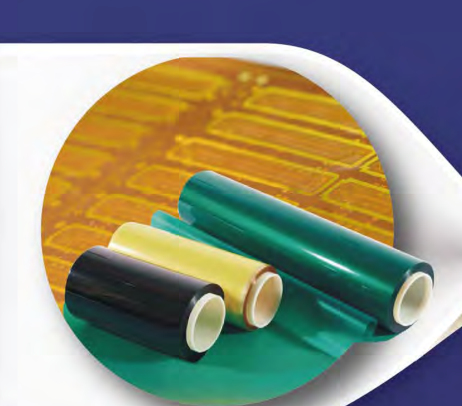
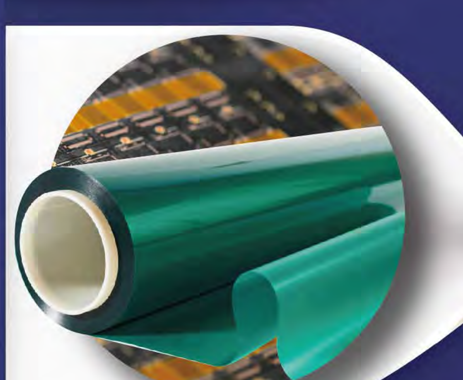
長興材料
ETERNAL MATERIALS

长远规划未来
兴创世界品牌



感光型覆盖膜 (PIC) Photo-Imageable Coverlay

低温150°C 烘烤型的高精密度干膜感光弱碱显像型光阻，应用于高精密度亚酰胺基板(PI)/金属基板外层线路保护。
具操作范围宽、优良解析能力与结构完整性、密着性佳、优良耐热焊锡性、耐化学镍金及优良柔韧性与低反翘力等特性。

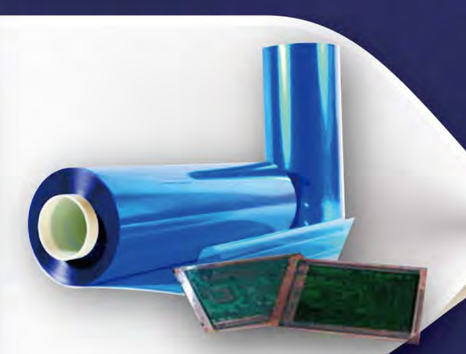


干膜防焊光阻 (DFSM) Dry Film Photoimageable Solder Mask

干膜防焊光阻，主要应用于线路保护，系采用预涂方式制作，其特点为涂布厚度非常均匀，适用于『需求高平整性』的产业，例如软板、高阶硬板、软硬结合板等产品的制作与应用。

液态文字油墨 Liquid UV Curable Marking Ink

UV 硬化型文字油墨属于网板印刷制程，适用于双面及多层印刷电路板的文字及图形标示印刷，油墨硬化后具优异之附着力、耐热性。



负型水溶性干膜光阻 (DF) Dry Film Photoresist

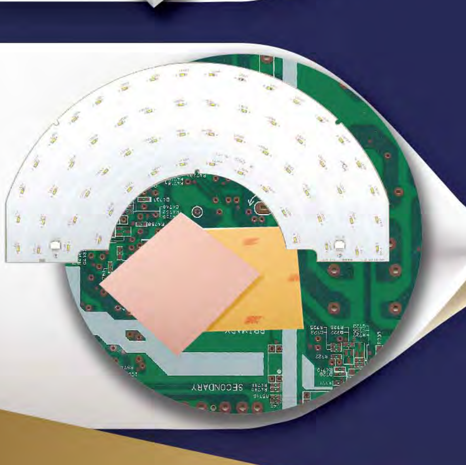
负型水溶性干膜光阻主要应用于印刷电路板、导线架、IC基板、IC封装、太阳能电池等精密蚀刻、电镀等工业之影像转移制程。
藉由坚强研发团队，长兴并可配合客户之特殊应用及需求，进行产品设计生产，例如电铸、化学精密蚀刻（Chemical Milling）等工业。

真空压膜机 Vacuum Laminator

真空压膜机包含全自动机，半自动机与依客户需求设计之客制机。
真空压膜机以独家传送膜搬运技术与真空压膜模块，整合热压系统等附属设备一体化，以提高生产效率。
应用于IC封装用载板外，亦适用于PCB/FPC/LED/半导体等相关制程应用。

