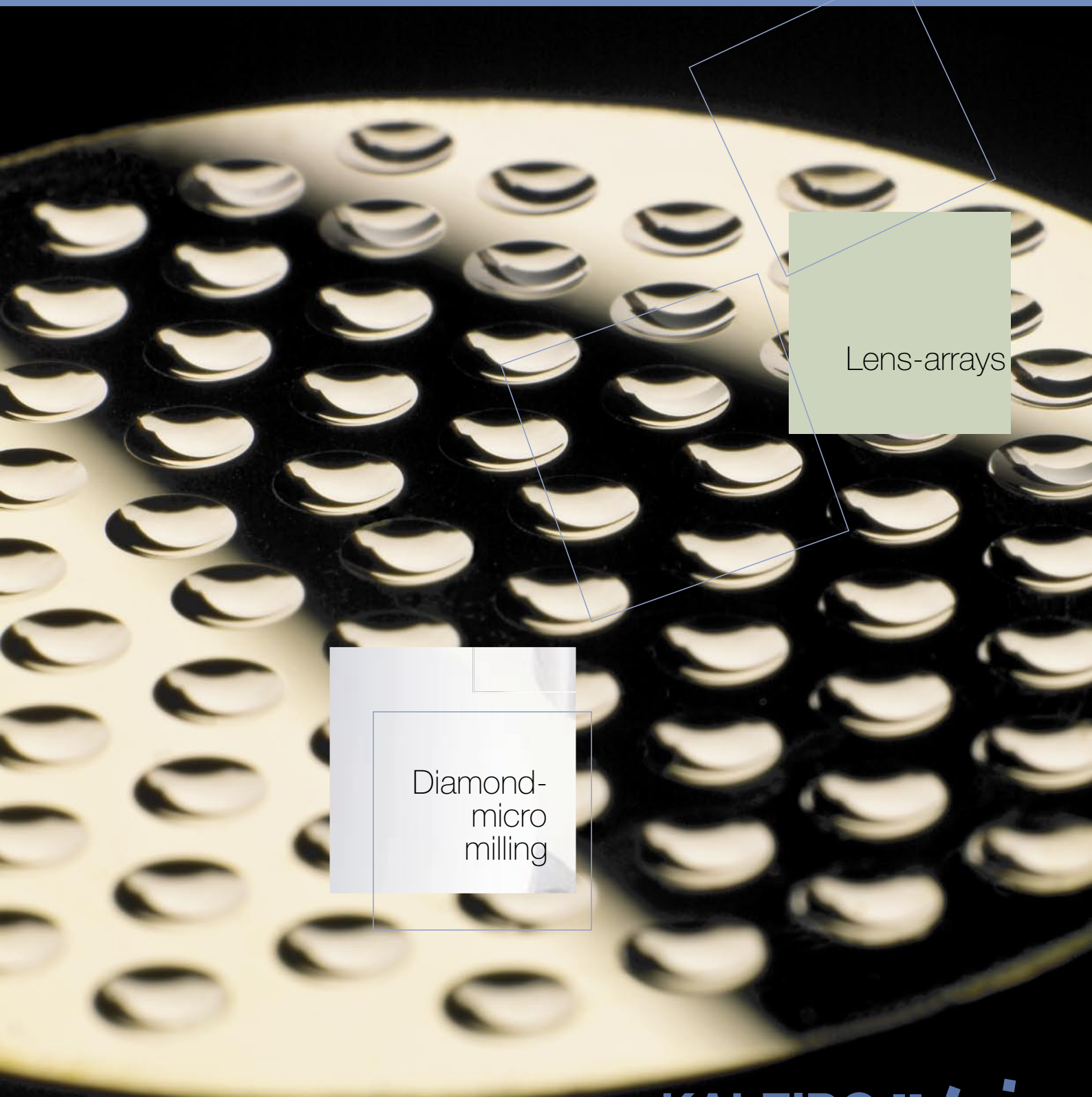


Products

# Wafer-level optics tooling



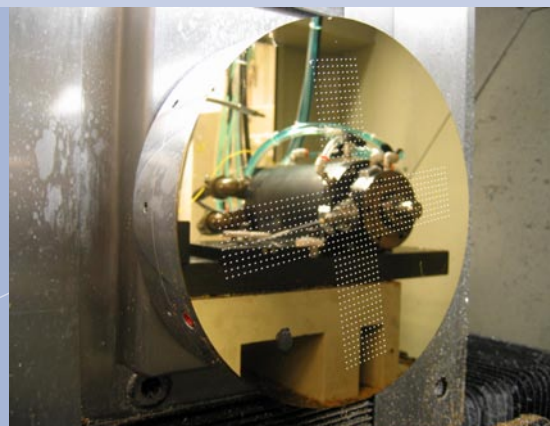
Lens-arrays

Diamond-  
micro  
milling

# Tooling for wafer-level optics

## Wafer-level lens tooling versatility

Diamond-milling of hard tools for wafer-level optics replication of lenses greatly simplifies the tooling process compared to step-and-repeat manufacturing of soft stamps. Thanks to the wide selection of milling tool geometries and set-up, diamond-milling offers a wide range of lens geometries as well as alignment mark features, that can be directly copied into the replicated soft stamp/lens wafer. Unlike etching and other methods, Kaleido's diamond milling has no limitations on lens sag heights and asphericity, and thus offers the most versatile solution available today and for the future.



Specification	Value
Max. tool dimension, diameter	300 mm
Tool thickness	0.7 mm - 10 mm
Flatness	<1 $\mu\text{m}$ total thickness variation (TTV)
Materials:	Brass, Electroless nickel, CuNi, Al
Individual lens, radius of curvature	0.1 mm < r < Infinity
Geometries	Spherical, Aspherical, Free-form (e.g. bi-conic) Concave, convex, blended (e.g. goldwing)
Lens form accuracy (PV)	< 0.2 $\mu\text{m}$
Roughness (RMS)	< 5 nm
Lens shape uniformity	< 50 nm
Lens position (absolute)	< $\pm 1.5 \mu\text{m}$ over 200 mm

## World-leading diamond micro-milling for arrays

Leveraging on its state-of-the-art ultra-precision machining systems in combination with proprietary solutions for thermal stabilization and error compensation, Kaleido Technology has taken micro-milling to unprecedented levels of accuracy.

Kaleido's proprietary software algorithms enables compensation for static and dynamic machining instabilities and ensures great uniformity for both lens shape accuracy and lens pitch control even for 200 mm and 300 mm wafer tools.

Manufacturing of hard tools in metals as a starting point for wafer-level optics offers a significant benefit over soft tools including tool life time advantages, tool wear and the possibility for adding backside features for mechanical equipment fixturing.

**KALEIDO**  
TECHNOLOGY



tel. +45 4434 7040  
fax +45 4434 7041  
[www.kaleido-technology.com](http://www.kaleido-technology.com)  
[contact@kaleido-technology.com](mailto:contact@kaleido-technology.com)

**United States:**  
So-Semi Technologies  
tel. +1-408-334-2818  
[info@so-semi.com](mailto:info@so-semi.com)

**Japan:**  
OptoSirius Corp.  
tel. +81-3-5963-6377  
[sales@optosirius.co.jp](mailto:sales@optosirius.co.jp)