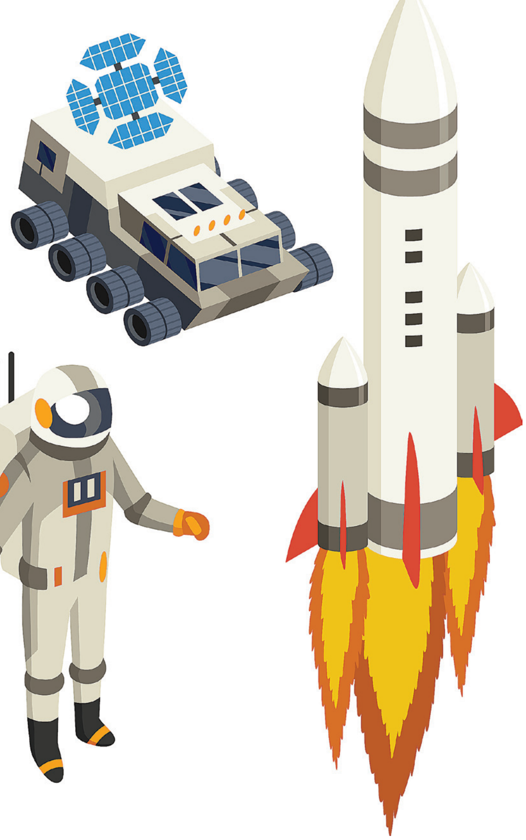
MACRO INTELLIGENCE

Insights for Increasing Yield and Reliability through Smarter Macro Defect Inspection #9

A Technical Bulletin from Microtronic – the Industry Specialists in Macro Defect Inspection

This macro defect inspection system fills the special needs of mission-critical chips.



EAGLEview helps you deliver the higher reliability needed in Defense, Aerospace and Advanced R&D applications...

Fabs serving defense, aerospace, national laboratories, and other leading-edge R&D programs often need to meet some of the most stringent requirements in the industry. In these facilities, yield is not the only concern – security, traceability, and mission-reliability can matter even more. A defect that slips through in a space-bound device may put lives and entire missions at risk.

For mission-critical devices, both the demands and the stakes are frequently much higher…

- Extreme heat (jet engines, hypersonic flight)
- High radiation (space and nuclear environments)
- Extreme cold (polar exploration, cryogenic systems)
- Prolonged vibration and stress (deep drilling, space)

In challenging environments, even small excursions like photolithography issues, edge chips, hotspots, scratches, contamination, coating anomalies and others can accelerate failure catastrophically.

Defect "sampling" is not enough – 100% defect inspection is needed

Because of speed and budget constraints, many fabs routinely utilize a "sampling" scheme for defect inspection – just looking at a small wafer section from a small sampling of total wafers in the lot…

But for mission-critical devices, sampling is not enough. Intermittent, low-frequency defects frequently evade sampling inspection. And even end-of-line electrical testing is not foolproof. By the end of processing, certain mission-threatening defects may already be buried under multiple layers, making them hard to detect and even harder to trace back to root causes.

Fortunately, EAGLEview from Microtronic has both the speed and versatility to deliver 100% macro defect inspection – allowing you to look at 100% of every wafer, in every lot, at multiple critical process steps.

