



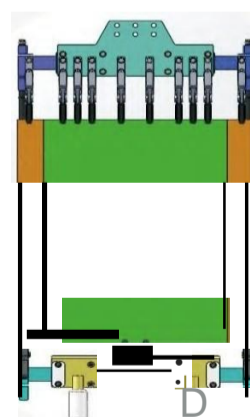
UNIVERSAL PCB EQUIPMENT CO LTD



Insulectro - A Distributor of Equipment Technologies



# Non-contacting Automatic Precision Vertical Continuous Plating Machine



Contactless rack, customized design. Through fixing the top and bottom of the panel, it can ensure the panel's flatness and that no side movement happened in copper tank.



Contactless and no guide strip to avoid the problem of chemical mark made by guide strip and scratching.

## Capability

<b>Panel Size(FPC):</b>	Panel Length 350mm~500mm Panel Depth 500mm 0.012mm(core)+12/12µm Cu~1.2mm
<b>Throwing Power:</b>	Through Hole <P0.1mm, TP>150% Blind Hole <P0.05mm, AR= 1:1, TP>90% Blind Hole <P0.05mm, AR= 1:1 Filling Hole Rate>95%
<b>Filling Power:</b>	
<b>Plating Uniformity:</b>	Standard Deviation/ (Average Value) Absolute Deviation< +10% R<2.5µm(Iffii[o]Cu = 12µm)
<b>Panel Size (Rigid Board):</b>	Panel Length 508mm~725mm Panel Depth 610mm~622mm 0.1mm(core)+12/12µm Cu~3.2mm
<b>Throwing Power:</b>	Through Hole<0.2mm~0.25mm, AR=8:1, TP>90% Through Hole ct>0.2mm~0.25mm, AR=10:1, TP>85% Blind Hole <P0.1mm, AR= 1:1, TP>90%
<b>Filling Power :</b>	Blind Hole <P0.075mm~0.1 mm, AR=1:1 Filling Hole Rate>95% Blind Hole <P0.12mm~0.15mm, AR=1:1 Filling Hole Rate>90%
<b>Plating Uniformity:</b>	COV<5%({ -0im Standard Deviation/ {Average Value) Absolute Deviation< +9% R <4.5µm(Iffii[o]Cu = 25 µ m)

Specification and capability are subject to contract, and machine should work with proper chemicals and current density

### Application:

First plating, Full panel plating, Pattern plating, VIA Fill plating, Half VIA plating

### Design Feature

- \* Ensure panels flatness and reduce edge effect.
- Distance between spray and panel surface is consistent, direct flow onto panel
- Achieve handling super thin panel, great spray-rate effect, satisfy the highly difficult hole-filling product request.
- No obstruction, no guide strip, no scratch, easier repair and maintenance.

## Pulse-electroplating Vertical Continuous Plating Machine



### Capability

<b>Panel Size (Rigid Board):</b>	622mmW x 635mmL(max) (Standard) 622mmW x 735mm L(max)(t.JO;* & Lengthened) 355mmW x 406mmL(m in) 0.3~4.0mm
<b>Throwing Power:</b>	Through Hole <P0.2mm~0.25mm, AR=10:1, TP>100% Through Hole <P0.2mm~0.25mm, AR=16:1, TP>95%
<b>Plating Uniformity:</b>	COV < 5% (Standard Deviation Size) (Average Value) Absolute Deviation < + 10% R < 5μm (iCu = 25μm)

Specification and capability are subject to contract, and machine should work with proper chemicals and current density

Application: Full panel plating, Pattern plating(Copper Plating)

### The advantage of Pulse-electroplating Line-high depth plating ability

Power supply type	Panel thickness	Hole diameter	Aspect ratio	Current Density	Thickness of copper plating	Single point TP value	Six-point TP value
Pulse	3.2mm	0.2mm	16:1	30ASF	25μm	95%	97%



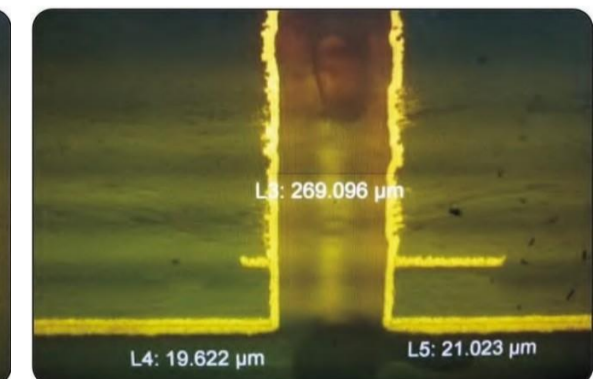
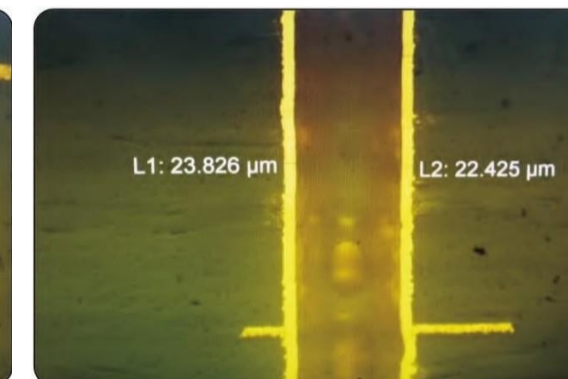
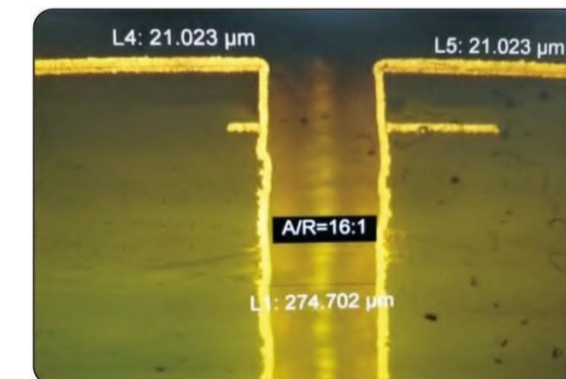
(Optional) self-inspective flight bar clamp current device



