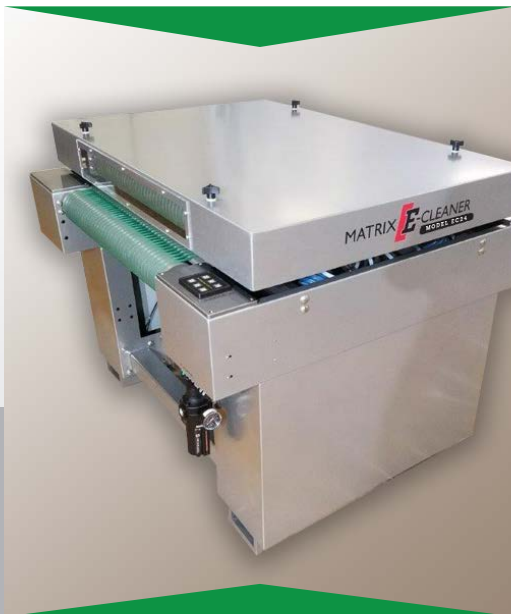


# Next Generation Digital Automation Solutions for PCB Fabrication

## A Guide for Equipment Options



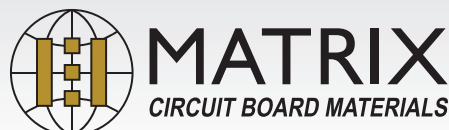
Electrostatic  
Panel  
Cleaning



New Generation  
Dry Film  
Laminator



Panel Handling  
Automation



Sales • Installation • Training • Service

# *“Has the North American PCB Industry Reached the Next Level?”*

The miniaturization of PCB Electronics, now characterized by sub 5 mil features and overall tight mechanical tolerances, is making it more and more challenging to build today's circuit boards using traditional manual methods. Companies are striving to optimize yields with increasingly higher layer counts, thinner substrates and almost-no-profile copper foils.

## **Automation has now become necessary.**

Matrix has recently assembled an equipment offering to provide companies with both entry level and highly sophisticated custom automation solutions. The introduction of new digital equipment now provides the fabricator with capabilities that have been unattainable since the inception of PCB fabrication. The benefits are substantial, highlighted by lower costs and increased yields.

As an example, experience is showing that floor space for the “front-end” process alone (dry film lamination & imaging) is being reduced by over 60% from previous operations.

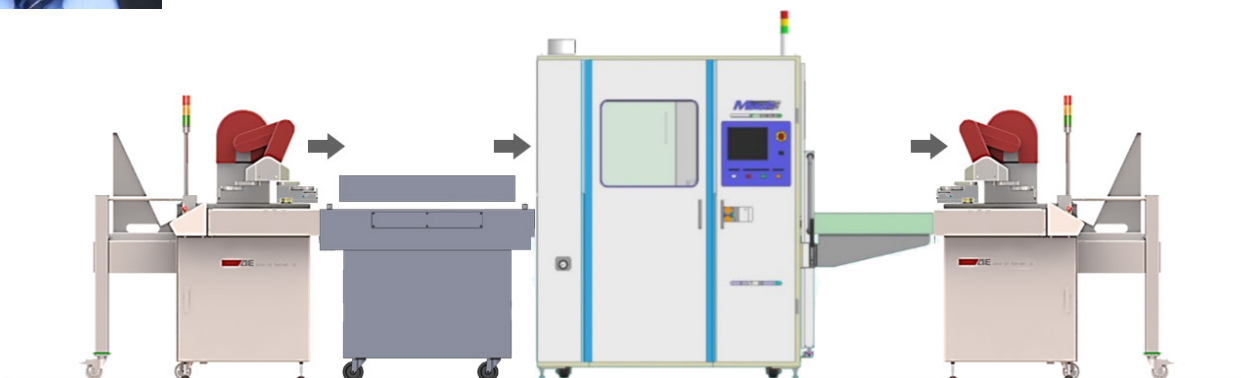
Matrix is now adding a focus not only on these new equipment additions, but also on supporting their installation, training, warranty, and after-warranty services. Automation is NOW required to improve quality, improve yields and guarantee consistency.

