Orbotech Ultra PerFix™ 170i

Automated Optical Shaping (AOS)

Orbotech Ultra PerFix 170i

Orbotech Ultra PerFix 170i automatically shapes excess copper defects down to 7µm, enabling manufacturers to cut operational costs, save scrap, improve yields and achieve a competitive return on investment (ROI). Designed for mass production of complex fine-line IC substrates, Orbotech Ultra PerFix 170i achieves high quality, accurate results with minimum peripheral damage for even the most challenging high aspect ratio lines.

Benefits

Maximum Scrap Saving

- Perfect shaping of shorts and excess copper defects down to 7µm
- Major yield improvement on the most advanced fine line applications
- High quality results on CSP, FC-CSP, BGA and FC-BGA designs and high aspect ratio lines (conductive lines where the height is approximately twice the size of the width)

Superior Quality Driven By:

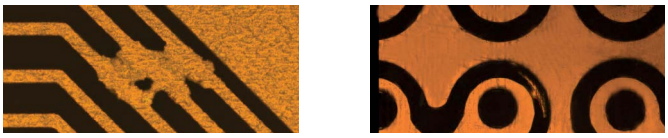
- Closed Loop Shaping™ (CLS) technology enabling an automated, iterative and controlled process
- Minimum penetration and damage to laminate

Robust Performance

- Utilizes KLA's patented, high performance laser technologies
- Fast setup enables switching jobs easily
- Push to shape (P2S) - automated defect handling provides consistent results with significant operational cost savings

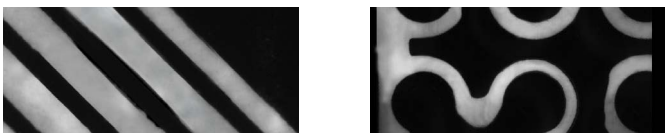
Connectivity

- Seamless connectivity with KLA's AOI, RMIV Pro and verification systems
- Connectivity with 3rd party solutions



Before shaping

After shaping white light image



After shaping UV light image

Maximum Scrap Saving

Increasing production yields on CSP, FC-CSP, BGA and FC-BGA and fine line jobs, Orbotech Ultra PerFix 170i saves IC substrates that would otherwise have to be scrapped. Utilizing state-of-the-art technologies, Orbotech Ultra PerFix 170i shapes any type of short or excess copper defect, including those on corners, ball areas, multiple lines and high aspect ratio lines, without damaging the shaping area. By comparing the defect to the CAM data in real-time, Orbotech Ultra PerFix 170i shapes the panel according to its original design and functionality. Thoroughly tested to meet the highest industry standards, Orbotech Ultra PerFix 170i's results meet strict manufacturing specifications including electrical characteristics and durability.

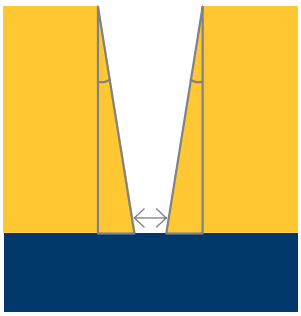
Superior Quality

One of the key's to Orbotech Ultra PerFix 170i's exceptional accuracy and speed is Closed Loop Shaping (CLS) technology. The full, 3-step cycle of image acquisition, image analysis and laser ablation is repeated until the shaping is perfect, with no damage to conductors and minimum penetration of the laminate.

Based on innovative mechanics, optics and algorithms, KLA's new shaping technology prevents undesired penetration (typically less than 5µml and damage to the laminate).

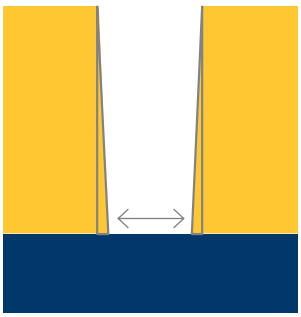
This technology enables shaping between high aspect ratio lines to bring the lines and space back to their intended dimensions and design with near-perpendicular walls

Standard processs



Non-KLA AOS

Orbotech Ultra PerFix 170i



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Significant Operational Cost Saving with Push to Shape

Push to shape (P2S) technology enables a fully automated shaping process at the single press of a button. With P2S, the operator only needs to load/unload the panel and press "Shape". As a result, one operator can manage several systems simultaneously thereby saving manpower, enhancing productivity and reducing operational costs and total cost of ownership (TCO). P2S is also an enabler for a fully automated production environment with no human intervention. P2S utilizes Closed Loop Shaping™ (CLS) technology, enabling repeatable and consistently high quality results every time.

Robust Performance

Orbotech Ultra PerFix 170i can typically shape more than 80 fine line defects per hour*. The advanced laser system design emits high-frequency pulses combined with patented, ultra-fast moving mirrors for optimal control. An innovative optical mechanism maximizes laser intensity and accuracy to ensure superior laser performance on a variety of materials. Orbotech Ultra PerFix 170i's fast setup enables easy switching between jobs.

Connectivity

Connecting with all KLA solutions, Orbotech Ultra PerFix 170i is able to shape all excess copper defects detected along the IC substrate production line. KLA AOI or verification stations are able to automatically send defect coordinates to Orbotech UltraPerFix 170i, simplifying the process and maximizing the shaping time. KLA can also receive defect coordinates from third-party AOI systems.

*** Based on use cases with ABF**

Specifications

Technology Range	Down to 7µm line/space, high aspect ratio			
Excess Copper Shaping	**Any excess copper including:** shorts, protrusions, copper splashes, minimum space violations, excess features, wrong-larger size of features, under-etched features, under solder mask short defects			
Material	**Laminates:** FR4, FR5, Tetra function, ABF, most types of BT, polyimide, liquid/dry film PID, transparent			
Typical Penetration to Laminate	< 5µm			
Panel Dimensions	**Maximum panel size/shaped area:** 762mm x 610mm **Panel thickness:** 50-10,000µm			
Throughput*	**Copper Thickness**	**Defect Size (µm)**	**Shaping per Hour**	**Shaping Time**
	18µm	10x40 (W x L)	80	40 sec
Image Processing Methods	Full reference comparison SIP Technology™			
Ablation Method	KLA's Closed Loop Shape (CLS) technology			
Setup Data Sources	CAM inspection and classification criteria from AOI and verification stations			
Defect Access Tools	Orbotech VeriSmart™ series & Orbotech AOI defect file Universal access (defect coordinates, laser pointer for marked defects)			
Panel Registration Method	Pinless registration - panel edge alignment, pin alignment			
Options	RIV, control center, barcode reader			
Verification Stations Supported	Orbotech VeriSmart™, Orbotech VeriSmart™-A, Orbotech VeriSmart™R2R, Orbotech VeriFine™, Orbotech VeriFine™-A, Orbotech VeriWide™, Orbotech VeriWide™-A, Orbotech Ultra VeriFine™-A, 3rd party VRS			
Dimensions (L x W x H)	161cm x 184cm x 186cm			

* Based on use cases with ABF

Specifications are subject to change without notice
Orbotech Ultra PerFix 170i system is a 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.

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