MPM

Electronic Assembly Equipment

ITW EAE

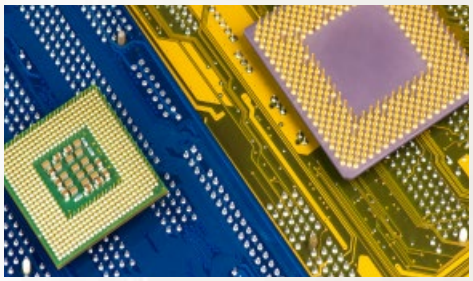
Edison II ACT

Automatic Changeover Technology

PATENTED INNOVATION

Simple to use, easy to adopt, scaleable solution for automation.

More efficient and productive manufacturing operation, reducing costs and increasing throughput.



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Edison II ACT

Edison II ACT is integrated with automated changeover technology that is fast and consistent with reduced operator requirements resulting in error-free changeover, and increased yield and throughput.

Edison II ACT is designed to be easy to use, simple to adopt, and less skill to operate. This innovative and cost-effective solution can be implemented in progressive stages towards full automation.

Unmatched Accuracy and Throughput

The MPM® Edison™ II ACT is the industries' most accurate printer with ±8 micron alignment, and ±15 micron wet print repeatability (≥2 Cpk @ 6 sigma) proven through 3rd party Print Capability Analysis (PCA) testing.

Edison II ACT delivers unmatched 15 second total cycle time made possible with parallel processing capability.

Intueri GUI and OpenApps 4.0

MPM Intueri is a simple, intuitive operator interface with a flexible, wide array of configuration variables. It is combined with OpenApps which provides a customizable portal to Industry 4.0 connectivity.

Automatic Changeover Technology

Progressive stages toward full automation

Manufacturers are at different stages on the journey to a lights out factory operation. Our solution is designed to accommodate these differences with a tiered offering best suited for individual use cases. You can start with the Edison II ACT base machine and upgrade it with features to meet your automation adoption timing.

High-volume manufacturers will benefit from automated paste cartridge and stencil changeover benefits. High mix manufacturers will benefit from automated support tooling and stencil changeover as well as stencil and paste cartridge changeover.

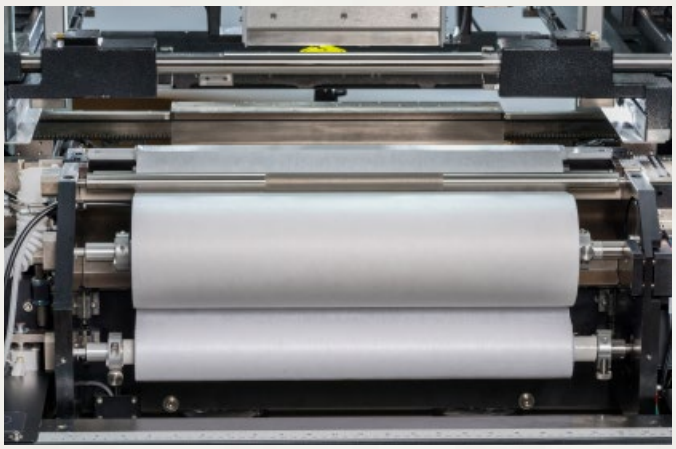
Assist cart

The addition of a cart offers assistance with handling changeover items.

Edison II ACT Base Machine

The Edison II ACT base machine includes a paste drip tray that extends under the squeegees to prevent paste dripping while traveling over open apertures or across tooling. The tray is removeable for cleaning. It also features a quick load, self-sealing paste dispenser for accommodating the automated paste cartridge changeover.

The Edison II ACT includes an ultra-fast, high-efficiency wiping system with an extra-large (65m) paper roll which will typically last multiple shifts. Patented paper tension control provides more effective wiping, and a separate wiping and printing zone prevents cross contamination.