## **Increased Accuracy and Repeatability • Reduced Production Time • Lower Costs • Improved Quality • Higher Volume Production • Less Human Error**



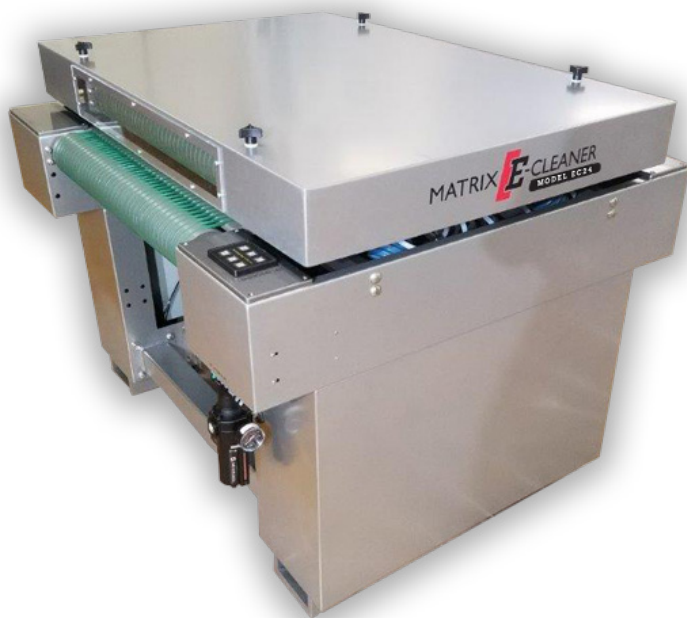
Fred Long is currently the Business Development Manager for Matrix USA Inc., and has 30+ years experience in the Electronic Interconnect markets. He has managed Sales and Marketing for the Company in the past, and is now focused on developing Automation Solutions for the North American PCB Industry.

Fred can be contacted via phone at (800) 668-5447 or email: [fred@matricelectronics.com](mailto:fred@matricelectronics.com)



# Electrostatic Surface Panel Cleaning

## MATRIX **E**-CLEANER MODEL EC24



### The Most Versatile and Cost-Effective Panel Cleaner

Cleanliness plays a significant role in PCB manufacturing success. Due to the continuing miniaturization of circuit features, it is now essential that dust, dirt, and human touch be eliminated from the process.

Matrix is introducing the latest Panel Cleaning device for the removal of loose surface debris using "NO-Touch" Electrostatic Neutralizers and High Pressure Air Knives... including options for vacuum particle removal.

#### Features

- No consumables
- Robust design to last > 15-20 years
- Electrostatic Touchless Cleaning
- Consistent cleaning on every panel
- Panel Thickness: 0.001" to 0.500"
- Minimal Maintenance
- Self Installation
- Options for particle removal

#### Applications

- Copper Layers and Panels before Dry Film
- Dry Film before Exposure or Direct Imaging
- Panels before and after Solder Mask
- Thin Films: PTFE, Foils, Pyralux, Flex
- Before AOI
- Prepreg before Packaging or Layup
- Copper Panels before Packaging or Layup
- Panels after Drilling/Deburring (removal of loose debris only)
- Finished Printed Circuit Boards before packaging

#### Dust Vacuum Collection Options

- Connect to In-House
- Connect to Stand-alone



#### Specifications

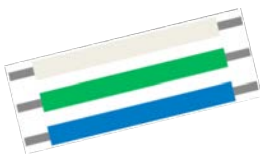
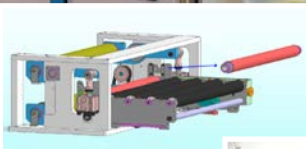
Cleaning Components	8 Banks of Air Jets (4 top, 4 bottom)
	4 Static Neutralizer Bars
	4 Vacuum Dust Collection Hoods
Conveyor Speed	1-100 FPM
Panel Widths	24", 30", Custom
Dimensions (EC24)	Operating Length: 42.5", Width: 49.5"
	Cleaning Width: 25.5"
	Conveyor Height: 34 - 41"
Power	120V, 60 Hz
Air	9.3 CFM @ 40 psi
Particle Removal	10-40 microns, depending on surface material
Vacuum Requirement	1300 CFM @ 6" W.G.

