Orbotech Ultra Fusion™ 200

Automated Optical Inspection (AOI) System

Orbotech Ultra Fusion 200

Orbotech Ultra Fusion 200 delivers leading-edge AOI performance for advanced IC substrate production down to 15µm. Featuring powerful Multi-Image™ technology, the system achieves the highest levels of detection accuracy and operational efficiency required for successful production of today's complex applications.

Benefits

Superior Detection Accuracy with Multi-image Technology

- Simultaneous acquisition of multiple images using different illumination sources
- Unprecedented detection of the finest defects
- Up to 70% false alarm reduction

Robust Inspection Performance Down to 15µm

- High throughput at all resolutions
- Patented vacuum table
- On-line defect verification

Intuitive Operation with Smart Setup™

- Intuitive – visual categorization of defects
- Short – single cycle process (non-iterative)
- Optimal – automatic generation of all setup parameters

Major Running Cost Savings

- Low cost per scan with maximum production efficiency
- Minimum verification requirements
- Less consumables, power and floor space

Dust and fine-short

Dust and fine-short look the same

Clear distinction between dust and fine-short (dust is much brighter)

Technologies   **Multi-Image**™ Technology

Superior Detection Accuracy with Multi-Image Technology

Featuring powerful Multi-Image technology, Orbotech Ultra Fusion 200 achieves a major reduction in false alarms of up to 70% compared to conventional AOI results. The system utilizes an innovative optical head specially-designed to accommodate the requirements of semi-additive process (SAP/mSAP) and any-layer structures. A patented LED based illumination system ensures dome-shaped, uniform light coverage.

Unlike conventional, gray-scale AOI, Orbotech Ultra Fusion 200 performs inspection using different lights and from different angles, revealing details unseen by other systems. Illuminating the panel with different wavelengths makes it possible to accurately classify materials such as clean copper, oxidized copper, dust and laminate. While two different defects might look the same under one illumination source, the true difference is revealed under the second illumination. By accurately detecting the subtle differences between actual defects and false alarms, Orbotech Ultra Fusion 200 achieves highest detection results without compromising on throughput.

Robust Inspection Performance Down to 15µm

Orbotech Ultra Fusion 200 is ready for the challenging demands of IC substrate and advanced HDI production with fine resolutions down to 15µm at high throughput. A patented vacuum table supports a wide variety of materials for maximum inspection flexibility. With on-line verification capabilities built into the system, Orbotech Ultra Fusion 200 provides fast and easy access to the defect area, reducing handling damage and scrap.

Intuitive Operation with Smart Setup

The system's Smart Setup operation transforms the traditional AOI setup process – from trial and error to a single cycle with minimal process steps. The result is an intuitive, short and optimal setup.

Without the need for an expert, the operator visually categorizes critical and non-critical defects on the first panel of a job and Smart Setup automatically does the rest. Based on KLA's field-proven panel understanding capabilities, Smart Setup accurately classifies every feature then builds the optimal setup and configures all relevant parameters accordingly.

Major Running Cost Savings

Designed for maximum production efficiency, Orbotech Ultra Fusion achieves a low cost per scan for IC substrate and advanced HDI inspection and ensures much lower final product scrap. Verification operations and other running costs are greatly reduced, including less consumables (no bulbs), maintenance time, power, air consumption and floor space.

Specifications

Technology Range	Down to 0.6mil (15µm) line & space
Inspected Products	**Inner layers:** Signal, power & ground, mixed, cross shielding, inner with holes, buildup **Outer layers:** Signal, mixed, cross shielding, buildup **Chip carrier panels:** FC-BGA, PBGA, FC-CSP, COF **Build-up layers:** Laservias (conformal and non-conformal masks)
Inspected Materials	**Conventional:** Bare copper (shiny, matte), etched additive or plated copper, reverse treated foil (RTF), double-treated copper, gold-plated conductors. Any laminate including FR4, Tetra function, Teflon, Roger, etc. **Flex material:** Polyimide, polyester **Advanced build-up board materials:** RCC, ABF, BT, ALIVH **Photoresist:** Blue, purple & brown
Detected Defects	Shorts, opens, minimum line/space violations, nicks, protrusions, dishdowns, copper splashes, pinholes, missing or excess features, wrong size and position of features, clearance and split plane violations, blocked holes, annular ring violations, SMT violations, black spots, wire bonding pad defects, flip chip pad defects, defects in through blind vias
Inspection Methods	Full reference comparison - Multi-Image technology – analysis of images taken from multiple illumination sources - Model-based, contour comparison and specific criteria per feature - Full multi-layer panel understanding (SIP-based)
Panel Dimensions	**Thickness range:** 1-300mil (25-7,500µm) **Maximum panel size/ Inspected area:** 24" x 30" (610mm x 762mm)
Defect Verification	**Verification and repair stations:** Orbotech VeriSmart™, Orbotech VeriWide™, Orbotech VeriFine™, Orbotech VeriSmart™-A, Orbotech VeriWide™-A, Orbotech VeriFine™-A, Orbotech Ultra VeriFine™-A **On-system verification:** built-in video camera
Automatic Defect Shaping	Orbotech AOS solutions: Orbotech Precise™, Orbotech PerFix™ and Orbotech Ultra PerFix™ Series
Setup Data Sources	CAM
Panel Registration Method	Pinless registration – panel edge alignment and Online dynamic registration
Options	Marker and stamper 2D barcode reader Automation ready - RMIV Pro option - 2D metrology
Dimensions (W x D x H)	161cm x 178cm x 186cm
Weight	900Kg

Specifications are subject to change without notice.
Orbotech Ultra Fusion™ 200 is a class-1 laser product.