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Verification and Traceability

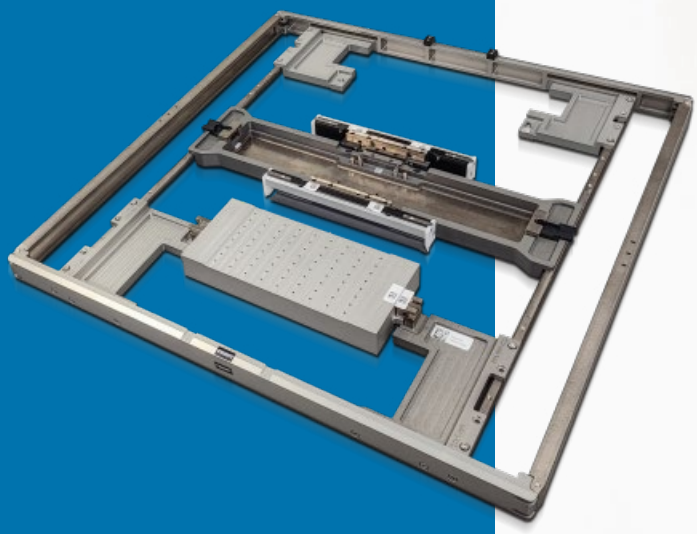
Built-in scanners and OpenApps provide data acquisition and connectivity for traceability of process or sophisticated monitoring and control of production lines. Everything put into the printer is validated and recorded by a built-in barcode scanner. The software will flag and alert the operator if any items are not correct for the selected process. A fully automated changeover process with all incoming materials scanned and verified results in error-free changeover and higher yields.

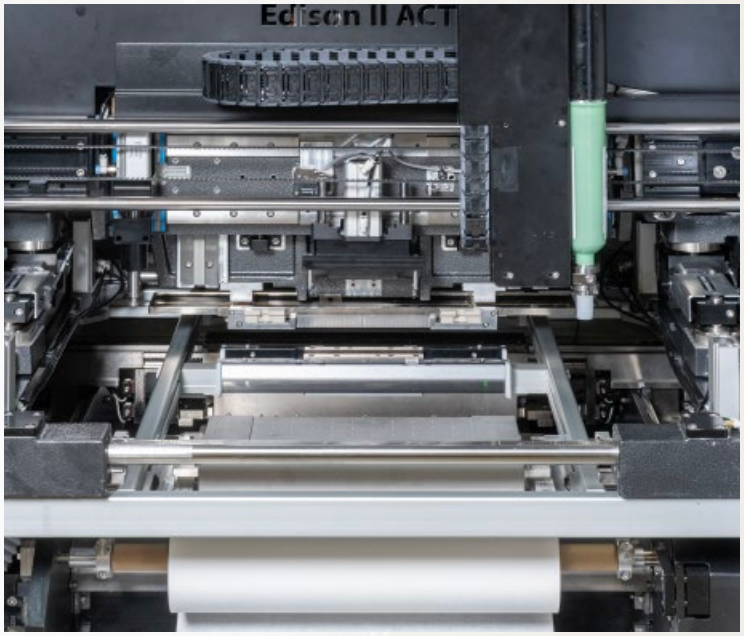
Automated Paste Changeover

The automated paste changeover system features a carousel that holds three 12 oz. or 6 oz. cartridges. The printer unloads the used cartridge into the carousel which then spins into position for a new cartridge to be loaded. A built-in barcode scanner verifies that the correct cartridge is being loaded. A side door on the printer allows loading and removal of cartridges on the fly without stopping production. Indicator lights above the door lets the operator know if the correct paste for the selected process is loaded or if a cartridge is missing or needs attention.

