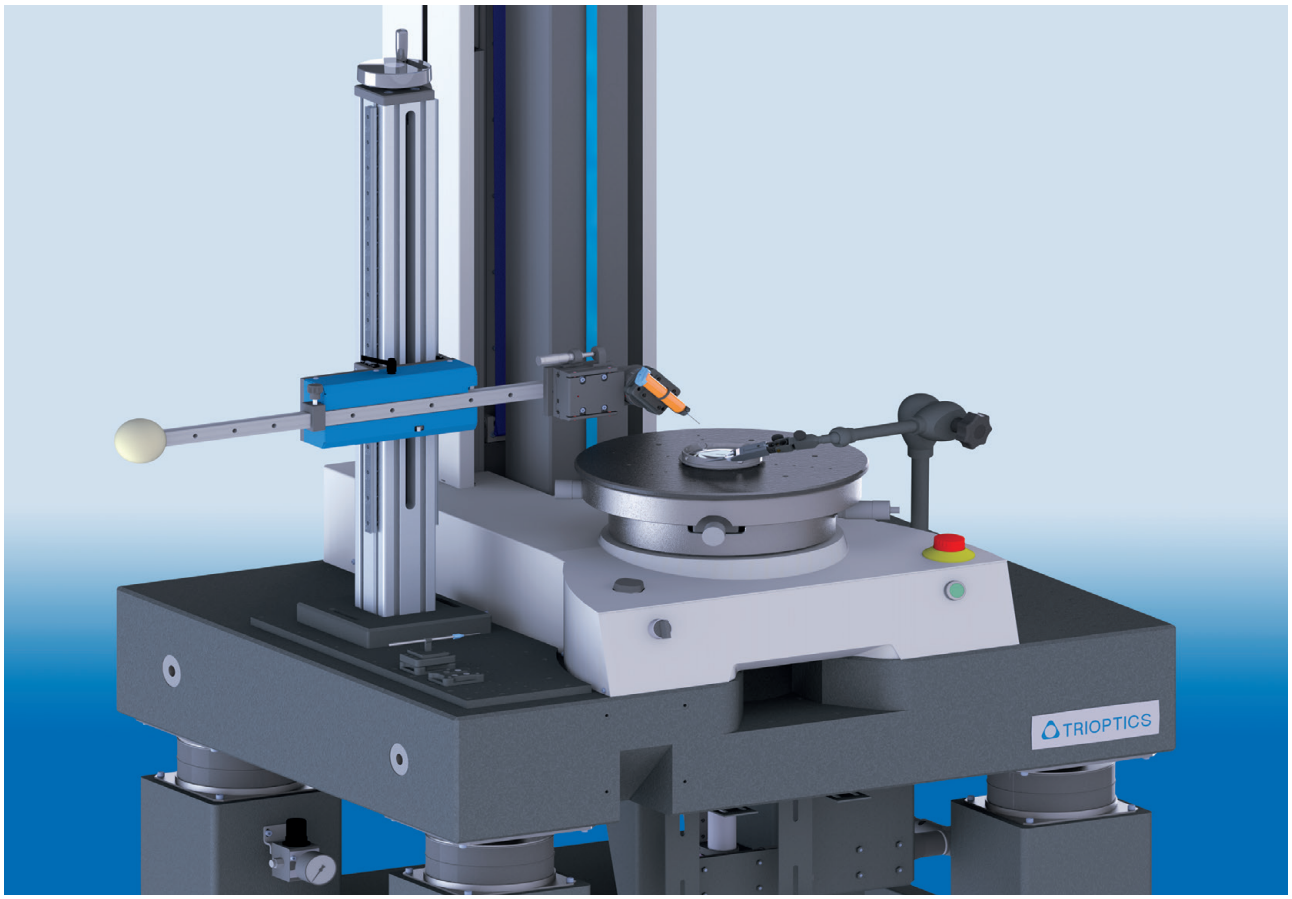
Applications

- Centration, tilt, total indicated run out (TIR)
- EFL, BFL, FFL, MTF,
- Center thickness, air-space
- Surface radius
- Spherical, aspheric, cylinder lenses
- Visible and infrared lenses

OptiCentric® MAX UP Technical Data

	OptiCentric® MAX 300 UP	OptiCentric® MAX 600 UP	OptiCentric® MAX 800 UP
Air bearing diameter	300 mm	600 mm	800 mmm
Max. sample height	1000 mm	2000 mm	On request
Max. sample weight	450 kg	900 kg	1200 kg
Centering measurement	0.1µm	0.1µm	0.1µm