Earlier detection and correction of defects and reduced excursions

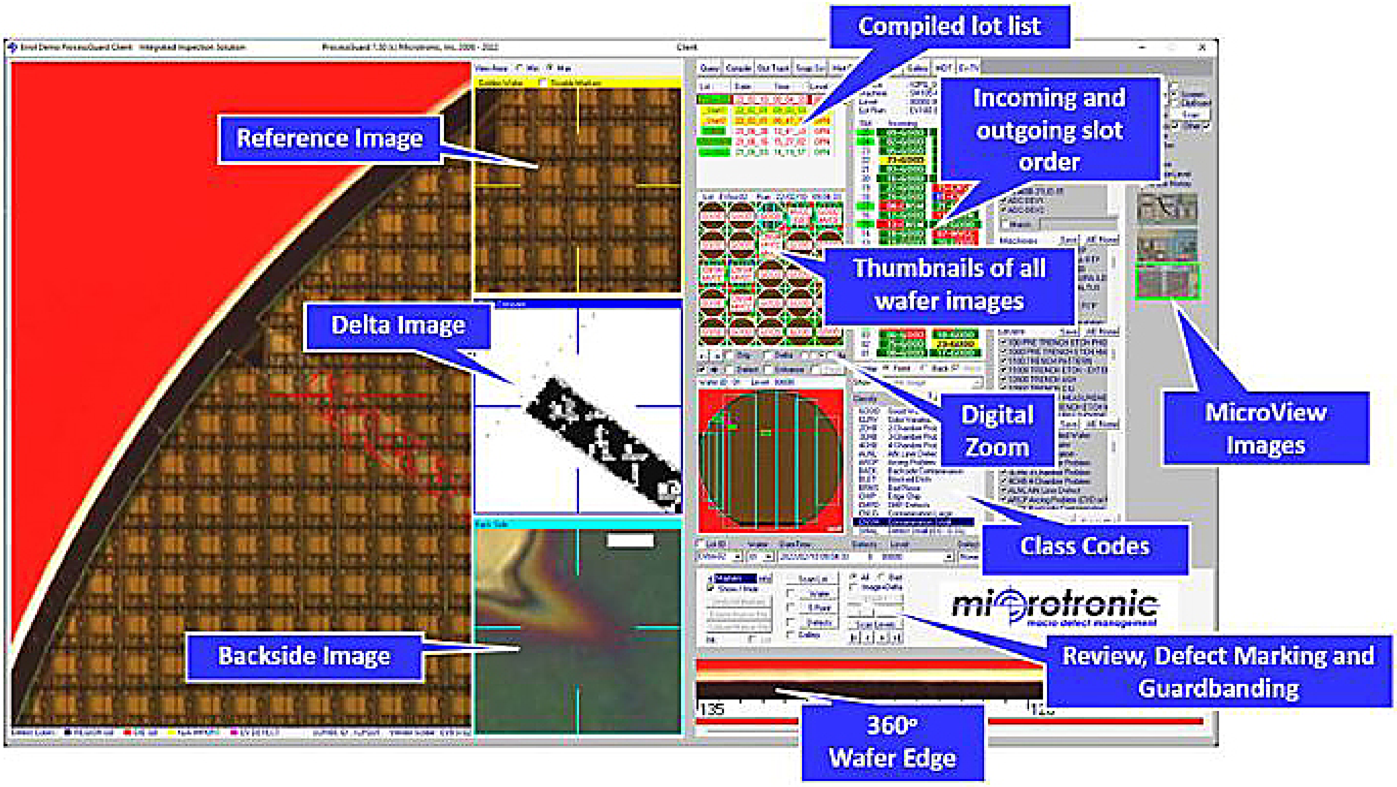
With 100% wafer inspection, EAGLEview sees more defects and excursions, and it sees them sooner. This allows you to rework and salvage more wafers, earlier – which eliminates the needless scrapping of highly valuable wafers or limited-availability materials.

Earlier detection also allows EAGLEview to more accurately pinpoint the root causes of defects. This gives you higher yield and also greater confidence in long-term device reliability. It keeps defects from becoming time-bombs hidden under later process layers.

The advantages of a safe, comprehensive defect database

Advanced devices that have a lot riding on them frequently have greater security requirements, so EAGLEview ensures that all wafer defect data is collected and maintained in one safe place.

This robust record-keeping logs and safely archives every wafer inspection event in the system's powerful ProcessGuard software. The screen below shows just a sampling of the great amount of defect inspection data maintained by ProcessGuard.



Example screen showing EAGLEview's comprehansive ProcessGuard defect information database.

EAGLEview integrates all of your fab's defect data into one easy-to-use information system, which provides a comprehensive picture of all your defect information, regardless of how many or how few ancillary inspection tools your fab may have.

All image and defect data is linked directly to the wafer ID, process step, and tool history. This helps significantly in long-term defect analysis, comparisons across lots, and post-mortem investigations. It allows fabs to pinpoint recurring defect patterns and more accurately identify the true sources of excursions.

This centralized database enables defect inspection data to be shared across the enterprise, helping all authorized engineers and researchers to collaborate very effectively – while also keeping classified or sensitive information in a single location to keep it as secure as possible.

Easy-to-use versatility that's ideal for higher-mix, lower-volume fabs

Fabs doing mission-critical work are often producing lower volumes of a higher mix of different device types. EAGLEview is particularly helpful in these environments because it quickly adapts to a range of different wafer substrates, sizes, process flows, and defect detections – without the need to create or maintain device-specific recipes.

With its combination of speed, ease of use, 100% inspection, and powerful data management, the EAGLEview helps mission-critical fabs to see and deal with more defects more quickly – to deliver higher device performance and longer-term reliability.

From the specialists in semiconductor macro defect inspection

For over 30 years Microtronic has been focused on optimizing semiconductor wafer macro defect inspection – to enhance yields, reliability, and mission assurance. To learn more about advanced defect inspection, please email us at info@microtronic.com. And to see additional Macro Intelligence tech bulletins, go to: https://www.microtronic.com/macro-intelligence-technical-bulletins.

The MACRO Specialists

microtronic

macro defect management

Microtronic Headquarters: 171 Brady Avenue, Hawthorne, NY 10532 • Microtronic.com
European Demo & Support Center: An der Moosach 7, 85376 Massenhausen, Germany