Automatic pumping device for copper plating residue



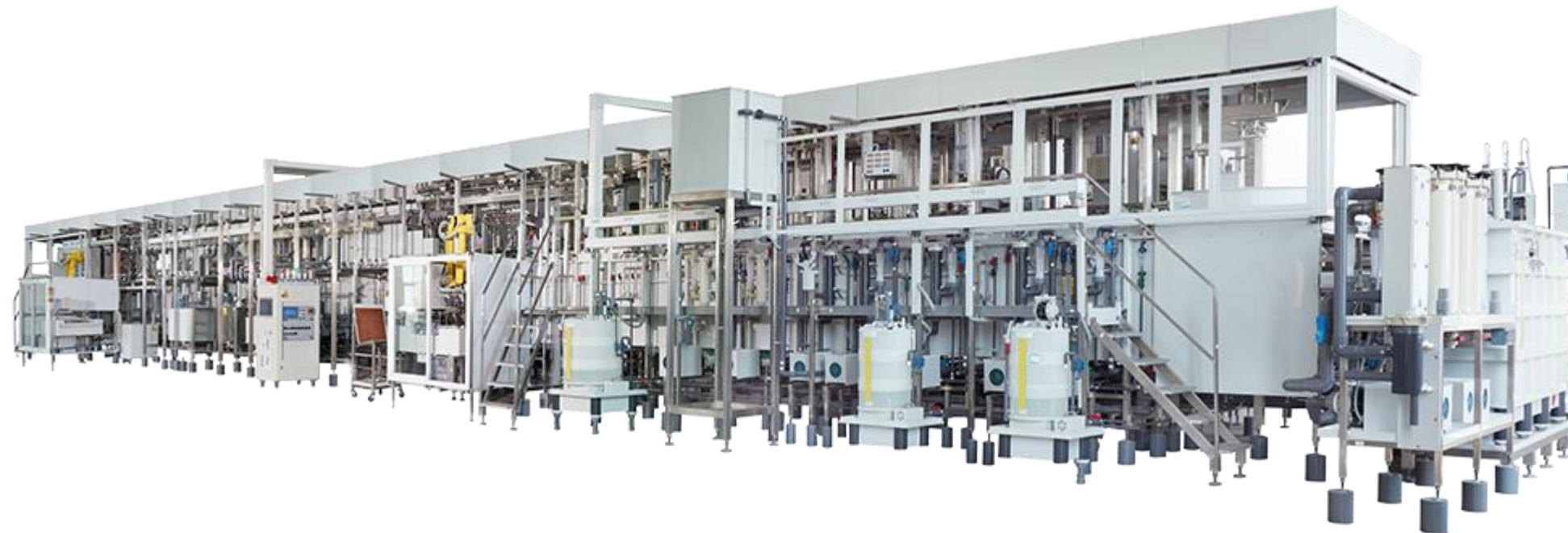
Copper tank is equipped with steel wire rope. Alarm starts when flight bar jiggles



## Vertical Continuous Copper Plating Machine



## U Type Vertical Continuous Plating Machine



## Capability

<b>Panel Size(FPC):</b>	500mmW x 500mmL(max) 250mmW x 250mm L(min) 0.012mm(core)+12/12µm Cu~1.2mm
<b>Throwing Power:</b>	Through Hole <P0.1mm, TP>150% Blind Hole <P0.05mm, AR= 1:1, TP>90%
<b>Filling Power:</b>	Blind Hole <P0.05mm, AR= 1:1 Filling Hole Rate>95%
<b>Plating Uniformity:</b>	COV <5% (1/σ Standard Deviation/ Average Value) Absolute Deviation < +10% R<2.5µm (Cu=12µm)
<b>Panel Size (Rigid Board):</b>	622 mmW x 635mm L(max)(standard) 622 mmW x 735mm L(max)(Heightened) 355 mmW x 406mmL(min) 0.1mm(core)+ 12/12µm Cu~3.2mm
<b>Throwing Power:</b>	Through Hole <P0.2 mm~ 0.25 mm, AR= 8:1, TP>90% Through Hole <P0.2 mm~ 0.25 mm, AR= 10:1, TP>85% Blind Hole <P0.1mm, AR= 1:1, TP>90%
<b>Filling Power :</b>	Blind Hole <P0.075mm ~0.1mm, AR= 1:1 Filling Hole Rate>95% Blind Hole <P0.12mm~ 0.15mm, AR= 1:1 Filling Hole Rate>90%
<b>Plating Uniformity:</b>	COV <5% (Standard Deviation/Average Value) Absolute Deviation < +10% R<5µm (Cu =25µm)