OptiCentric® MAX UP Bonding



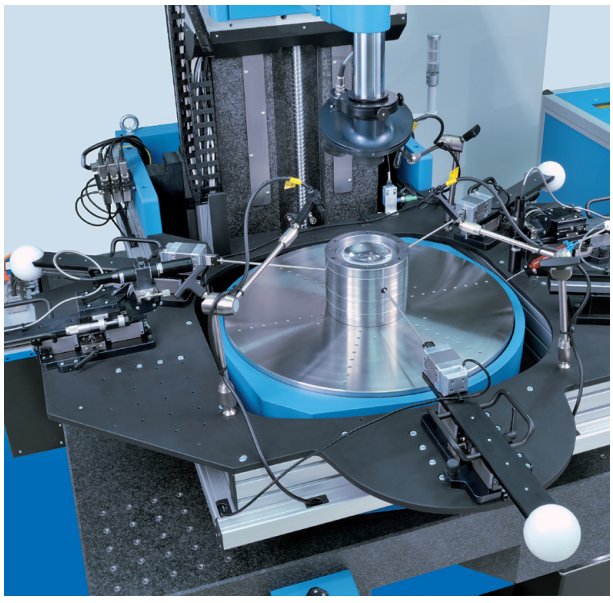
OptiCentric® MAX UP with x-z linear stage for manual bonding

OptiCentric® MAX UP systems are flexible in design and can be upgraded for bonding. Whether individual single lenses or repetitive production tasks shall be bonded TRIOPTICS offers the appropriate bonding solution.

All TRIOPTICS bonding processes benefit from the high accuracy of the measurement process and achieve unbeatable accuracies.

Manual Bonding with OptiCentric® MAX UP

For cost efficient and simple assembly of lens systems TRIOPTICS recommends a manual bonding process.



OptiCentric® MAX UP Bonding for semi-automated bonding processes

For manual lens assembling OptiCentric® MAX UP is equipped with a manual x-z linear stage with kinematic mount. The bonding tools are fixed on the kinematic mount and can be easily exchanged.

Main Advantages

- Cost efficient and accurate bonding solution
- Based on OptiCentric® MAX UP for best centering measurement results
- Stable and precise x-z linear stage
- Fast exchange of the bonding tools
- Bonding results are mostly independent from the skills of the operator
- Live monitoring of the alignment with OptiCentric® software

Upgrade for Manual Lens Assembly

Bonding devices that can be mounted on x-z stage for manual bonding:

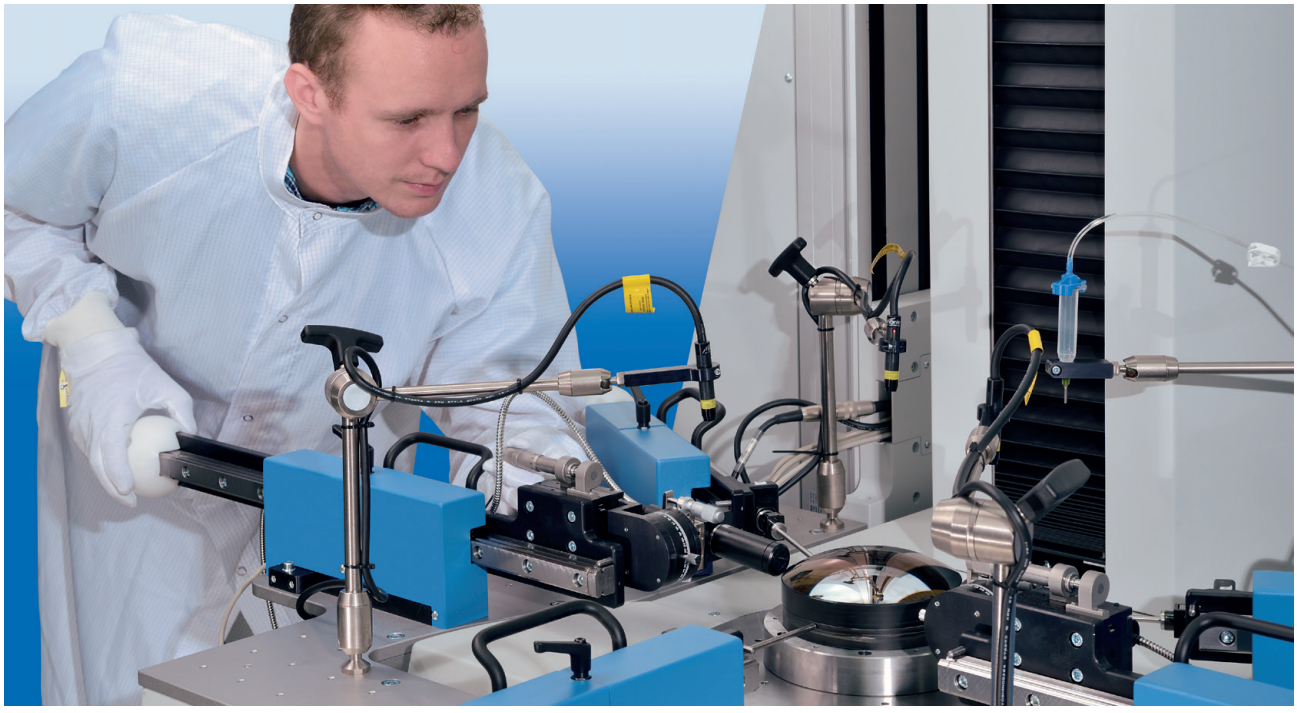
- Micrometer stage for manual alignment
- Tactile or non-tactile gauges
- Manuel glue dispenser
- UV illumination

