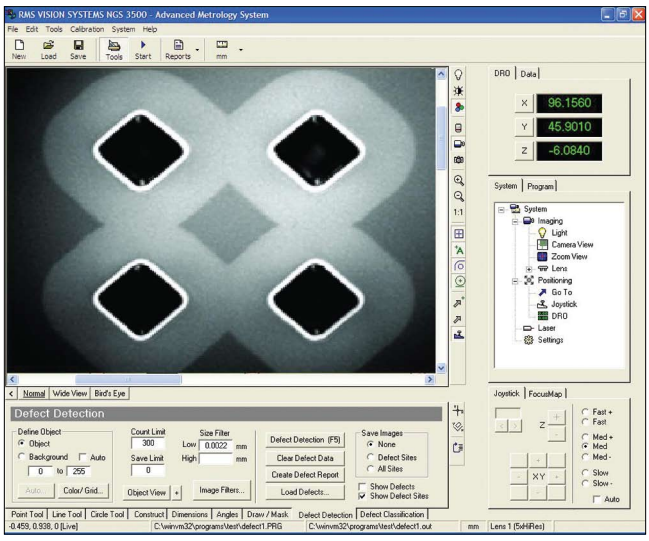
McBain DDR200 NIR and DDR300 NIR Defect Detection and Review Systems

For Near-infrared Subsurface Optical Inspection and Metrology

The McBain DDR200 NIR (for 200mm) and DDR300 NIR (for 300mm) provide high-speed defect detection and precision measurement on wafers and other parts. These cost-efficient systems offer unique advantages for both production and process development use, providing an optimum near-infrared (900-1700nm) solution when both sub-surface defect detection and dimensional metrology are required.

These DDR systems feature a powerful set of automated and semiautomated optical and digital video tools, which are optimized for high accuracy, production throughput and ease of use. The automated and versatile platform features McBain's state-of-the-art near-infrared Koehler Epi-illumination as well as optional transmitted-illumination packages. All systems are configured on McBain Systems' precision multi-axis platforms.

These systems are available with a variety of optical and illumination accessories and custom wafer/part fixtures, as well as custom data formats, reports and operator interface.



APPLICATIONS

- Bonded wafer alignment
- Die alignment (flip-chip or hybridization)
- Sub-surface defect visualization, detection, characterization
- MEMS device inspection and metrology
- 3D stacking process development and control

CAPABILITIES

- InGaAs digital camera (900-1700nm)
- NIR-optimized Koehler Epi-illumination
- Filters for specific band-pass or high-pass wavelengths (motorized optional)
- Diffusion filters for even illumination
- Polarization and analysis filters for stress characterization (motorized optional)
- Aperture and field diaphragms for image optimization (motorized optional)
- Multiple series of NIR objectives for application optimization (1x through 100x objectives, 10x to 1000x magnification)
- Submicron optical and digital resolution
- Sub-stage illumination for transmitted NIR applications
- Motorized objective turrets with recipe control
- Image-stitching for high-resolution macro image mosaics
- Semi Standard S2/S8 compliant

DDR200 NIR and DDR300 NIR Systems

FOR NIR INSPECTION & MEASUREMENT

- **In Process:** Verification of pre-bond and/or pre-hybridization on critical alignment applications such as: MEMS, wafer bonding, 3D chip stacking, crack/chip inspection and metrology
- **Post Process:** Verification, validation, inspection, and measurement of critical sub-surface features in Si, GaAs, and other NIR-transmissible materials
- **Failure Analysis:** Process development tool verification, part characterization, qualification and environmental testing

POWERFUL

- Designed for automatic / semiautomatic operation
- Extensive defect detection features and capability
- Integrated dimensional metrology features
- Able to penetrate thicker materials, more highly doped materials and rougher surfaces than other systems

PRECISE

- Submicron-precision optical measurements
- High-accuracy staging, to 20nm linear encoder resolution
- Highest resolution 900-1700nm InGaAs digital camera in class:
  - 640 x 512 pixel, nominal resolution (standard configuration)
  - 320 x 256 pixel, nominal resolution (optional to reduce cost)

FAST

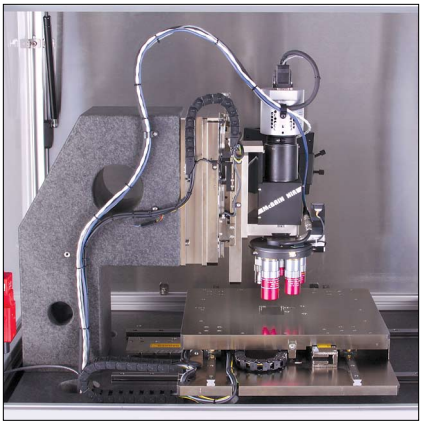
- High-speed linear servo motor staging
- 50-500 defects/measurement/second per field of view, typical

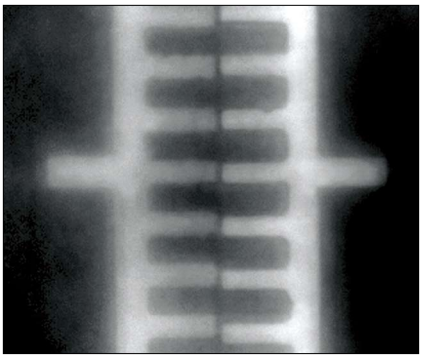
USER-FRIENDLY

- Very easy to use, program and set up
- Highly visual data with rich color graphics and video

FLEXIBLE

- Multi NIR band-pass capable (900-1700nm)
- Polarization-ready
- Transmitted illumination packages available
- Under/over systems available
- Powerful software optimization tools
- Multiple wafer/die/part handling systems available
- Ergonomic system and platform
- Application-specific customizable software





NIR image of alignment structures in a pair of bonded silicon wafers

McBain's NIR imaging software interface delivers best-in-class image clarity for accurate measurement of alignment structures. The semiautomated software routines allow the user to pre-program different inspection routines, which can be easily recalled. Accurate, immediate alignment information provides real-time quality control of bonding processes.

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