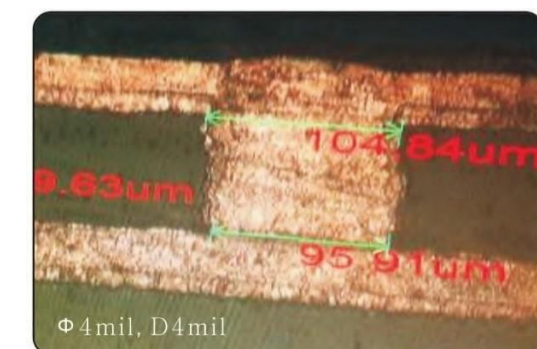
Specification and capability are subject to contract, and machine should work with proper chemicals and current density

### Application:

First plating, Full panel plating, Pattern plating, VIA Fill plating, Half VIA Fill plating

Fill-up rate >95%, working parameters are as below:

Flash Plating Tank's Current	Copper Plating Tank's Current	Speed (m/min)	Spray Flowrate (LPM)	Flash Plating Time (min)	Plating Time (min)	Flash Plating Thickness (µm)	Plating Thickness (µm)
18ASF	15ASF	0.35	300-350	9.25	60	3.4	19



# Integrated U Type Vertical Continuous Plating Machine

## Capability

<b>Panel Size (Rigid Board):</b>	622mmW x 635mm L(max) (Standard) 622mmW x 735mm L(max) (Heightened) 355mmW x 406mm L(min) 0.3~3.2mm
<b>Throwing Power:</b>	imJL Through Hole $\leq 0.2\text{mm} \sim 0.25\text{mm}$ , AR= 8:1, TP>90% imJL Through Hole $\leq 0.2\text{mm} \sim 0.25\text{mm}$ , AR= 10:1, TP>85%
<b>Plating Uniformity:</b>	COV $\leq 5\%$ (Standard Deviation / 3 * Average Value) t.l.s Absolute Deviation $\leq +10\%$ $R \leq 5\mu\text{m}$ (Cu = 25 $\mu\text{m}$ )



Specification and capability are subject to contract, and machine should work with proper chemicals and current density

Application: First plating, Full panel plating



Detection and alarm device for panel drop off

## VCP Recommended Reference

Plating Line				Technology			Rigid Panel Thickness		Flex Panel (FPC)	Anode Type		500mm deep FPC panel installation dimensions		635mm deep panel installation dimensions		730mm deep panel installation dimensions		
General classification	Medium classification	Rectifier	Cathode flight bar	Panel plating	Pattern plating	Hole filling	0.3-3.2mm	0.05-3.2mm	0.036-1.2mm	Soluble	insoluble	( m m ) Width	( m m ) Height	( m m ) Width	( m m ) Height	( m m ) Width	( m m ) Height	
Transfer-type VCP	Single-row Upper and Lower transfer-type VCP	DC	Top clamp	●	●	●	●	●	●	●	●	2950	3800	2950	4000	2950	4200	
		Pulse-electroplating		●	○	*	●	●	*	●	*	*	*	3650	4000	3650	4200	
		DC	Upper and lower clip frame	●	●	●	●	●	●	●	●	●	2950	4800	2950	5000	2950	5200
		Pulse-electroplating		●	○	*	●	●	*	●	*	*	*	3650	5000	3650	5200	
	Double-row Upper and Lower Transfer-type DVCP	Top clamp	DC	●	●	●	●	●	●	●	●	●	4350	3800	4350	4000	4350	4200
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	5500	4000	5500	4200	
		Upper and lower clip frame	DC	●	●	●	●	●	●	●	●	●	4350	4800	4350	5000	4350	5200
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	5500	5000	5500	5200	
	Single-row Li-transfer-type UVCP	Top clamp	DC	●	●	●	●	●	●	●	●	●	5120	3500	5120	3600	5120	3700
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	5120	3600	5120	3700	
		Upper and lower clip frame	DC	●	●	●	●	●	●	●	●	●	5120	3600	5120	3750	5120	3850
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	5120	3750	5120	3850	
	Double-row Li-transfer-type UDVCP	Top clamp	DC	●	●	●	●	●	●	●	●	●	7000	3500	7000	3600	7000	3700
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	7000	3600	7000	3700	
		Upper and lower clip frame	DC	●	●	●	●	●	●	●	●	●	7000	3600	7000	3750	7000	3850
			Pulse-electroplating	●	○	*	●	●	*	●	*	*	*	7000	3750	7000	3850	
Integrated-type EVCP	Integrated-type	DC	Top clamp	●	*	*	●	*	*	●	●	*	*	2350	3600	2350	3700	
		Pulse-electroplating		●	*	*	●	*	*	●	*	*	*	2350	3750	2350	3850	

● Applicable

\* Not applicable

○ Applicable for copper plating, not applicable for tin plating

1. No insoluble anode has been used in Pulse-electroplating

2. -Integrated type is not recommended for pattern plating nor hole filling process, and is not recommended for manufacturing thin panel

## DES Machine

### Hyper Etching

UCE is devoted to innovating cutting edge technology of PCB wet-processing equipment to meet the requirements of industry development.



### Capability

<b>Panel Size(FPC):</b>	500mmWx500mm L(max) 250mmWx250mm L(min) 0.025mm(core) +12/12µm Cu~1.2mm
<b>Panel Size (Rigid Board):</b>	630mmWx 630mmL(max) 355mmWx 355mmL(min) 0.025mm(core) +12/12µm Cu~3.2mm
<b>Panel Size (Back Panel):</b>	1050mmWx 1100mmL(max) 355mmWx 355mmL(min) 0.5~12mm

Specification and capability are subject to contract, and machine should work with proper chemicals.

