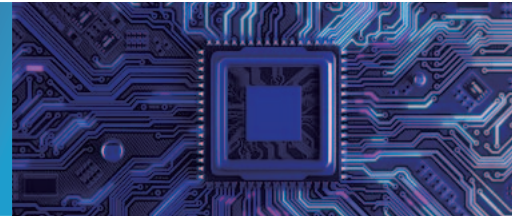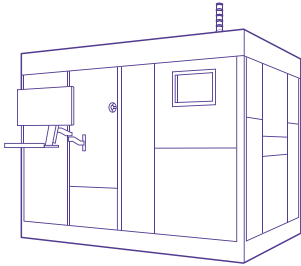KLA+

PCB & ICS Product Overview

Lumina™ Inspection and Metrology

- Defect inspection and metrology, optimized for advanced ICS, including glass core and through glass via (TGV) and panel redistribution layer (RDL)
- Detection and measurements across a wide range of applications and defect types
- High-sensitivity capture of unique defect types with Omnisphere™ illumination, enhanced area camera and multi-modality scanning capabilities
- Detectability of the most challenging defects
- Full defects of interest detection coverage in a single scan, with low false alarm rate (FAR) and setup flexibility for each modality throughout the product life cycle (PLC) phase
- VRS-less, resource-lean verification
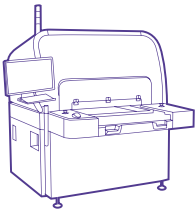- Support for current and future production needs

Omnisphere™ Technology

Multi-Modality Imaging™ Technology

EcoNet™ – In-scan actionable and customizable automatic defect classification (ADC)*

*Optional feature

Orbotech Ultra Dimension™ AOI

- Unique inspection capabilities–powered by Triple Vision™ and Magic™ technologies
- Next generation remote multi-image verification (RMIV Pro)
- Integrated, automated 2D metrology
- Low total cost of ownership (TCO), Industry 4.0-ready

Magic™ Technology

Triple Vision™ Technology

Orbotech Ultra Dimension™ 900 – ultra fine pattern and laser-via (LV) inspection and operational efficiency for IC substrate AOI-AOS suite
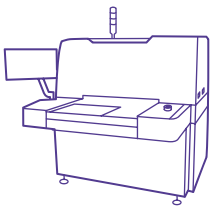
Orbotech Ultra Dimension™ LV – inspection and measurement of LV panels in a single scan down to 30µm laser via diameter

Orbotech Ultra Dimension™ 800/700 – pattern and laser via inspection in a single scan for SLP/mSAP, advanced HDI, flex and ICS down to 10/15µm L/S accordingly

Orbotech Precise™ AOS

- One-stop automated solution for shaping open and short defects
- Significant yield and savings increase by eliminating scrap PCBs
- High-quality shaping enabled by proprietary 3D shaping (3DS)™ and closed loop shaping (CLS)™ technologies
- For mass production of SLP/mSAP, advanced high-density interconnect (HDI), HDI and multi-layered boards (MLB) down to 30µm L/S for open defects and 25µm L/S for short defects
- All-defect coverage, including inner and outer layers, multiple lines, corners and pads

3DS™ Technology

CLS™ Technology

Orbotech PerFix™ AOS
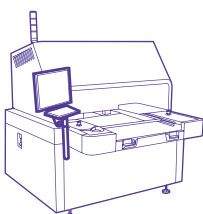
- Scrap saving - enables excess copper defect shaping
- High quality with closed loop shaping (CLS)™ technology
- High speed automated shaping

Orbotech Ultra PerFix™ 500P – for the most advanced IC substrates and fine line applications down to 5µm L/S

**Orbotech Ultra PerFix™ 170i** – for advanced IC substrates and fine line applications down to 7µm L/S

Orbotech Ultra PerFix™ 120N – high throughput for IC substrates, SLP/mSAP and advanced flex down to 10µm L/S

Orbotech PerFix™ 200S/200S XL – for mass production of complex HDI and MLB down to 30µm L/S, supporting up to 30" x 36.5" (XL model)

Orbotech PerFix™ R2R – for flex PCB production with roll-to-roll automation and sheet-by-sheet mode down to 25µm L/S