# The Latest Innovation in Dry Film Lami

The First EVEN Pressure and EVEN Heat Film Laminator with



Mach 630NP	24" wide
Mach 810NP	30" wide



## Standard Features

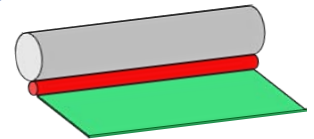
### Lamination Rolls (NO Hot Rolls)

The NP Series Laminators are supplied with 4 standard EPDM (Acid Resistant) rolls which can be removed and replaced in seconds.

Engineers can now use many combinations of rubber styles for various applications: thickness, durometer and rubber length.

### EVEN Pressure and EVEN Heat (essential for the transfer of sub 5 mil features)

The new design eliminates traditional roll bending ensuring even heat and pressure across the entire surface of the panel.



### Easy Operation and Maintenance

The operation of the film lamination process is now greatly simplified with the ability to load film from either side of the loading bay plus the ease of input from the updated PLC.

### Enclosed Cabinet Design

While in operation, the cabinet can be closed to minimize contaminants from settling on the copper panel surface prior to film lamination.

### Stationary Film Loading Bay

In many previous film laminators, the film loading bay moved away on wheels from the main cabinet to provide loading access from the front and back. The NP design now houses a fixed and stationary film loading bay which reduces mechanical wear and distortions that can cause potential film wrinkling.

### ECO Collapsible Mylar Take-up Roll

Easy removal of the dry film mylar coating.

### Programmable Logic Controller

Recipe, Input and Display of up to 100 operating parameters.

## Options

### Cassette Loading of Dry Film

Increased productivity with the ability to load different film thicknesses and widths when required.

### Ultra thin Transport

Down to 0.0016" thickness

### Exit Temp Indicator

Monitor device

### Dry Film Usage and End Warning

Ultra sonic sensors detect DF thickness and send a warning signal.





# mination (The New Industry Standard)

with "Quick Change" Rubber Rolls for Every Application

## Laminator Features and Options

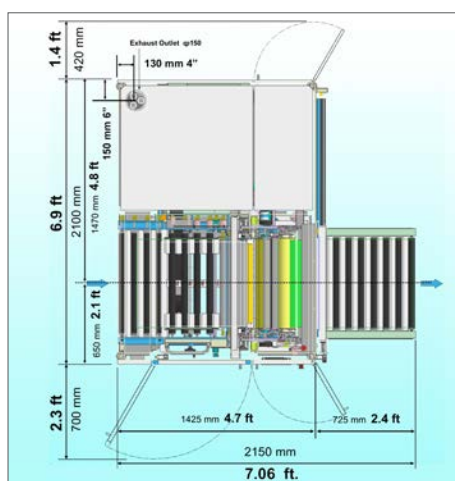
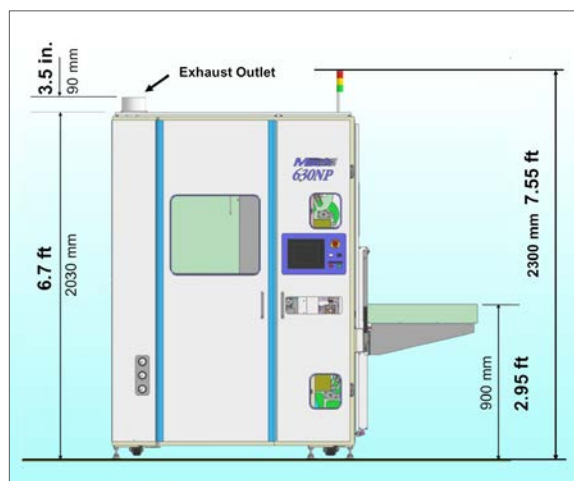
	630NP (24") / 810NP (30")	6630NP (24") / 8810NP (30")
Easy Lamination Roll Exchange	●	●
Easy Maintenance	●	●
EVEN Pressure Uniformity Module	●	●
EVEN Temperature Uniformity Module	●	●
Full Enclosure for Clean Operation	●	●
Touch Screen PLC Control	●	●
ECO Take-up Roll for Easy Mylar Removal	●	●
Cassette Film Loading System	○	●
Exit Panel Temperature Monitoring	○	●
Dry Film Usage and End Warning Indicators	○	●
Thin Core Option	○	○
Thick Core Option	○	○