### Hyper Etching Advantages

1. Suitable for fine line circuit
2. Suitable for thick copper etching
3. Enhance etching factor

**Collaboration with Vacuum Etching and Specialized Spray**  
Specialized Original

**L/5=30/30**  
12µm Cu, 10µm DFR  
DFR L/S=40/20  
After Etching----> 30/30  
E/F=S.0~6.0

**L/5=30/30**  
18µm Cu, 15µm DFR  
DFR L/S=40/20  
After Etching----> 30/30  
E/F=4.0~4.5

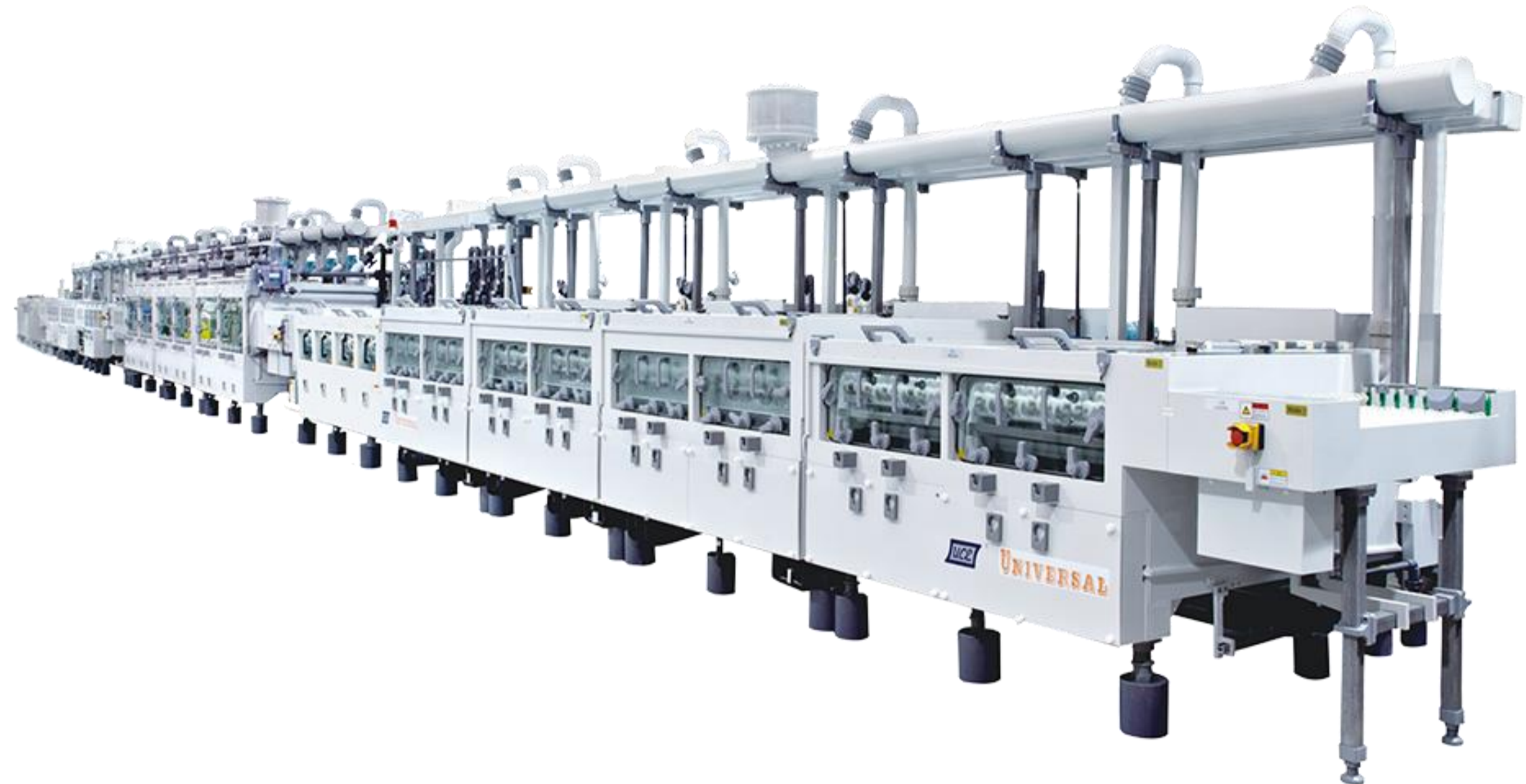
**Small Size Particle of Etching Chemicals and Vacuum Etching are More Easy to Enter Between DFR.**

## SES Machine

### Capability

Panel Size (Rigid Board):	630mmWx 630mml(max) 355mmWx 355mml(min) 0.3~3.2mm
Panel Size (Back Panel):	1050mmWx 1100mml(max) 355mmWx 355mml(min) 0.5~12mm

\* Specification and capability are subject to contract, and machine should work with proper chemicals.



### Design of Film Stripping Spiral Extraction (optional configuration - film stripping effect)

After the PCB/FPC Film Stripping, the water content of the film residue is high. Applying UCE filter design in the Film Stripping can effectively reduce the cost of film residue treatment.



