ZEISS Perfect Mask Solutions
Advanced solutions for manufacturing zero-defect photomasks achieving highest yields
To ensure close geographical proximity to our customers we can rely on a dense global network of local branches and representatives. Spare part hubs in Asia, USA und Europe allow fast response times to fulfill production requirements.

Development cooperations with industry consortia as well as individual customers keep us tuned to the rapidly emerging and changing requirements of photomask technology.

ZEISS’s long-term commitment to the industry paired with our outstanding technology, engineering and support capabilities make us a reliable partner for your development and manufacturing equipment needs today and in the future.

Core expertise in light and electron optics, complemented by a pioneering femtosecond laser technology form the foundation of a product portfolio comprising in-die metrology, actinic qualification, repair, and tuning of photomasks.

Our advanced mask solutions empower our customers in the mask making industry to develop and manufacture zero defect photomasks. A suite of metrology tools, capable of measuring in-die features, allows manufacturing and qualification of masks with the largest possible process windows for wafer printing, a characteristic which is vital for improved performance and yield.

ZEISS is a leading supplier of both metrology and manufacturing equipment for the global Semiconductor Industry. With focus on a key component in the semiconductor manufacturing process, the photomask, ZEISS enables their customers to produce optimal photomasks achieving highest yields.

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The complementary product line MeRiT® enables the repair of photomask defects with the highest precision.

Based on e-beam technology the system covers opaque and clear defect repair in one platform. ZEISS MeRiT enables a superior resolution and accuracy for repair, whilst the repair process causes no unwanted transmission loss and no contamination.

ZEISS MeRiT is able to repair all mask materials including EUV photomasks.

Learn more: www.zeiss.com/mask-repair
In-die Metrology Solutions
High resolution metrology solutions to meet tighter specifications

ZEISS PROVE
Mask Registration & Metrology System

The photomask registration and overlay metrology system ZEISS PROVE measures image placement with sub-nanometer repeatability and accuracy.

The key component of ZEISS PROVE is the diffraction limited, high resolution imaging optics operating at 193 nm – corresponding to at-wavelength metrology for the majority of current and future photomask applications.

The high precision stage is actively controlled in all six degrees of freedom. The only moving part in the metrology system is the stage.

Learn more: www.zeiss.com/mask-metrology

ZEISS WLCD
Wafer Level CD Metrology System

WLCD is specially designed to measure the Critical Dimension (CD) on photomasks based on proven aerial image technology. By applying scanner equivalent illumination schemes, also supporting SMO technologies, mask manufacturers get access to the lithographically relevant CD. ZEISS WLCD addresses the steadily increasing complexity of mask design and qualifies the CD printing performance of the mask with high throughput and high degree of automation.

The aerial image CD measurement will enable wafer fabs to shorten the mask qualification time and offers comprehensive mask performance monitoring which finally increases yield.

Learn more: www.zeiss.com/mask-metrology

ZEISS CDC
Critical Dimension Control System

A narrow Lithography Process Window (LPW) is leading to an increased number of wafer process defects and to lower wafer Critical Dimension Uniformity (CDU) that very likely contribute to process yield loss.

ZEISS CDC improves the CDU and expands the LPW by tuning the photomask based on the initial wafer intra-field CDU. The system supports the leading Wafer Fabs in achieving their most advanced CDU and LPW control requirements.

Learn more: www.zeiss.com/mask-tuning

ZEISS RegC
Registration Control System

RegC® transforms scanner non correctable errors to correctable errors, enhancing the wafer On-Product Overlay performance by tuning the photomask. The innovative technology allows to meet advanced overlay requirements and eliminates the need for mask remanufacturing.

RegC® improves registration and wafer overlay performance beyond any other alternative solutions available in the market.

Learn more: www.zeiss.com/mask-tuning

Mask Tuning Solutions
Solutions to measure and improve CD Uniformity and optimize mask registration

Pattern placement of ZEISS PROVE. Hot spot analysis of critical features by ZEISS WLCD.

CDU Map measured by ZEISS WLCD. CDU Map after ZEISS CDC improvement.

Pre RegC®. Post RegC®: 50 % registration improvement.

Systematic residuals
Random residuals
ForTune® is the next generation mask and wafer tuning system that helps the IC manufacturers to meet the tightest specifications of mask registration, wafer On-Product-Overlay (OPO) and Critical Dimension Uniformity (CDU) to finally expand the Lithography Process Window (LPW). Each of these key parameters can be optimized separately or alternatively combined into one tuning solution. The concept for HVM-friendly waferless workflow of ForTune® and Pattern Fidelity Control has been already established.

Learn more: www.zeiss.com/mask-tuning

The FAVOR® platform enables productivity and reliability enhancement through intelligent automation

- Modular applications provide solutions to specific manufacturing aspects
- These solutions integrate through the FAVOR® infrastructure
- Data driven decision making and intelligent automation solutions improve productivity and reliability

ForTune® Tuning Module

The ForTune® Tuning Module enhances the performance of the ForTune® Mask Tuning System. It facilitates recipe creation as well as extensive data analysis and simulations prior to the process. This module’s versatile job handling capabilities ensure high process efficiency, superior prediction accuracy and on-the-spot decision making. The Tuning Module is a FAVOR® solution.

Key Features:
- Image Placement Error (IPE) & Overlay Control
- CDU control
- Hybrid job option
- Prediction of tuning capabilities

AIMS™ AutoAnalysis

AutoAnalysis allows for fully automated analysis of aerial images, data flow and information processing. The image processing and evaluation run in parallel to the AIMS™ measurements therefore eliminating time consuming, post measurement analysis. AutoAnalysis shortens cycle time and increases reliability ensuring your quality targets are met.

Key Features:
- Direct communication with AIMS™ tool
- Customizable analysis recipes and strategies
- Customizable report templates
- Manual interaction possible

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Productivity Enhancement Solutions
ZEISS Semiconductor Mask Solutions
Competence Centers and Distributors

About ZEISS
ZEISS is an internationally leading technology enterprise operating in the optics and optoelectronics industries. ZEISS develops and distributes semiconductor manufacturing equipment, measuring technology, microscopes, medical technology, eyeglass lenses, camera and cine lenses, binoculars and planetarium technology. With its solutions, the company constantly advances the world of optics and helps shape technological progress.

ZEISS is divided into the four segments Semiconductor Manufacturing Technology, Research & Quality Technology, Medical Technology and Vision Care/Consumer Optics. ZEISS is represented in over 40 countries – with around 30 production sites, over 50 sales and service locations and about 25 research and development facilities.

About Semiconductor Manufacturing Technology
With a broad product portfolio and globally leading know-how in the areas of lithography and optical modules, the business group covers key processes in microchip production. Semiconductor Manufacturing Technology includes three business units: the Semiconductor Manufacturing Optics, the Process Control Solutions and Semiconductor Mask Solutions.

It is headquartered in Oberkochen. During fiscal year 2015/16 this segment generated revenue of € 972 million and employed around 2,700 people.

For more information please visit us at www.zeiss.com/mask-solutions