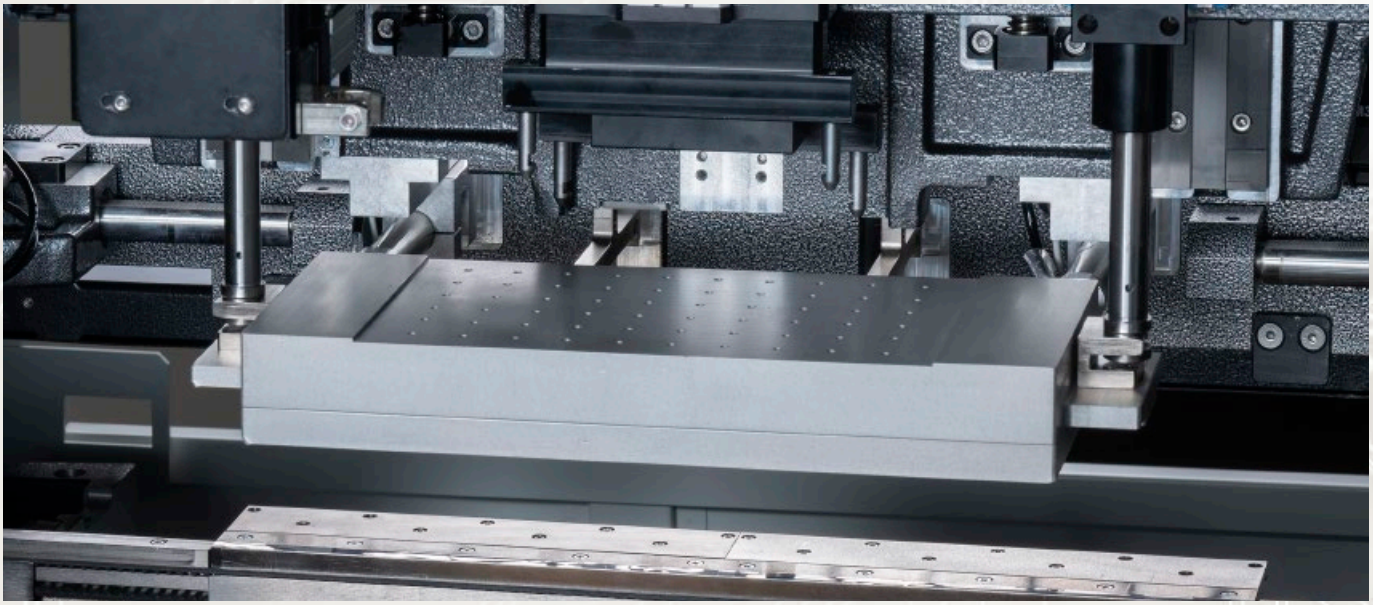
Automated Stencil, Squeegee and Tooling Changeover

Edison II ACT completely automates the changeover of the stencil, tooling, and squeegees. It provides a fast and consistent changeover without opening the hood of machine to access inside. The operator removes the current run stencil from the printer and then loads a tray that holds the next run squeegees and tooling. The Edison II ACT then automatically removes the current run squeegees and support tooling and loads them onto the tray. The printer then automatically installs the next run items, and the operator removes the tray. Lastly, the next run stencil is loaded, and the changeover is complete. Edison II ACT eliminates operator error and reduces labor dependency.





Automatic Changeover Technology

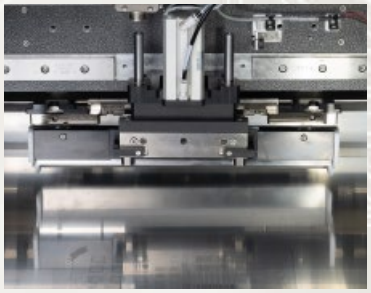


Quick change paste cartridge

Paste cartridges can be changed manually in just a few seconds by simply sliding into position.

Quick release squeegee

Quick release squeegee blades makes changing blades quick and easy with no tools required. It takes less than 30 seconds to change the blade.

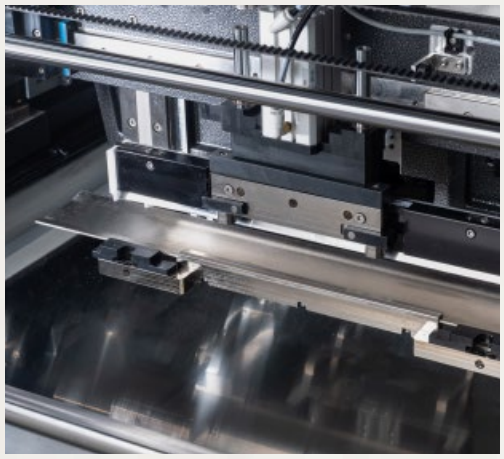


Paste contamination prevention

Paste contamination due to paste dripping onto various parts of the printer is a common industry challenge that causes maintenance, process disruption, and quality issues.

Edison II ACT is designed to solve this challenge:

1. **Squeegee shield** – tray mounted underneath the squeegees automatically extends to catch and hold the dripped paste to prevent it from dripping onto printer internal parts.
2. **Paste dispenser tray** – catch and hold possible paste drip from paste cartridge while dispenser is in parked position.
3. **Paste cartridge drip tray on carousel** – catch and hold any paste that drips from paste cartridge while sitting in the carousel
4. **Separated printing zone and wipe zone** – unique wipe operation designed to separate the print zone from the wipe zone to prevent the contaminants from falling into printer during wiping operation.



