



Orbotech Fusion™ 22

Automated Optical Inspection (AOI) System

Fusion. Nothing But the Truth.

Orbotech Fusion 22 creates a true revolution in PCB inspection performance. Utilizing breakthrough Multi-Image™ technology, Orbotech Fusion 22 inspects a panel multiple times in one scan for unparalleled detection accuracy and the lowest false alarm level. Designed for HDI applications, Orbotech Fusion 22 redefines PCB production efficiency, while achieving a low cost per scan.

Benefits

Superior Detection Accuracy with Multi-Image Technology

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

Intuitive Operation with Smart Setup™

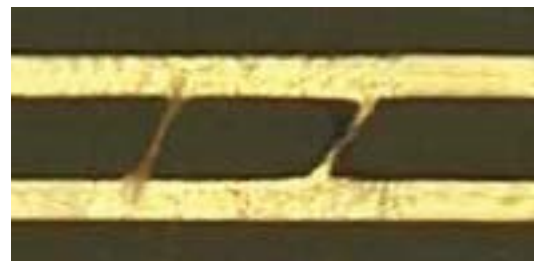
- Intuitive – visual categorization of defects
- Short – single cycle process (non-iterative)
- Optimal – automatic generation of all setup parameters

Robust Performance

- Resolution down to 25µm line and space
- High throughput at all resolutions
- Patented vacuum table
- On-line defect verification

Major Running Cost Savings

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



Microscope image - dust and fine short



Red light image - dust and fine short look the same



Blue light image - clear distinction between dust and fine short (dust is much brighter)



Superior Detection Accuracy with Multi-Image Technology

Featuring powerful Multi-Image technology, Orbotech Fusion 22 achieves a major reduction in false alarms of up to 70% compared to conventional AOI results. Its innovative optical head is specially-designed to accommodate a range of HDI applications. A patented, dome-shaped light diffusing lens ensures uniform light coverage.

Unlike conventional, gray-scale AOI, Orbotech Fusion 22 performs inspection using different lights and from different angles with a combination of red and blue color illumination channels, revealing details unseen by other systems.

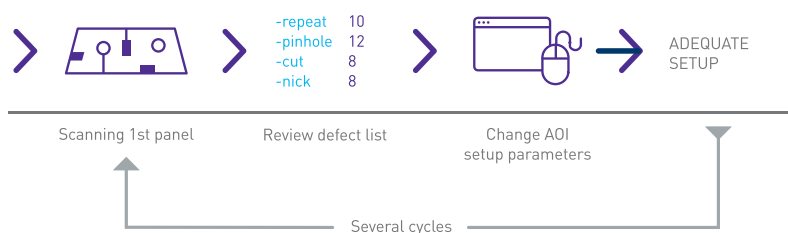
Illuminating the panel with different wavelengths makes it possible to accurately classify materials such as clean copper, oxidized copper, dirt and laminate. While two different defects might look the same under one illumination source, the true difference is revealed under another one. By accurately detecting the subtle differences between actual defects and false alarms, Orbotech Fusion 22 achieves highest detection results without compromising on throughput.

Intuitive Operation with Smart Setup

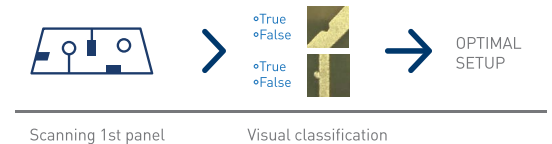
Orbotech Fusion 22's Smart Setup transforms the traditional AOI setup process - from trial and error to a single cycle with minimal steps.

Without the need for an expert, the operator can visually categorize true and false defects on the first panel of a job, then Smart Setup automatically does the rest. With KLA's advanced panel understanding capabilities, Smart Setup accurately categorizes the defects into groups and sorts them according to severity, from the most critical to the least. It then builds the optimal setup and automatically configures all relevant parameters accordingly. The result in an intuitive, optimal and much shorter setup process that increases the effective AOI throughput.

Setup process with other AOIs



Smart Setup with Orbotech Fusion



Robust Performance

Orbotech Fusion 22 is ready for the most advanced challenges of HDI production, handling resolutions down to 25µm on the widest range of materials at high throughput. A patented vacuum table ensures maximum inspection flexibility. With online verification capabilities built into the system, Orbotech Fusion 22 provides fast and easy access to the defect area, reducing handling damage and scrap.

Major Running Cost Savings

Designed for maximum production efficiency, Orbotech Fusion 22 introduces a low cost per scan. A breakthrough in detection accuracy with no compromise on speed ensures much lower final product scrap. Verification expenditures 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 1mil (25µm) line/space																					
Inspected Products	Inner layers: Signal, power & ground, mixed, cross shielding, inner with holes, buildup Outer layers: Signal, mixed, cross shielding, buildup 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) Large table*- 32.5" x 30" (825mm x 762mm)																					
Throughput	<table border="1"> <tr> <td>Line width (mil) →</td> <td>4</td> <td>3</td> <td>2.0</td> <td>1.5</td> <td>1.2</td> <td>1</td> </tr> <tr> <td>Line width (µm) →</td> <td>100</td> <td>75</td> <td>50</td> <td>38</td> <td>30</td> <td>25</td> </tr> <tr> <td>Sides/hour</td> <td>240</td> <td>220</td> <td>200</td> <td>175</td> <td>120</td> <td>105</td> </tr> </table> <p>Based on panel size: 18" x 24" (457mm x 610mm) with 1" margin panel size and standard table format</p>	Line width (mil) →	4	3	2.0	1.5	1.2	1	Line width (µm) →	100	75	50	38	30	25	Sides/hour	240	220	200	175	120	105
Line width (mil) →	4	3	2.0	1.5	1.2	1																
Line width (µm) →	100	75	50	38	30	25																
Sides/hour	240	220	200	175	120	105																
Defect Verification	Verification and repair stations: Orbotech VeriSmart™, Orbotech VeriWide™, Orbotech VeriFine™, Orbotech VeriSmart™-A, Orbotech VeriWide™-A, Orbotech VeriFine™-A, On-system verification: built-in video camera																					
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	Stamper/market, automation ready, large table* (32.5" x 30")																					
Dimensions (W x D x H)	161cm x 178cm x 186cm (Large table*: 161cm x 220cm x 186cm)																					
Weight	900Kg (Large table* 920 Kg)																					

* Not upgradable from the existing Orbotech Fusion AOI

Specifications are subject to change without notice.
Orbotech Fusion 22 is class-1 laser product.

KLA SUPPORT

Maintaining system productivity is an integral part of KLA's yield optimization solution. Efforts in this area include system maintenance, global supply chain management, cost reduction and obsolescence mitigation, system relocation, performance and productivity enhancements, and certified tool resale.

© 2022 KLA Corporation. All rights reserved worldwide. KLA reserves the right to change the hardware and/or software specifications without notice. Orbotech is a registered trademark of Orbotech Limited, a KLA company. KLA and the KLA logo are registered trademarks of KLA Corporation. All brands or product names may be trademarks of their respective companies.

KLA Corporation
One Technology Drive
Milpitas, CA 95035
www.kla.com

Rev 3.0_6-22-2022