The machine body utilizes Fire Retardant PP material, which is high-temperature resistant, fireproof and safe



Filter out 98% film residue



Reduce the film residue weight efficiently, cut down the cost of hazardous waste treatment



# Desmear & PTH Machine

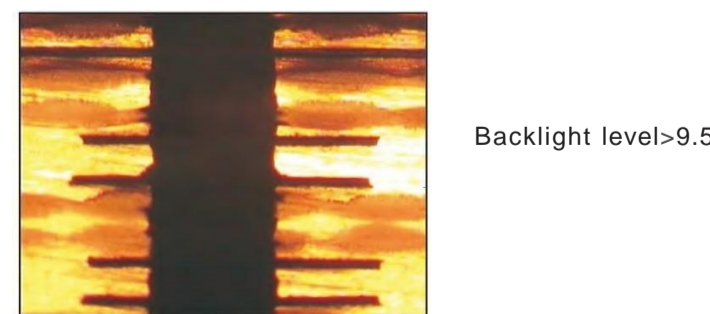
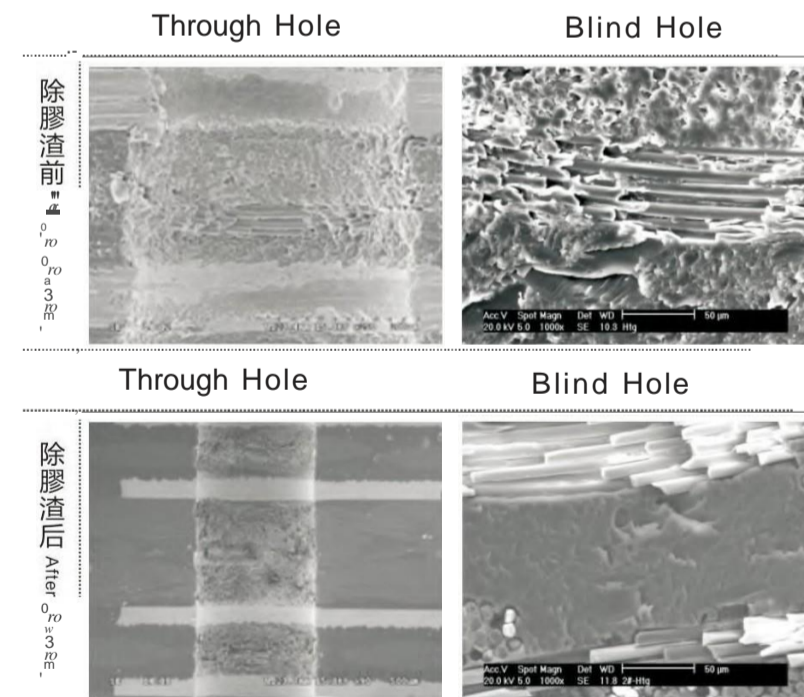


# Through-Hole Plating Machine (BH/SHADOW/ECLIPSE/DMSE)



## Capability

<b>Panel Size(FPC):</b>	500mmWx500mmL(max) 250mmWx250mmL(min) 0.012mm(core) + 12/12µm Cu~1.2mm
<b>Aspect Ratio:</b>	1: 1( IL/Blind Hole <math>\leq 0.05\text{mm}</math>) 12: 1(@IL/Through Hole <math>\leq 0.1\text{mm}</math>)
<b>Panel Size (Rigid Board):</b>	630mmWx 630mmL(max) 355mmWx 355mmL(min) 0.025mm(core) + 12/12µm Cu~3.2mm
<b>Aspect Ratio:</b>	1: 1( IL/Blind Hole <math>\leq 0.075\text{mm}</math>) 20: 1(@IL/Through Hole <math>\leq 0.2\text{mm}</math>)
<b>Panel Size (Back Panel):</b>	1050mmWx 1100mmL(max) 355mmWx 355mmL(min) 0.5~12mm
<b>Aspect Ratio:</b>	1: 1( IL/Blind Hole <math>\leq 0.1\text{mm}</math>) 20: 1(@IL/Through Hole <math>\leq 0.3\text{mm}</math>)

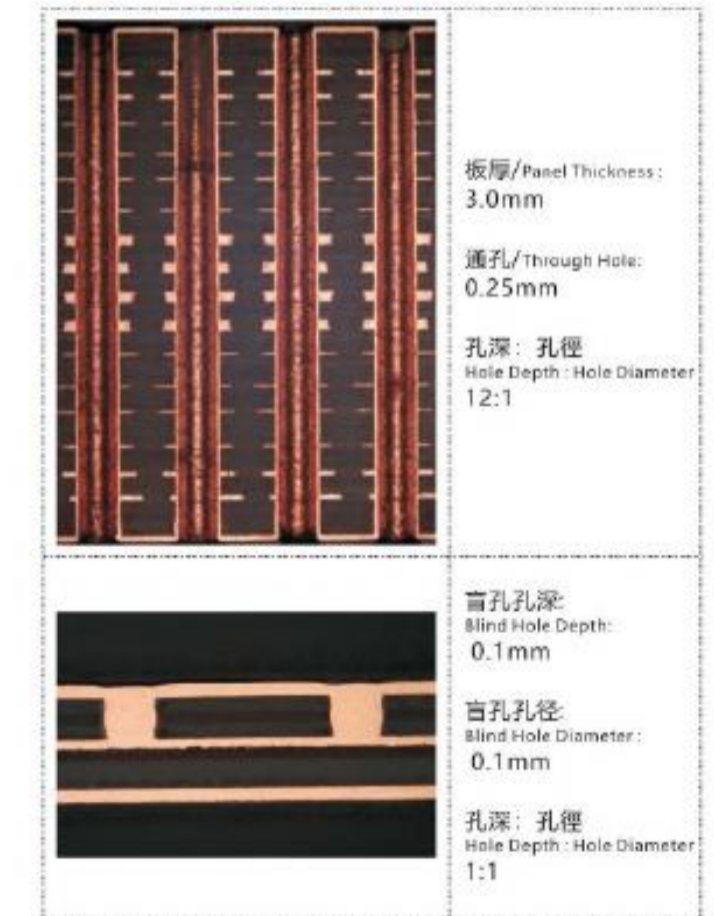


\* Specification and capability are subject to contract, and machine should work with proper chemicals.

