

AW200™ Series C-SAM®

Automated Wafer Bond Inspection



Non-Immersion Imaging
via Sonoscan's Waterfall™ transducer reduces contamination and false bond indications.

Operator-Free Inspection, Analysis and Sorting

The AW200™ Series is an advanced instrument specialized for wafer bond applications. It delivers a better than 5 micron sensitivity, a throughput that is approximately two times faster than competitive systems, and a non-immersion scanner that eliminates false positives due to contaminate ingress. The AW200 Series automatically handles, inspects and sorts bonded wafers based on user-defined accept/reject criteria.



Features

- Sonoscan Waterfall™ transducer provides non-immersion scanning which minimizes risks of contamination and false bond indications
- Dual (2) high-precision robot arms with vacuum pickup end effectors maximize total throughput by efficiently automating the entire inspection process—including aligning, delivery, drying and sorting
- Functions with up to three 25-wafer cassettes (two for loading/unloading and one for reject) for larger batch capacity
- Universal cassette interface platform capable of handling wafers from 125mm to 200mm in diameter. Platforms for smaller wafer sizes are also available
- Sonoscan automated analysis software accurately determines percent bond/nonbonded, void size and count, and automatic accept/reject based on user-defined criteria
- Matched 500 MHz bandwidth pulser/receiver and ultra-high resolution transducers rapidly generate superior images as both are designed and manufactured by Sonoscan for optimum performance
- Self-contained water and vacuum unit option quickly provides these capabilities when hook-ups are not available
- Class 1000 clean room ready



Automated Wafer Handling
with dual (2) high-precision robot arms for the highest throughput rates.



AW200™ Series C-SAM®

The AW200™ Series is a high-capacity, high-throughput automated C-SAM® system designed to deliver maximum sensitivity for the evaluation of bonded wafers in applications such as SOI, MEMS and others. Since the materials used in these applications are very transparent to ultrasound, Sonoscan uses proprietary high acoustic frequency lenses, which are designed in-house, to obtain the most detailed images. The AW200 Series can detect voids smaller than 5 microns in diameter between two wafers and delamination with the separation between the wafers as thin as 200 Angstroms.



The system is designed to handle wafers bonded by virtually any method, including direct fusion, anodic, glass frit and epoxy bonding. For direct bond techniques, users of the system have found that yields can be significantly improved by inspecting at three production stages—after initial bonding by Van der Waals forces, after annealing and after thinning.

The AW200 Series delivers fully automated inspection. Wafers up to 200mm in diameter are loaded via two standard wafer cassettes. Dual robot arms with vacuum pickup end effectors transfer the wafers first to the aligner and then to the scan stage for acoustic inspection. The entire wafer area is scanned using Sonoscan's proprietary Waterfall™ Transducer, which provides non-immersion scanning and reduces the risks of contamination and false bond indications. If inspection is performed after metallization has been applied, the acoustic image can be overlaid onto a wafer map. This method relates void, bond and other defects to the individual die.

After completing the scan of each bonded wafer pair, typically two to three minutes, the wafer is passed through a set of air knives to remove excess water. While drying, Sonoscan's automated analysis software analyzes the data. Based on your chosen accept/reject criteria, the bonded wafer is either placed back into one of the "accept" cassettes or in a third "reject" cassette. At the same time this is occurring, thanks to the dual robot arms, the second wafer has already been loaded and is being scanned. By minimizing time between scans, the AW200 Series helps maximize throughput.



Leaders in Nondestructive Internal Inspection

Since its inception, Sonoscan has focused on developing superior Acoustic Micro Imaging (AMI) technology to help our customers build higher quality products. Sonoscan remains the most trusted authority on the application of AMI for nondestructive internal inspection and analysis, and holds more US and foreign patents related to AMI technology than any other manufacturer.

Sonoscan Delivers:

- **Superior Image Quality** by being the only AMI company with our own transducer/lens development lab and fabrication facility
- **Extraordinary Data Accuracy** through our proprietary signal processing algorithms, analysis functions and color maps
- **High Throughput Rates** by developing the most advanced features and instruments
- **Unsurpassed Technical Expertise** with more than 20 dedicated and highly experienced AMI applications engineers on staff

For a complete list of AW200™ specifications, please contact Sonoscan at 847.437.6400.