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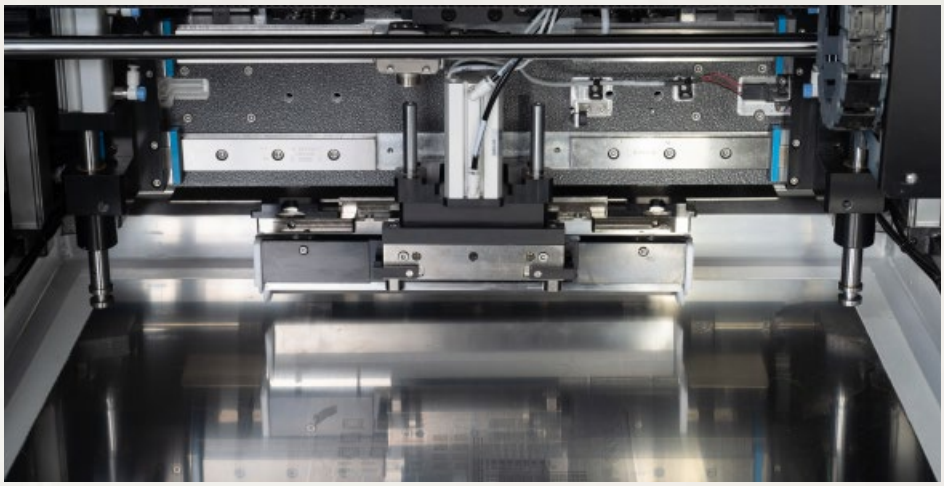
Edison II ACT

In addition to automated changeover technology that is available in progressive stages, Edison II ACT also provides a scalable set of software, controls, and technology enhancements to suit the performance requirements of Semiconductor, Automotive, and Smart Device manufacturing markets. Edison II ACT is built to excel in every way, with patented features throughout its design.

Edison II ACT Delivers Exceptional Performance

- **Fast: Best-in-class throughput**
- **Accurate: 25% improvement in wet print accuracy over current leading machines**
- **Fine Pitch Capable: Proven print process capability greater than 2 Cpk for 0201 metric components**

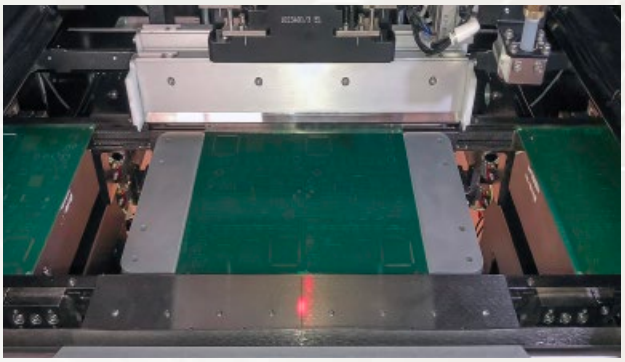


Advanced Closed-loop Print Head

MPM Edison II ACT is optimized for ultra-fine pitch printing with paste transfer efficiency that exceeds requirements for the smallest apertures. A single high precision load-cell with closed-loop pressure control and motor driven system enables precise and consistent squeegee force control across the entire print stroke in both directions, which helps improve yields especially for challenging thin substrate and stencil printing applications.

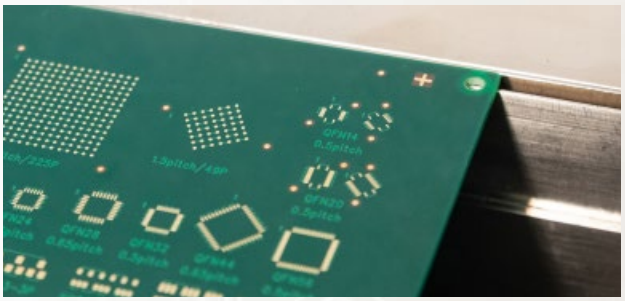
Board Staging

Ability to have three boards in the machine simultaneously, reduced distance on input conveyor by pre-loading the board during the print process results in reduced transfer times and improved cycle time.