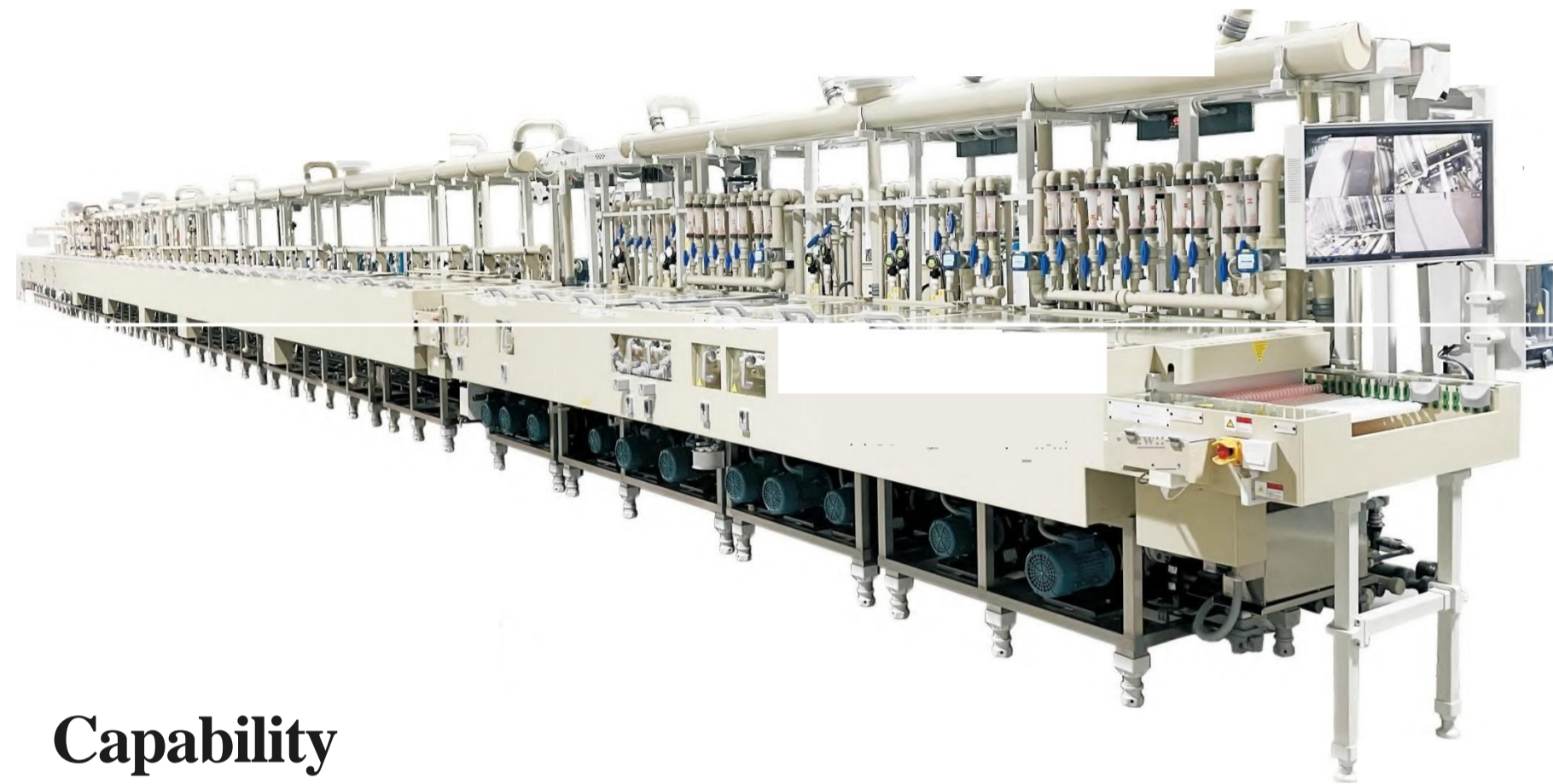
## Capability

<b>Panel Size(FPC):</b>	500mmWx500mmL(max) 250mmWx250mmL(min) 0.012mm(core) + 12/12µm Cu~1.2mm
<b>Aspect Ratio:</b>	1: 1( IL/Blind Hole <math>\leq 0.05\text{mm}</math>) 8: 1(@IL/Through Hole <math>\leq 0.15\text{mm}</math>)
<b>Panel Size (Rigid Board):</b>	630mmWx630mmL(max) 355mmWx 355mmL(min) 0.025mm(core) + 12/12µm Cu~3.2mm
<b>Aspect Ratio:</b>	1: 1( IL/Blind Hole <math>\leq 0.075\text{mm}</math>) 12: 1(@IL/Through Hole <math>\leq 0.2\text{mm}</math>)

\* Specification and capability are subject to contract, and machine should work with proper chemicals.



