

# Pollux



## Particle Detection for Photomasks



### Particle Detection Leads to Higher Yields

Particle contamination can disrupt and delay the photolithography process, resulting in yield and productivity losses. In order to avoid this, masks need to be routinely **re-qualified**.

The **solution is Pollux-E** – the **automated Particle Detection System** of Dr. Schenk. Pollux-E enables fabs to perform a complete inspection on each reticle prior to its use. This approach provides a more cost-effective and more reliable solution than the method of visual inspection.

### Applications

Pollux-E has been designed for integration into:

- Reticle Stockers
- Wafer Steppers
- Cleaning Stations
- Automatic Handling Systems

### Benefits

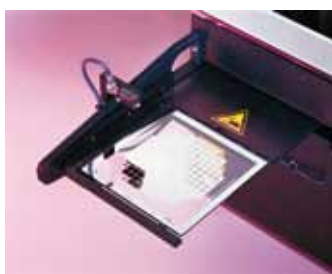
- Cost-Effectiveness
- Easy Operation
- High Speed
- Low Maintenance

### Pollux-E Offers

- High Return on Investment
- Low Capital Investment
- Low Cost of Ownership

### Pollux-E Leads to

- Process Optimization
- Yield Enhancement
- Cost Reduction



POLLUX-E

## Specification

Pollux-E inspects the surface of the glass side and the pellicle surface of the chrome side for imperfections down to 5 µm equivalent sphere diameter (ESD\*). Pollux-E detects particulate contamination and defects such as glass scratches and holes in the pellicle. Each fab can individually determine the threshold according to the minimum size of particles that are of interest.

Pollux-E offers highly reliable contamination control for the lithography process, independent of an operator performing a visual inspection. Pollux-E automatically determines the frame height and the inspection area. No manual adjustment or parameter setting is needed to adapt the system for the reticle to be inspected. The average cycle time takes between 45 to 60 seconds!

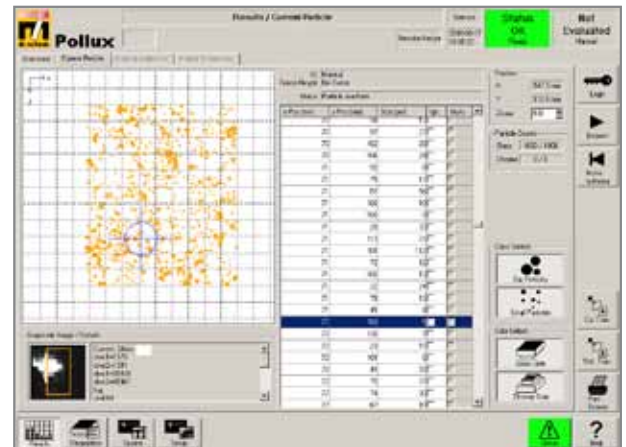
## Optical Setup

Pollux-E uses a far dark-field laser inspection principle. Highly sensitive Dual Line TDI cameras collect the scattered light from any imperfection. The size of detected particles is determined according to the number and intensity of bright pixels.

## Presentation of Results

Pollux-E offers a user-friendly graphical user interface (GUI) according to SEMI standards.

Pollux-E reports the number of detected particles on the surfaces of both sides of the reticle. Contamination data, such as the number of detected particles, ESD\* size and xy-coordinates, will be displayed in a defect map, defect table and defect size histogram, providing a quick overview.



## Conclusion

Pollux-E is a unique tool, offering objective evaluation data for the pass/fail decision of lithographic photomasks. Its low cost-of-ownership, small footprint and high speed make it an ideal solution for 100% inspection of all photomasks in a wafer fab, thus enabling process optimization and yield enhancement wherever photomasks are processed.

## Technical Data

<b>Reticle Size:</b>	6"
<b>Detectability:</b>	> 5 µm (ESD*)
<b>Repeatability:</b>	Particles 5...20 µm (ESD*) ≥ 90% Particles > 20 µm (ESD*) ≥ 98%
<b>Threshold:</b>	Adjustable by customer according to the minimum size of particles of interest
<b>Av. Cycle Time:</b>	≈ 45...60 s
<b>Autofocus:</b>	for Frame Height Detection
<b>User Interface:</b>	User-friendly GUI according to SEMI standards
<b>Communication Interface:</b>	TCP/IP Ethernet-network with Windows DCOM or ActiveX Digital I/O

<b>Cleanroom:</b>	Class 1 compatible
<b>Laser Class:</b>	Class 1 Laser and LED product
<b>Size (LxWxH):</b>	713 mm x 341 mm x 400 mm
<b>System Weight:</b>	approx. 30 kg
<b>Power Supply:</b>	100...240 VAC, 50...60 Hz, 115 VA

Electro Static Discharge safe

**CE Conformity**

**Plug and Play**

\* ESD: Equivalent Sphere Diameter

**Dr. Schenk GmbH**  
**Industriesmesstechnik**  
Einsteinstrasse 37  
(Martinsried)  
82152 Planegg, Germany

Phone: +49-89-85695-0  
Fax: +49-89-85695-200

**USA**  
Phone: +1-651-730-4090  
Fax: +1-651-730-1955

**Hong Kong**  
Phone: +852-2425-1860  
Fax: +852-2425-6775

**China - Beijing**  
Phone: +86-10-6503-2159  
Fax: +86-10-6503-2161

**China - Shanghai**  
Phone: +86-21-6163-3548  
Fax: +86-21-6163-3549

**Taiwan**  
Phone: +886-2-2920-7899  
Fax: +886-2-2920-8198

**Korea**  
Phone: +82-2-527-1633  
Fax: +82-2-527-1635