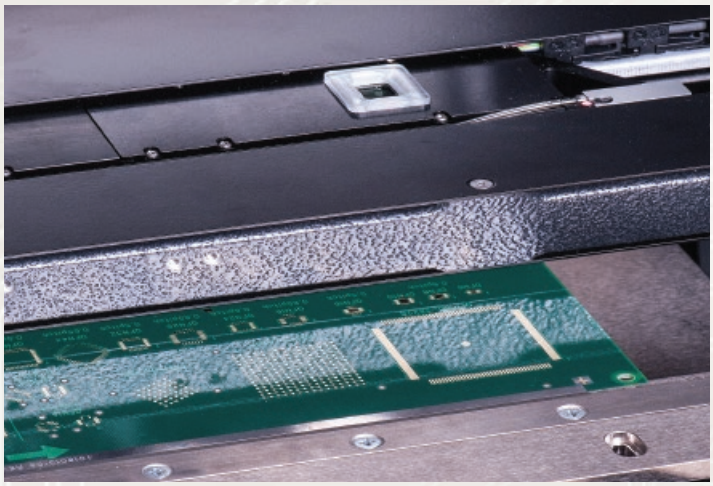


EdgeLoc Precision Board Clamping

The EdgeLoc system uses a side snugging technique that removes the need for top clamps which interfere with the PCB to stencil contact. The result is optimal gasketing and more volumetrically consistent edge-to-edge prints. With EdgeLoc II, robust flippers engage to secure the board across the top edge ensuring board flatness then move out of the way once the board is firmly gripped from the side. EdgeLoc+ board clamping can change between edge and top clamping simply through software.



Enhanced Technology for Optimum Performance

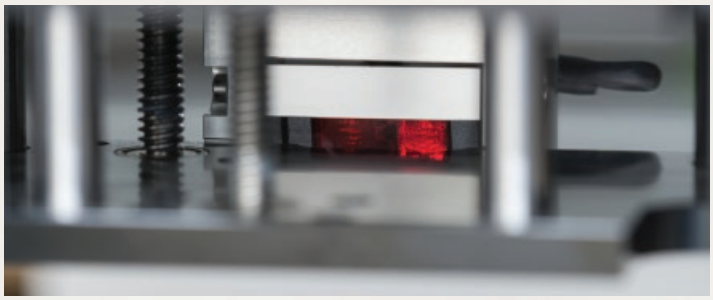


High Speed Vision Alignment with Ultra-slim Camera

Overall gantry thickness is only 44.3 mm featuring 'on the fly' 'POE' (Power Over Ethernet) camera; A single CCD split field provides precision simultaneous up-down image acquisition; FOV 8.6 x 8.6 mm.

Paste Height Monitor

The Paste Height Monitor is designed to prevent defects caused by inadequate volumes of paste on the stencil. It combines advanced software and sensor technology to accurately monitor the paste bead for volume consistency. Upper and lower limit roll-height monitoring eliminates insufficient or excess paste volumes. It is a non-contact solution that can automatically add more paste to the stencil as it is needed.



Back To Back (BTB) Configurable

BTB is a flexible dual lane solution without adding line length; identical single-lane printers are easily re-deployed to other lines when needed. Use in BTB configuration, or singly as a stand-alone.

Key Values of Edison II ACT

Adaptive changeover solution

- Easy to adopt, simple to use
- Cost effective - attractive ROI for end users

Scalable solution with tiered offerings

- Baseline machine upgradeable for future automation
- Multiple choices for changeover scope

Baseline machine exceptional features

- Super-size 65m paper roll typically lasts multiple shifts
- The most accurate printer in the market
- ±8 micron alignment, and ±15 micron wet print repeatability (≥2 Cpk @ 6 sigma)
- 15 second total cycle time
- Optimal coplanarity: Innovative machine design achieves ultra tight coplanarity between stencil and substrate
- Consistency: real-time closed-loop squeegee-force control
- Highly effective stencil wiping: Patented paper tension control
- Contamination free: Separate wiping and printing zone prevents cross contamination
- High yield on SEMI thin substrate: Venturi adjustable vacuum system
- Consistent printing quality and stencil protection: Large, flat blade-landing zone
- Adaptable down to18-inch stencil: Adjustable stencil shelf and adapter
- Small footprint: Compact design
- Industry 4.0 connectivity: OpenApps 4.0 for customizable MES communication interface