Semi-Automated Lens Assembly with OptiCentric® MAX UP

For higher volume production tasks semi-automated bonding is the optimum choice. OptiCentric® MAX UP is upgraded for semi-automatic bonding with a frame containing all bonding tools. All tools are fully integrated and software-controlled.

Main Advantages

- Highly efficient lens assembly due to frame including all bonding tools, no need for time-consuming exchange of bonding tools
- Automated and precise positioning of the bonding frame
- Manual coarse positioning of the alignment tools, automatic and precise alignment of the lens in the barrel
- One-step alignment of optics using three linear motors orpiezo acutators
- Advanced software controls the complete OptiCentric® Bonding System including measurement, SmartAlign calculations, alignment and additional measurement



OptiCentric® MAX UP with bonding frame: three linear motors, measuring gauge, bonding equipment, UV lamps

Upgrade for Semi-Automated Lens Assembly

Flexible bonding frame fixed on the linear air bearing

- Three piezo actuators or linear motors for alignment
- Measuring gauge (tactile or non-tactile), e.g. for tilt, centering or aspherical axis or circumference measurement
- Manual or automated glue dispenser
- UV lamps
- Software upgrade that supports the bonding and lens assembly process

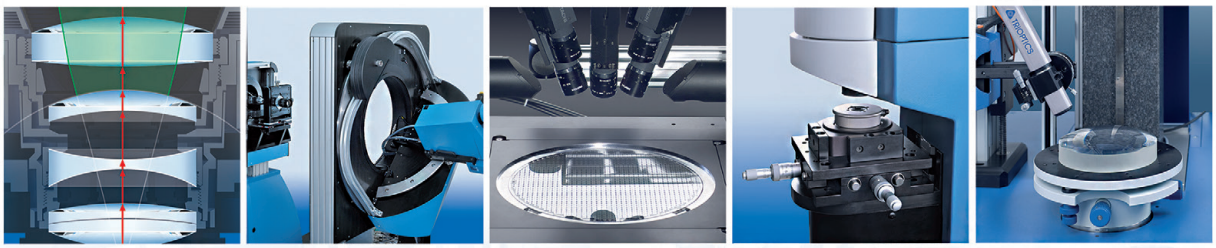
Technical Data for Bonding Processes

	Manual bonding	Semi-automated bonding
Alignment accuracy	2 µm (depending on work piece)	Better 2 µm (depending on work piece)
Alignment duration	Approx. 1 min*	15 s*

* Without glue curing time

Detailed Information about Centering Measurement

Find further information about centering measurement in reflection and transmission, typical centering errors and OptiCentric® Systems in the OptiCenteric® brochure.



Optical Metrology - The Entire Spectrum

- MTF measurement instruments
- Optical alignment, cementing and bonding
- Interferometers
- Wavefront measurement with Shack-Hartmann Sensors
- Goniometers & Spectro-goniometers
- Alignment turning stations
- Active alignment & camera module testing
- Electronic autocollimators
- Visual collimators, telescopes and autocollimators
- Ophthalmic metrology instruments
- Prisms, polygons and optical flats calibrated to international standards
- Surface topography measurement
- Customized Products

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