CLS™ Technology

Corus™ DI
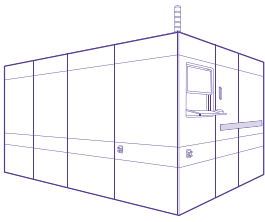
- Innovative fully automated, double-sided imaging solution that replaces a complete DI line
- Super-fine line; high depth-of-focus for best line quality on varying surface topographies
- High-speed, multi-target acquisition for any layout, ensuring high productivity
- Exceptional positioning accuracy enabled by high precision design and scaling algorithms
- Closed and compact solution for maximum cleanliness and efficiency (capacity per m^2)

COMING SOON Fine-line (down to 6 um) mass prodution DI for flip-chip chip scale package (FC-CSP) and advanced HDI

Corus™ 8R – fine-line (down to 8 µm) mass production DI for advanced HDI and ICS (core layers, modules)

Corus™ 15M – mass production DI (down to 10µm) for HDI and advanced MLB

DSI™ Technology

LSO™ Technology

MultiWave Laser™ Technology

Serena™ Direct Imaging (DI)
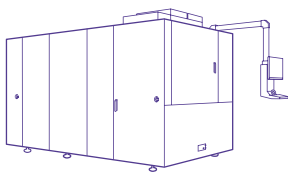
- Ideal for large unit size, high layer counts and fine ABF substrates
- Superior line quality on warped, uneven topography panels
- Optimized layer-to-layer alignment with improved panel dimension control
- High throughput, even with multiple alignment marks
- Compatible with various materials (e.g, conventional resists, PID, SM)

Orbotech Infinitum™ DI
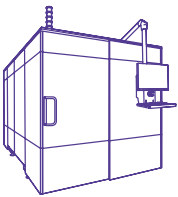
- Groundbreaking roll-to-roll direct imaging solution for mass production of flex PCBs
- Unique drum-based R2R DI driven by KLA's drum direct imaging (DDI)™ technology for optimal material handling and high yield
- High throughput enabled by high-speed, continuous imaging and on-the-fly registration
- Superior line quality and uniformity achieved by KLA's field-proven large scan optics (LSO)™ and MultiWave Laser™ technologies
- All-in-one – compact, clean, closed and eco-friendly for extreme efficiency and cleanliness

Orbotech Infinitum™ 10XT – up to 520mm roll width

DDI™ Technology

LSO™ Technology

MultiWave Laser™ Technology

Orbotech Nuvogo™ DI
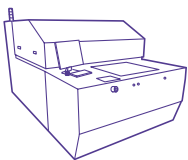
- High imaging quality with large scan optics (LSO)™ technology - fine feature imaging, high uniformity and high depth of focus
- MultiWave Laser™ technology for high resist flexibility
- High throughput enabled by dual table mechanism and high-speed target acquisition
- Advanced scaling modes for high registration accuracy

Orbotech Nuvogo™ Fine Series – fine resolution mass production for SLP/mSAP, advanced HDI and flex applications with high imaging quality and throughput

Orbotech Nuvogo™ Series – high power mass production for HDI, flex, rigid-flex, MLB and QTA PCBs

LSO™ Technology

MultiWave Laser™ Technology

Orbotech Diamond™ DI for SM
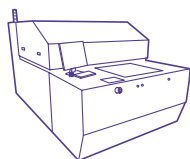
- High-capacity, high-throughput solder mask DI solution
- SolderFast™ technology for high throughput and excellent imaging quality
- Sophisticated optical mechanism enabling high depth of focus for image quality for the most challenging surface topographies
- Low total cost of ownership – long lifetime LEDs to reduce operational costs

Orbotech Diamond™ 10/10XL – mass production solder mask DI with 3-wavelength light source

Orbotech Diamond™ 10W – high-capacity, high-quality solution dedicated to white solder mask and optimized for miniLED production

Orbotech Diamond™ 10M/10MXL – high-capacity, high-quality solution for both white and non-white solder masks

SolderFast™ Technology

Zeta™-6xx Panel 2D/3D Metrology
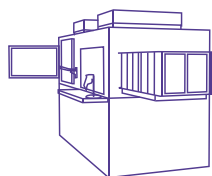
- Automated, fast and non-contact metrology
- True color 2D and 3D profiling with robust ZDot™ technology
- Direct thickness measurement of ABF and other non-transparent layers with ZIR technology
- High warpage panel handling by customizable advanced chuck