MPM Edison II ACT Printer Specifications

BOARD HANDLING	
Maximum Board Size (X x Y)	450 mm x 350 mm (17.72" x 13.78")
When using ACT dual-tray	*450mm x 250mm (17.72" x 9.84")*
Minimum Board Size (X x Y)	50 mm x 50 mm (1.97" x 1.97")
Board Thickness	
Foil Clamps	0.2 mm to 6.0 mm (0.007" to 0.236")
EdgeLoc	0.8 mm to 6.0 mm (0.031" to 0.236")
Maximum Board Weight	4.5 kg (10 lbs)
Board Edge Clearance	3.0 mm (0.118")
Underside Clearance	12.7 mm (0.5") standard Configurable for 25.4 mm (1.0")
Board Hold-Down	EdgeLoc II, centernest vacuum, Optional EdgeLoc+
Board Support Methods	Magnetic pins and blocks

PRINT PARAMETERS	
Maximum Print Area (X x Y)	450 mm x 350 mm (17.72 x 13.78")
Print Gap (Snap-off)	0 mm to 6.35 mm (0" to 0.25")
Print Speed	305 mm/sec (12.0"/sec)
Print Force	0 to 20 kg (0 lb to 44 lbs)
Stencil Frame Size	Adjustable Stencil Shelves is standard 584.2 mm x 584.2 mm (23" x 23") to 737 mm x 737 mm (29" x 29") Adapters available for smaller sizes

VISION	
Vision Field-of-View (FOV)	9.0 mm x 6.0 mm (0.354" x 0.236")
Fiducial Types	Standard shape fiducials (see SMEMA standards), pad/aperture
Camera System	Single digital camera - patented split optics vision

PERFORMANCE	
Total System Alignment Accuracy and Repeatability	±8 microns (±0.0003") at 6 sigma, Cpk ≥2.0*
Qualification is performed using production environment process variables; print speed, table lift and camera movement are included in the capability figure.	
Wet Print Deposit Accuracy and Repeatability	±15 microns (±0.0006") at 6 sigma, Cpk ≥2.0*
Based upon actual wet printing with positional accuracy and repeatability verified by a 3rd party measurement system.	
Cycle Time	
300	15 seconds including print and wipe
200	20 seconds including print and wipe
Based upon specific set of printing parameters, board size 5"x8".	

FACILITIES	
Power Requirements	200 to 240 VAC (±10%) single phase @ 50/60Hz, 15A
Air Supply Requirements	90 psi at 4 cfm (standard run mode) to 18 cfm (vacuum wipe) (6.20 bar @ 1.9 L/s to 8.5 L/s), 12.7 mm (0.5") diameter line
Height (excluding light tower)	1589 mm (62.55") at 940 mm (37.0") transport height
Machine Depth	1440 mm (56.70")
Machine Width	1280 mm (50.40")
Minimum Front Clearance	508 mm (20.0")
Minimum Rear Clearance	508 mm (20.0")
BTB Configuration	10 mm (0.39")
Machine Weight	
Crated	995 kg (2194 lbs)
Uncrated	806 kg (1777 lbs)
Weights may vary depending on the Edison model.	

* The higher the Cpk, the lower the variability with respect to the process specification limits. In a process qualified as a 6 sigma process (i.e., one that allows plus or minus 6 standard deviations within the specification limits), the Cpk is greater than or equal to 2.0.

Specification is subject to change without notice. Please consult factory for specifics.

ITW EAE maintains an ongoing program of product improvement that may affect design and/or price. We reserve the right to make these changes without prior notice or liability.

MPM Printers – Built on a Solid Foundation.

Strength and stability are prerequisites for accuracy and precision when system parts are in motion and moving about at high speed. Major assemblies are driven by precision ball screws, not belts, which eliminate the need for calibrations. The worknest and camera gantry are designed for optimum motion stability, shorter settling time, and faster board and stencil alignment. MPM® Edison's rigid frame is welded for low vibrations. This allows for higher repeatability and great reliability over time. Alignment is achieved with minimum motion; thus the PCB travels to the stencil more quickly.

ITW EAE is a division of Illinois Tool Works, Inc. It is a consolidation of all of its Electronic Assembly Equipment and Thermal Processing Technology. The group includes world-class products from MPM, Camalot, Electrovert, Vitronics Soltec and Despatch.

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