SDM-100xy

Surface Defect Monitor — Reticle & Photomask Inspection

Dark-Field Laser Scanning | 0.152µm PSL Sensitivity | Wafers, Reticles & Photomasks | 30” × 30” × 65” Cabinet

SDM-100xy with integrated laptop controller

Product Overview

The SDM-100xy is a dark-field laser surface defect monitor capable of scanning 150mm–200mm silicon wafers, reticles, photomasks, and glass substrates. Scanning the glass side of a reticle is within capability with minor modifications; pellicle scanning feasibility can be tested. All non-silicon materials require a specific calibration to ensure accurate defect size classification.

- 0.152µm PSL sensitivity — detects sub-200nm particles on wafer and reticle surfaces
- Dark-field illumination: scattered light from defects collected and analyzed for XY location & size
- Scan achieved by moving the substrate under the dark-field microscope objective stage
- Defect data mapped into a wafer/reticle image and categorized by size class histogram
- Glass-side reticle scanning supported with modification; pellicle scanning can be evaluated
- Non-silicon substrates require substrate-specific PSL calibration for accurate sizing
- Cabinet: 30” × 30” × 65” — Utilities: vacuum + 115VAC only
- 1-year warranty with Right-to-Repair service model — 95% catalogue-item components

Reticle & Photomask Inspection Capability

Glass-side scanning is within SDM-100xy capability with minor system modifications. Pellicle scanning can be evaluated for feasibility on request. All non-silicon substrate types — including fused silica reticle blanks and chrome-on-glass photomasks — require a substrate-specific PSL calibration file to ensure that defect size classification is accurate and traceable. Contact WIS to discuss calibration requirements for your specific reticle or mask type.

Technical Specifications

Scanner / Detection

Detection Method	Dark-field laser scatter
PSL Sensitivity	0.152µm (152nm)
Size Classes	0.15, 0.2, 0.3, 0.5, 1.0, 3.0, 5.0µm+
Scan Motion	XY stage — substrate moves under objective
Wafer Sizes	150mm – 200mm silicon wafers
Reticle/Mask	Glass-side scan w/ modification
Pellicle	Feasibility testing available

System & Support

Cabinet Size	30” × 30” × 65” (W×D×H)
Power	115VAC
Vacuum	Required (facility supply)
Controller	Integrated laptop + software
Warranty	1 year
Service Model	Right-to-Repair (owner-enabled)
Component BOM	95% catalogue items w/ part numbers
Tech Support	Full documentation + online support

Non-Si Substrates	Requires substrate-specific calibration
Output	XY defect map + size class histogram
Data Storage	Scan files recalled from database
Edge Exclusion	Configurable (mm)

Training	On-site technical training included
Design Philosophy	Technician-friendly, in-house repair
OEM	Silver Sage Idaho, LLC — Meridian, ID

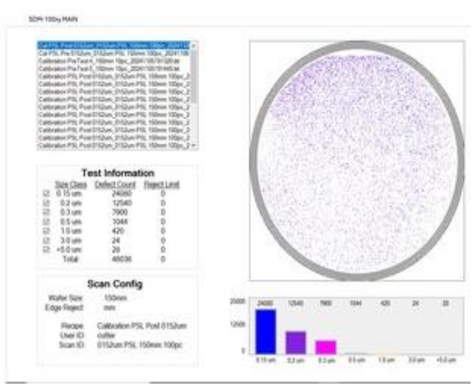
System Cabinet

Front — wafer load window & E-stop

3/4 view — cabinet with laptop controller

Rear panel — exhaust fans & I/O

0.152µm PSL Sensitivity Demonstration



Post-scan map: 0.152µm PSL deposited on upper half of 150mm wafer

Test Methodology

A 150mm reclaimed silicon wafer was pre-scanned for background count, then 0.152µm PSL particles were nebulized and deposited onto the upper half of the wafer surface. The post-scan clearly demonstrates the added defect population in the 0.15µm size class and confirms spatial sensitivity across the XY map.

Key Results:

- Pre-scan 0.15µm count: 10,400 → Post-scan: 24,080
- Defect population increase confined to PSL-deposited region
- 0.2µm and 0.3µm counts also increased due to agglomerated PSL
- Particle stream verified by PMS Lasair-110 aerosol counter
- Scan config: 150mm wafer, calibration PSL recipe, 100pc deposition

Key Features & Service Model

🔬 0.152µm Dark-Field Sensitivity

Laser scatter detection resolves PSL particles as small as 152nm. XY stage motion sweeps the substrate under the dark-field objective for full-surface defect mapping with size classification down to 0.15µm.

📊 Full Size Class Histogram

Defect events are categorized into 7 size bins (0.15µm through 5.0µm+) and displayed as a wafer map plus histogram. Operator and recalled data views support both real-time monitoring and archive review.

🏭 Compact Fab-Ready Cabinet

30” × 30” × 65” footprint with caster wheels for easy lab positioning. Requires only 115VAC and facility vacuum — no special gas, chiller, or special power drop needed.

🗺️ Reticle & Photomask Capable

Glass-side reticle scanning is achievable with minor system modifications. Pellicle scanning feasibility can be evaluated. All non-silicon materials require a dedicated PSL calibration for accurate size data.

🔧 Right-to-Repair Service Model

95% of system components are off-the-shelf catalogue items with BOM part numbers provided. Complete technical documentation, on-site training, and online support enable in-house repair without factory lead times.

1-Year Warranty

Full 1-year warranty backed by Silver Sage Idaho, LLC. Technician-friendly design minimizes downtime — the system is built so the tool owner’s in-house staff can troubleshoot and repair without waiting on factory response.