● Standard Feature    ○ Optional Feature

## Specifications

Lamination	Laminating Roll	1.6" (50mm) dia. rubber - various coatings and durometers
	Roll Pressure	Max. 500 Kg/cm <sup>2</sup> (7112 psi)
DF Cutter	Non-Contaminating Disc	2.5" diameter (64mm)
Anti Contamination	DF Anti-Static Bar	Eliminates charge that attracts dust and contaminants
	Enclosure	Forced circulation with HEPA filter (Option)
Panel Dimensions	Size (Width)	Min. 9.8" (250mm) Max. 25.2" (640mm)
	Thickness (incl. copper foil)	<b>Standard:</b> 0.0040" to 0.236" (0.06mm to 6.0mm) <b>Thin Core Option:</b> down to 0.0016" (0.04mm) <b>Thick Core Option:</b> up to 0.315" (8.0mm)
Conveyor	Width	27.2" (690mm)
	Speed	3.28 to 18.0 ft/min. (1.0 to 5.5 m/min.)
Dry Film	Width	9.85" to 24.8" (250mm to 630mm)
	DF Roll Diameter	6" Core Diameter: Max. Film Diameter 9.85" (250mm) 3" Core Diameter: Max. Film Diameter 11.0" (280mm)
	Bobbin Diameter	3" or 6"
Film Placement	Front and Back Accuracy	+/- 0.02" (0.5mm)
	Side to Side Accuracy	+/- 0.02" (0.5mm)

## Dimensions (L to R)



## Utilities

### Power

3 Phase 220/200V  
50/60Hz, 10kW

### Air

0.5MPa, 100L/min  
ISO Rc 1/4 inch

### Exhaust

9.5m<sup>3</sup>/min φ 150mm

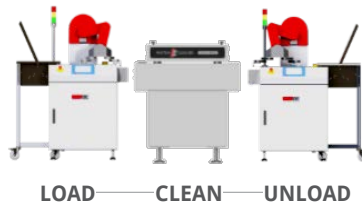
# Panel Handling Automation

Design your  
**AUTOMATION**  
process

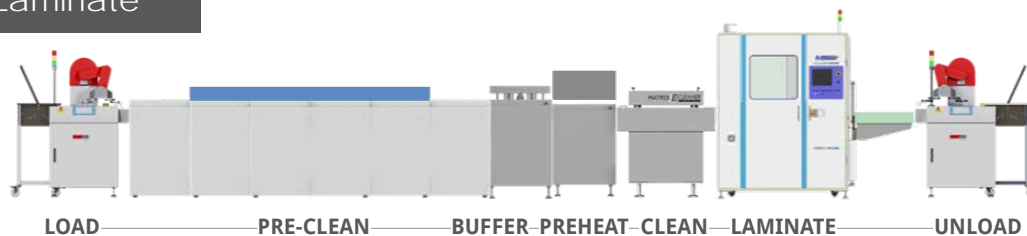


***"NO Touch Handling"***

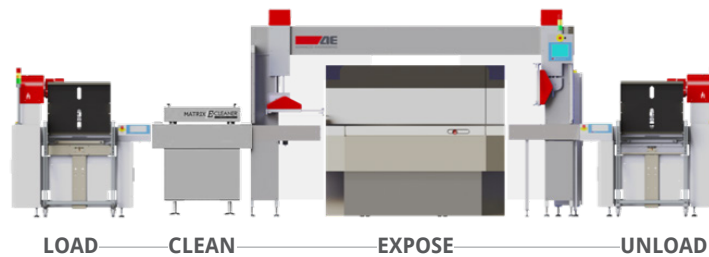
## Panel Clean



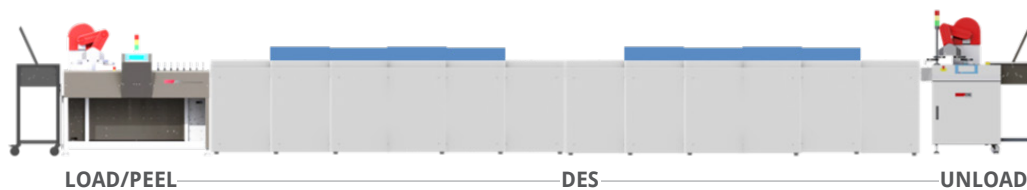
## Pre-clean & Laminate



## Clean & Expose



## Peel & DES



## Pre-clean, Laminate & Expose



# Panel Handling Automation

Modularity, Simple Operation, Compact Footprint, Flexibility, Low Energy Consumption