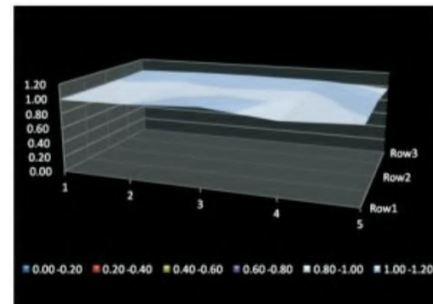
# Immersion Tin Machine



## Capability

<b>Panel Size (Rigid Board):</b>	630mmW x 630mmL(max) 100mmW x 125mmL(min) 0.3~3.2mm
<b>Aspect Ratio:</b>	1: 1C@:rL/Blind Hole CD0.1mm 12: 1(im:rL/Through Hole CD0.2mm)

Specification and capability are subject to contract, and machine should work with proper chemicals.



Excellent Tin layer uniformity



Blind hole fully covered by Tin layer

# Immersion Sliver Machine



## Capability

### Panel Size(Rigid Board):

630mmW x 630mmL(max)  
75mmW x 75mmL(min)  
0.3~3.2mm

### Aspect Ratio:

1 : 1( JL/Blind Hole  $\phi$ 0.1mm)  
12: 1(iffi=JL/Through Hole  $\phi$ 0.2mm)

Specification and capability are subject to contract, and machine should work with proper chemicals.

# OSP Machine

## Capability

### Panel Size(Rigid Board):

630mmW x 630mm L(max)  
50mmW x 50mmL(min)  
0.3~3.2mm

### Aspect Ratio:

1 : 1( JL/Blind Hole  $\phi$ 0.075mm)  
12: 1(iffi=i'L/Through Hole  $\phi$ 0.2mm)



## Jet Scrubbing Machine

### Capability

#### Panel Size(FPC):

500mmWx500mmL(max)  
250mmWx250mmL(min)  
0.05-1.6mm

#### Panel Size(Rigid Board):

630mmWx 630mmL(max)  
75mmWx75mmL(min)  
0.1-3.2mm

#### Panel Size(Back Panel):

1050mmWx 1100mmL(max)  
355mmWx 355mmL(min)  
0.5-12mm



## Precision Scrubbing Machine

### Capability

#### Panel Size(Rigid Board):

630mmWx 630mmL(max)  
355mmWx 355mmL(min)  
0.2-3.2mm

#### Panel Size(Back Panel):

1050mmWx 1100mmL(max)  
355mmWx 355mmL(min)  
0.5-10mm



## Pumice Scrubbing Machine

### Capability

#### Panel Size(Rigid Board):

630mmWx630mmL(max)  
355mmWx 355mmL(min)  
0.3-3.2mm

#### Panel Size(Back Panel):

1050mmWx 1100mmL(max)  
355mmWx 355mmL(min)  
0.5-12mm



## Middle/Super Roughening Machine

### Capability

#### Panel Size(FPC):

500mmWx500mmL(max)  
250mmWx250mmL(min)  
0.012mm(core) +12/12µm Cu~1.2mm

#### Panel Size(Rigid Board):

630mmWx630mmL(max)  
355mmWx 355mmL(min)  
0.025mm(core) +12/12µm Cu~3.2mm

#### Panel Size(Back Panel):

1050mmWx 1100mmL(max)  
355mmW x355mmL(min)  
0.5-12mm



# Oxide Replacement Machine

(Flat Bond/Bondfilm EX/Novabond EX)

## Capability

### Panel Size(FPC):

500mmWx500mmL(max)  
250mmWx250mmL(min)  
>0.05mm

### Panel Size(Rigid Board):

630mmWx630mmL(max)  
355mmWx 355mmL(min)  
0.025mm(core)+12/12µm Cu~2,4mm



# HASL Post-treatment Machine

## Capability

### Panel Size(Rigid Board):

630mmWx630mmL(max)  
SOmmWx SOmmL(min)  
0.3~3.2mm

### Aspect Ratio:

1 : 1 ( IL/Blind Hole <math>\leq 0.075\text{mm}</math>)  
16: 1 (@IL/Through Hole <math>\leq 0.2\text{mm}</math>)



# Developing Machine

## Capability

### Panel Size(FPC):

500mmWx500mmL(max)  
250mmWx250mmL(min)  
0.012mm(core)+12/12µm Cu~1.2mm

### Panel Size(Rigid Board):

630mmWx630mmL(max)  
355mmWx 355mmL(min)  
0.025mm(core)+12/12µm Cu~3.2mm

### Panel Size(Back Panel):

1050mmWx 1100mmL(max)  
355mmWx 355mmL(min)  
0.5~12mm



# Final Cleaning Machine

## Capability

### Panel Size(Rigid Board):

630mmWx630mmL(max)  
SOmmWx SOmmL(min)  
0.3~3.2mm

### Aspect Ratio:

1 : 1 ( IL/Blind Hole <math>\leq 0.075\text{mm}</math>)  
16: 1 (@IL/Through Hole <math>\leq 0.2\text{mm}</math>)



