

Fusion™ 22 AOI System



Fusion™ 22

Taking Orbotech's AOI expertise a major step forward, Fusion 22 creates a true revolution in PCB inspection. Utilizing breakthrough Multi-Image Technology™, Fusion 22 inspects a panel multiple times in one scan for unparalleled detection accuracy. Designed for high-end HDI applications, Fusion 22 re-defines PCB production efficiency, while achieving lowest cost per scan.



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)



Benefits

True Detection Accuracy with Multi-Image Technology™

- Simultaneous acquisition of multiple images using different illumination sources
- Superb detection of the finest features
- Significantly lower level of false alarms

True Intuitive Operation with Smart Setup

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

True Performance

- Resolution down to 25µm line and space
- Highest throughput at all resolutions
- Support for a wide variety of materials using patented vacuum table
- On-system defect verification with fast and easy access to the defect area

True Running Cost Savings

- Lowest cost per scan with maximum production efficiency
- Minimum need of verification operation
- Minimal requirements for consumables, power and floor space

Fusion. Nothing But The Truth.



True Detection Accuracy with Multi-Image Technology™



Featuring new Multi-Image Technology, Fusion 22 represents a technological leap in all aspects of AOI design and capabilities, enabling true detection accuracy. New innovations include an advanced optical head featuring wide-angle, dome-shaped light coverage, patented light source and light diffusing lens, specially-designed image capturing lens and patented multi-image acquisition techniques.

Unlike conventional, grey-scale AOI, Fusion 22 simultaneously inspects each PCB panel under different lights and from different angles, revealing details unseen by other systems. Acquiring multiple images on-the-fly, without compromising on throughput, Fusion 22 detects the subtle differences between actual defects and false alarms.

Illuminating the panel with different wave lengths 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. With Multi-Image Technology, Fusion 22 correctly classifies true defects and false alarms and dramatically improves detection accuracy.

True Intuitive Operation with Smart Setup

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

Without the need for an expert, the operator visually categorizes true and false defects on the first panel of a job and Smart Setup automatically does the rest. Taking Orbotech's field-proven panel understanding capabilities to the next level, Smart Setup accurately categorizes every feature, then builds the optimal setup which independently influences each feature group and configures all relevant parameters accordingly.

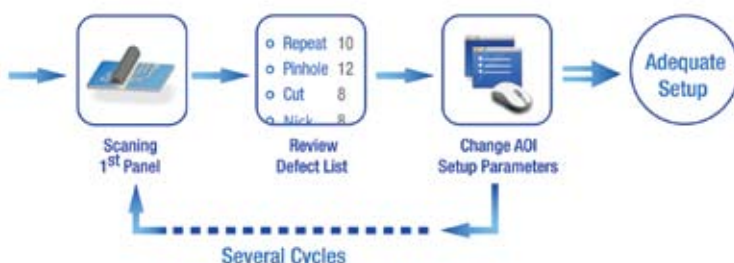
True Performance

Fusion 22 is ready for the most advanced challenges of HDI production today and in the future, handling resolutions down to 25µm on the widest range of materials with highest throughput. A patented vacuum table ensures maximal inspection flexibility. With on-line verification capabilities built into the system, Fusion 22 provides fast and easy access to the defect area, reducing handling damage and scrap.

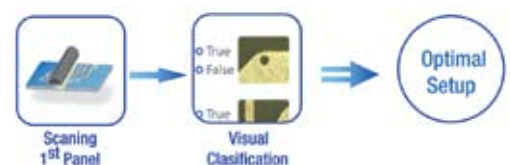
True Running Cost Savings

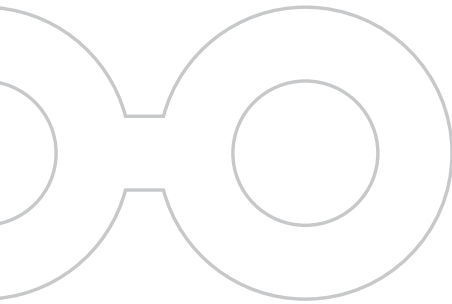
Designed for maximum production efficiency, Fusion 22 introduces the lowest cost-per-scan ever. Breakthrough detection accuracy with no compromise on speed ensures much lower final product scrap, verification expenditures and operational costs including consumables (no bulbs), maintenance time, power and air consumption and floor space. Fusion 22 delivers superior results on even the most complex HDI jobs, while meeting your demanding cost, quality and time-to-market requirements.

Setup process with other AOIs



Smart Setup with Fusion





Specifications:

Technology Range	Down to 1mil (25µm) line & space
Products Inspected	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)
Materials Inspected	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: Any laminate including RCC Photoresist: Blue, purple & brown
Defects Detected	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
Inspection Methods	Full reference comparison <ul style="list-style-type: none"> • 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 (25-7500µm) Max. panel size/ inspected area: 26" x 30" (660 x 762mm)
Throughput	Line width (mil) > 4 3 2 1.5 1.2 1 100 75 50 38 30 25 Sides/hour 240 220 200 175 120 105 Based on panel size: 18" x 24" (457mm x 610mm) with 1" margin
Defect Verification	Verification and repair stations: VeriSmart™, VeriWide™, VeriFine™, VeriSmart™-A, VeriWide™-A, VeriFine™-A,™-5m, VRS-5, VRS-5st, VRS-4Pro. On-system verification: built-in video camera
Defect Repair	PerFix™
Setup Data Sources	CAM
Panel Registration Method	Pinless registration – panel edge alignment
Options	Full pattern blind via inspection Automation ready

Specifications are subject to change without notice
 Fusion 22 system is class-1 laser product. Laser specification: red diode, 635nm, 1 mWatt max power.

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