## Servant

### Robot Loader/Unloader

Flexible and Universal handling concept for several applications

Floor Dimensions: **3' x 4' (LxW)**

Minimal Thickness: **50µ**

Throughput: **12 pickups/min**

- Suitable for L-Rack and Flat Rack
- All functions integrated in one system
- Automatic multi format gripper, 360° turntable
- Double sheet detection and separation on hand
- Interleaf sheet handling
- Automatic format recognition
- Height adjustable to Trolley & Conveyors
- No moving parts above the panel
- Very low power consumption



## SAP 650R/650

### Very compact Automatic Mylar Sheet Remover

Available as a compact inline solution or with the optional Robot Loader

Floor Dimensions: **5.5' x 4.3' (LxW)**

Minimal Thickness: **50µ**

Throughput: **8 panels/min**

- High productivity up to 8 panels/min
- Re-peel function reduces failure rate
- Mylar storage in a box underneath
- 3 stage buffer integrated
- Suitable for 0.002" rigid material
- Mylar tear detection
- Typical failure rate is less than 2 per 1000 panels
- Very low power consumption
- Recipe function



## PM01v4 Peelmaster

### World's most successful Automatic Mylar Sheet Remover

Compact, durable and fully automated. The advanced and unique peeling method guarantees a soft and gentle operation.

Floor Dimensions: **5.5' x 6.0' (LxW)**

Minimal Thickness: **30µ**

Throughput: **12 panels/min**

- Highest productivity up to 12 panels/min
- Re-peel function reduces failure rate
- Self core Mylar removal reduces waste volume
- 6-stage buffer integrated
- Suitable for 0,030 mm material
- Mylar tear detection
- DES throughput optimization
- Typical failure rate is less than 2 per 1000 panels
- Very low power consumption ~ 1,2 kW



## Buddy 650

### Robot Loader/Unloader

Loading, Unloading, Failure board store interleaving, overflow, buffer

Floor Dimensions: **3' x 4' (LxW)**

Minimal Thickness: **50µ**

Throughput: **12 pickups/min**

- Multi format gripper
- Integrated center device
- AE Vacuum system for heavy boards
- Automatic synchronization to other machines
- Double sheet detection and separation
- Interleaf sheet handling
- Automatic format recognition
- No moving parts above the panel
- Minimal floor space required
- Very low power consumption ~ 0,3 kW



## Buffer Systems

### A wide range available

Different styles available, eg: Buffer, corner station, conveyors, etc.

Floor Dimensions: **3' x 4' (LxW)**

Minimal Thickness: **50µ**

Throughput: **6 panels/min**

- Buffer systems with a storage capacity up to 30 panels
- Multifunctional FIFO or LIFO application
- Optional unloading positions for failure panels or overflow panels
- Pre-determined hold time for each panel
- Cleanroom suitable
- Up to 6 panels/min



## Options

### Conveyors, Carts and more



**Detailed Specifications  
on all equipment  
are available**

# Panel Handling Automation



## CDTA 650

### Standalone Compact Desktop Automation

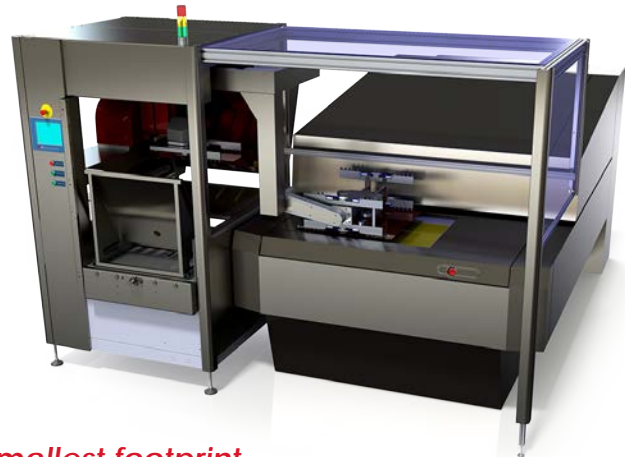
Very compact robot system for loading and unloading of LDI exposures in an all-in-one solution system with integrated cleaner and flip station