## 6 Axis Unloader/Loader

### Capability

**Dimensions:** 1600mmX1950mmX2050mm

**Working Height:** 1100+30mm

**Panel Size:** 63SX635mm(Max) / 3SSX355mm( Min)

**Panel Thickness:** 0.075~3.2mm

**Power Supply:** 1Ph 220V 50Hz 3.2kW

**Air Supply:** 0.6MPa



## L-rack Unloader/Loader

### Capability

**Dimensions:** 1700mmX1100mmX1470mm

**Working Height:** 1100+30mm

**Panel Size:** 63SX635mm(Max) / 3SSX355mm(Min)

**Panel Thickness:** 0.3~3.2mm

**Power Supply:** 1Ph 220V 50Hz 1.2kW

**Air Supply:** 0.6MPa



## Horizontal Paper Interleave Unloader/Loader

### Capability

**Dimensions:** 2350mmX1200mmX2150mm

**Working Height:** 1100+30mm

**Panel Size:** 63SX635mm(Max) / 3SSX355mm(Min)

**Panel Thickness:** 0.075~3.2mm

**Power Supply:** 1Ph 220V 50Hz 1.5kW / 3Ph 380V 50Hz 2.5kW

**Air Supply:** 0.6MPa

**Capacity:** 8Pcs/min



## Crawler Unloader/Loader

### Capability

**Dimensions:** 1725mmx930mmx1420mm

**Working Height:** 1100+30mm

**Panel Size:** 635X635mm (Max) / 355mmx355mm (Min)

**Panel Thickness:** 0.8~4.0mm

**Power Supply:** 1P.h 220V 50Hz 1.0kW

**Temporary Storage:** 50Pcs/100Pcs

**Capacity:** 10Pcs/min



## 4 Way Diverter

### Capability

**Dimensions:** 1050mmX1050mmX1300mm

**Working Height:** 1100+30mm

**Panel Size:** 635X635mm(Max) / 355X355mm(Min)

**Panel Thickness:** 0.036~4.0mm

**Power Supply:** 1Ph 220V SOHz O.SkW

**Air Supply:** 0.6MPa

**Capacity:** 8Pcs/min



## Double-row FPC Paper Interleave Unloader/Loader

### Capability

**Dimensions:** 1900mmX1000mmX1800mm

**Working Height:** 1100+30mm

**Panel Size:** 250/260X300mm(Min) /250/260X500mm(Max)

**Panel Thickness:** 0.036~ 1.2mm

**Power Supply:** 3Ph 380V SOHz 1.SkW

**Air Supply:** 0.6MPa



## Sun Buffer

### Capability

**Dimensions:** 1900mmX1080mmX1800mm

**Working Height:** 1100±30mm

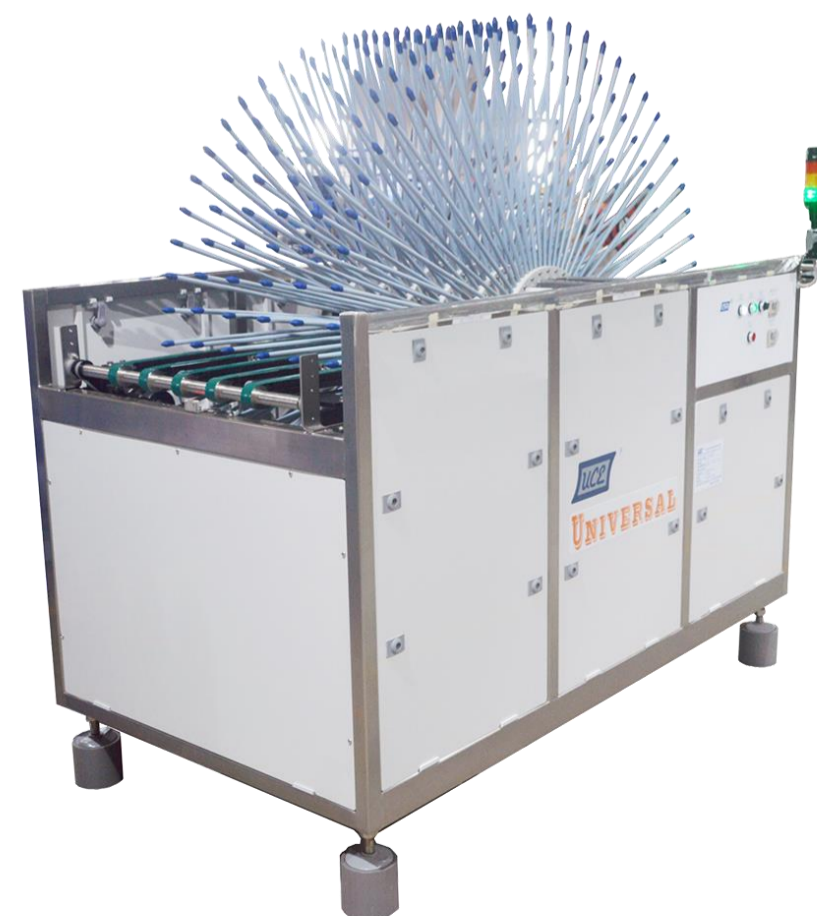
**Panel Size:** 635X635mm(Max) / 355X355mm(Min)

**Panel Thickness:** 0.075~4mm

**Power Supply:** 3Ph 380V SOHz O.SkW

**Air Supply:** 0.6MPa

**Capacity:** 10Pcs/min



## FPC Unloader/Loader

### Capability

**Dimensions:** 1400mmX900mmX1810mm

**Working Height:** 1100+30mm

**Panel Size:** 250/260X300mm(Min) /250/260X500mm(Max)

**Panel Thickness:** 0.036~ 1.2mm

**Power Supply:** 3Ph 380V SOHz 1kW

**Air Supply:** 0.6MPa

**Capacity:** 8Pcs/min





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