## ICOS™ T3/T8 Component Inspection and Metrology for Singulated IC Substrates
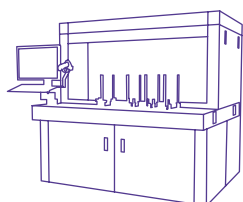
- Single platform for warpage measurement (pad coplanarity) and AVI (top and bottom)
- High resolution color imaging for optimal defect detection (cracks, particles, discoloration, dents, bulges)
- High accuracy and repeatability for pad coplanarity measurements
- Optimal yield with AI-enabled automatic sorting

Quali-Fill® Libra® Online Chemical Management System
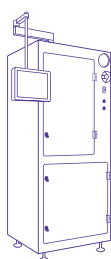
- Specifically engineered for electroplating and electroless deposition in advanced packaging
- Designed to quantify material properties in plating solutions like Ni, Cu, SnAg
- Configurable, modular design which supports various types of manufacturing lines—and multiple tanks
- Detect and quantify contaminants like photoresist, additive by-products and trace foreign metals
- High value, parallel analysis of various chemistries

QualiLab Elite® Plating Bath Analyzer
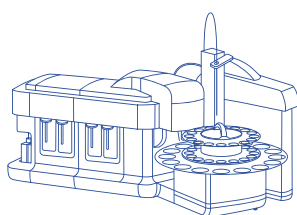
- Combines CVS, Titration and Spectroscopy in a single lab analyzer
- Ideal for electrolytic and electro-less plating baths
- Provides accurate analysis for easy replenishment and improved yield from your plating solutions.
- "Get Me Expert" feature provides easily accessible factory support and remote troubleshooting
- Three modular design configurations ranging from a compact, manual analyzer to a fully automated closed-cell system

QualiLab Elite® V10 – single sample analyzer
QualiLab Elite® V20 – semi-automatic analyzer for up to 10 samples
QualiLab Elite® V30 – automatic CVS-analyzer for up to 48 samples

KLA+

Orbotech Neos™ InkJet for Solder Mask
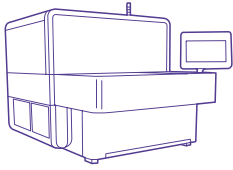
- An innovative eco-friendly additive printing (AP) solution for solder mask (SM)
- Simplifies SM process and drastically cuts time to market
- Powered by KLA's groundbreaking Structural Printing™ technology and field-proven DotStream Pro™ technology
- Ensures consistent quality and reliability of the SM layer, while enabling a decreased total cost of ownership (TCO)

DotStream Pro™ Technology   **Structural Printing™** Technology

Orbotech Magna™ Additive Printing

- Advanced inkjet printing for IC Packaging, dams, insulation layers, marking and more
- Down to 75µm line width and high aspect ratio (>1:4) for multiple processes and applications
- Low Cost of Ownership - saving more than 30% vs traditional process
- Compact system supporting strip, panel, JEDEC tray, wafer
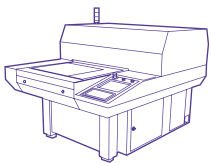
DotStream Pro™ Technology   **MultiPrinting™** Technology   **Structural Printing™** Technology

Orbotech Sprint™ Inkjet

- DotStream Pro™ technology for maximum performance and low total cost of operation
- Eco-friendly production tool, from QTA to mass production with top quality and accuracy
- Advanced traceability and fine 2D barcode printing (replacing laser marking)
- Field proven low cost per print for better yield and savings compared to other technologies
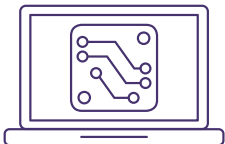
DotStream Pro™ Technology   **MultiPrinting™** Technology

Frontline CAM, Engineering and Data Analytics Software Solutions

Frontline InShop® – Design-Based, AI-driven Data Analytics solution, with cross-domain analytics engine. Frontline InShop is targeting yield optimization for mass production and enabling development of new IC substrate and PLP technologies.

Frontline InCAM®Pro – High-precision and high-throughput CAM solution for PCB and IC substrate manufacturers to improve yields and stay on top of fast-changing market conditions. Accelerated analysis and optimization workflow via a cloud-based solution.

Frontline InFlow® – All-in-one engineering automation, supports highest design complexity and accelerates time-to-market.

Frontline InSight PCB® – Fast and accurate web-based pre-CAM solution for sales and engineering