Dimensions: **3.9' x 3.9' x 7.5' (LxWxH)**

Minimal Thickness: **50μ**

Throughput: **3 sides/min**

- Two 4-axis robots for pick and place on table
- AAA/BBB mode for reverse workflow
- Cycle time down to 20 sec/side
- Double sheet detection and separation on hand
- Multi batch mode
- Cleanroom suitable
- Unlimited access to system table and system maintenance
- Low Power consumption - 1.2 KW



*Smallest footprint*

## EDTA 650SA

### Standalone External Desktop Automation

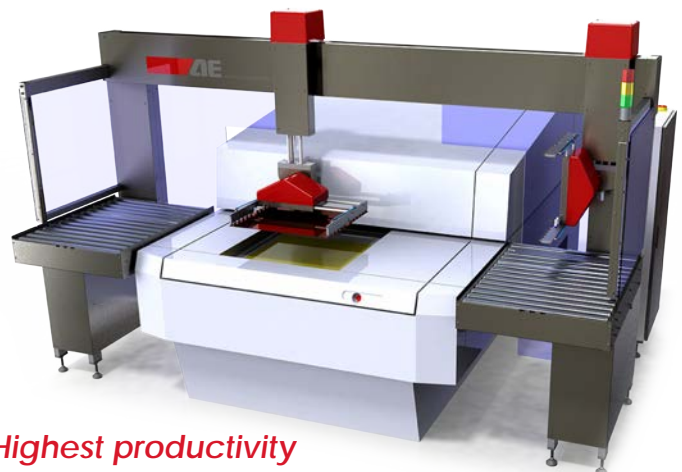
Multi robot system for loading and unloading of desktop units like LDI, AOI, INKJET, etc.

Dimensions: **Various layouts available**

Minimal Thickness: **30μ**

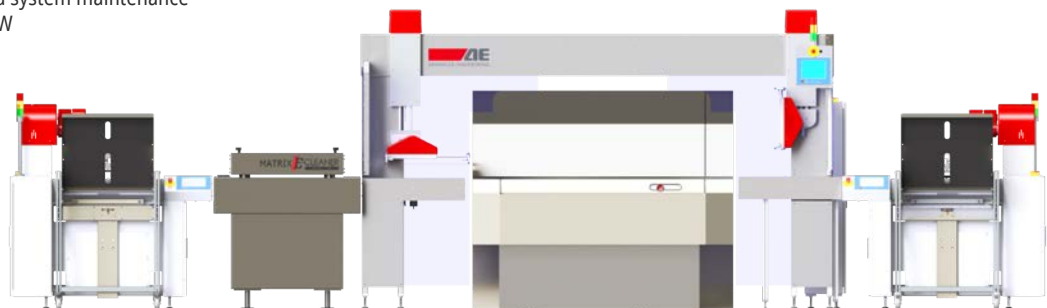
Throughput: **6 sides/min**

- Two 3-axis robots for pick and place on table
- Supported by two 4-axis robots for loading and unloading
- A/B mode for one pass through
- Cycle Time down to 10 sec/side
- Flipping board integrated
- Automatic multi format gripper
- Multi-Batch and Multi-Format handling
- Cleanroom suitable
- Unlimited access to system table and system maintenance
- Very low power consumption - 1.2 KW



*Highest productivity*

*Available as an  
Inline Solution*



Supplier to the North American  
Circuit Board Industry since 1977

**TORONTO**  
1124 Mid-Way Boulevard,  
Mississauga, ON L5T 2C1  
Phone (905) 670-8400  
Fax (905) 670-8420

**Toll-free 1-800-668-5447**

**SANTA ANA**  
2730 S. Main Street,  
Santa Ana, CA 92707  
Phone (714) 825-0404  
Fax (714) 825-0406

**SANTA CLARA**  
3261 Edward Avenue,  
Santa Clara, CA 95054  
Phone (408) 477-2963  
Fax (408) 564-7047

**CHICAGO**  
770 Creel Drive,  
Wood Dale, IL 60191  
Phone (630) 475-8753

Visit us on the web at [www.matrixusa.us](http://www.matrixusa.us)