精密涂布代工 Toll Coating Service

涂布产品跨及各产业，涂布产能布局全球。多元化Roll to Roll涂布设备暨丰富代工经验。
提供全方位涂布代工服务，满足各类涂布产品所需制程需求。



铜箔基板 Copper Clad Laminate

铜箔基板依制程技术及产品应用主要区分为FR-1，CEM-1和FR-4。
一般应用于民生家电，信息周边产品与相关通讯电子产品上，如液晶显示器、LED及传统照明等驱动电源板。

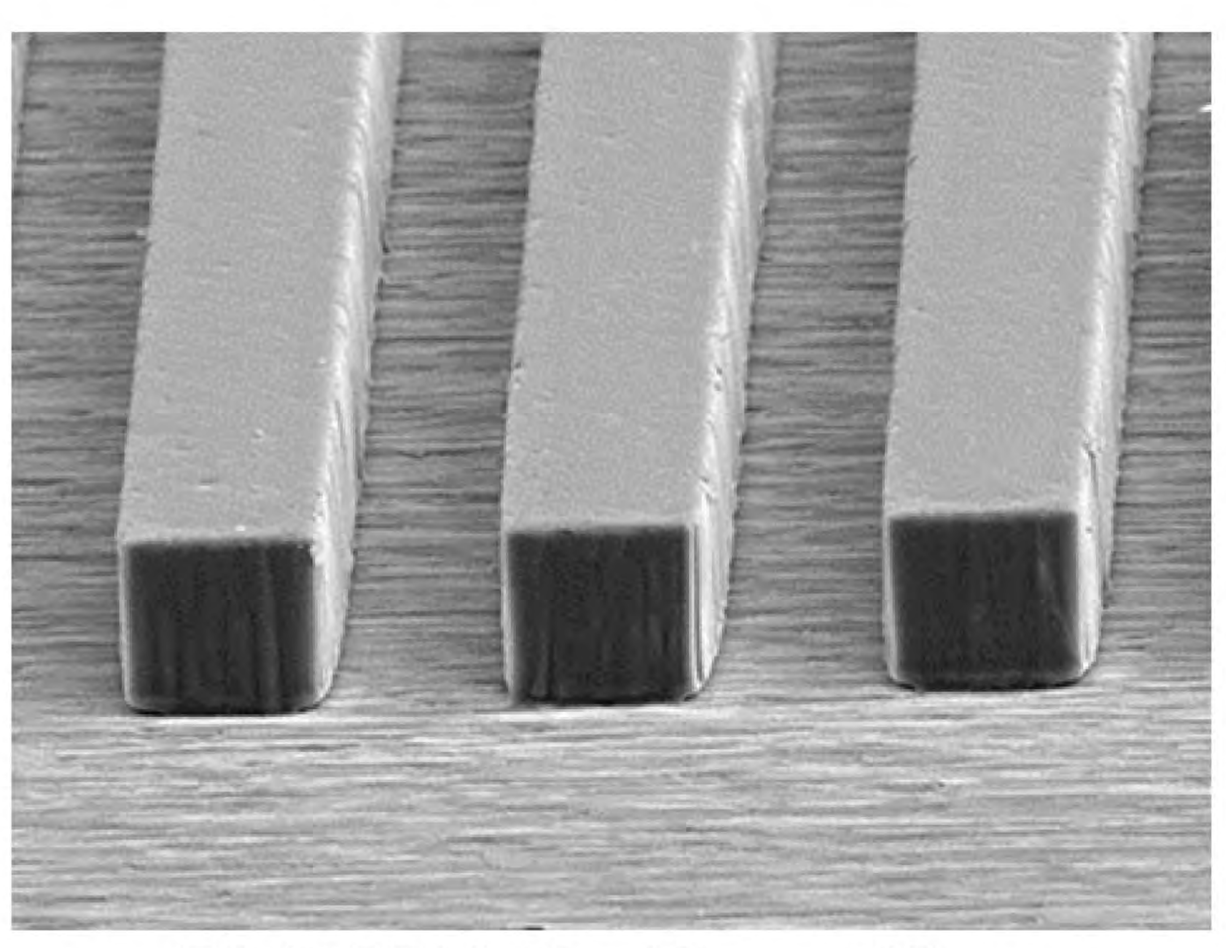
光阻事業部
Photoresist Materials Division

LAMINAR® E9400DI

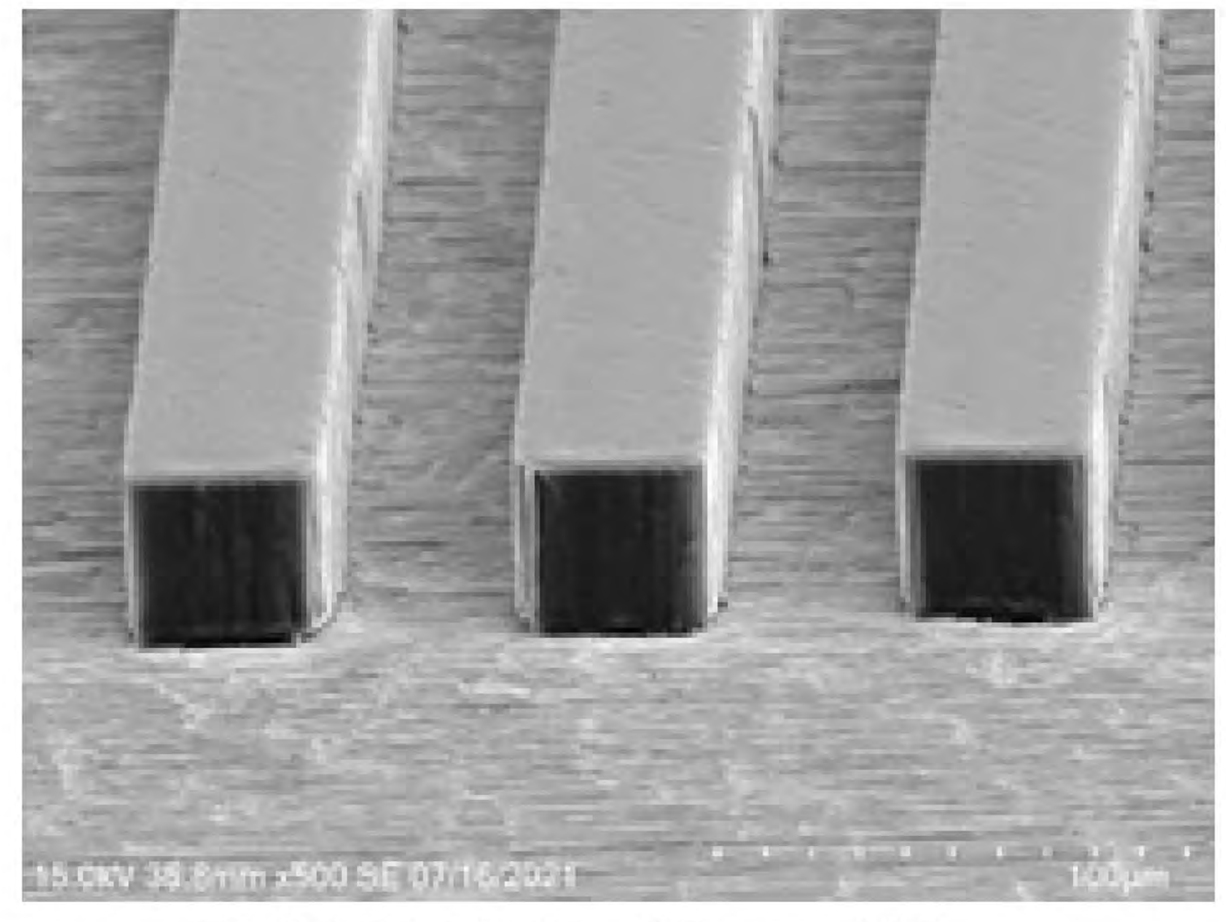
SEMI -LDI

SEMI-LDI DRY FILM PHOTORESIST

FEATURES	特性
Designed for conventional and DI/LDI exposure system applications	可同時於傳統曝光和雷射曝光製程設計
For conventional exposure system, i-line and h-line	適用於傳統曝光與DI/LDI i-line與h-line波長
Excellent tenting ability	優良蓋孔能力
Excellent resistance to plating	優良抗電鍍能力
Excellent high resolution and adhesion	優良線路解析度及附著力



E9415DI L/S=40 μm/40 μm
Collimated Light



E9415DI L/S=40 μm/40 μm
Nuvogo 800 (h-line)

CHARACTERISTICS

Item	E9415DI		
Thickness (μm)		38	
Exposure System	Collimated Light	LDI	LDI
Exposure Energy (mj/cm^2)	23	25 (i-line)*1	35 (h-line)*1
41 STOUFFER STEP HELD		22	
Minimum Developing Time x2 (sec)*2		45	
Adhesion (μm)*2	24	26	26
Resolution (μm)*2	36	34	34
Tent Breakdown*3 (via Φ 5.5 mm)		0	
Stripping Time (sec)*4		46	

*1: Test by **Orbotech Nuvogo800** *2: 50% BP, 28℃ *3: (Minimum Developing Time x2)x3 *4: 3% NaOH by dipping.

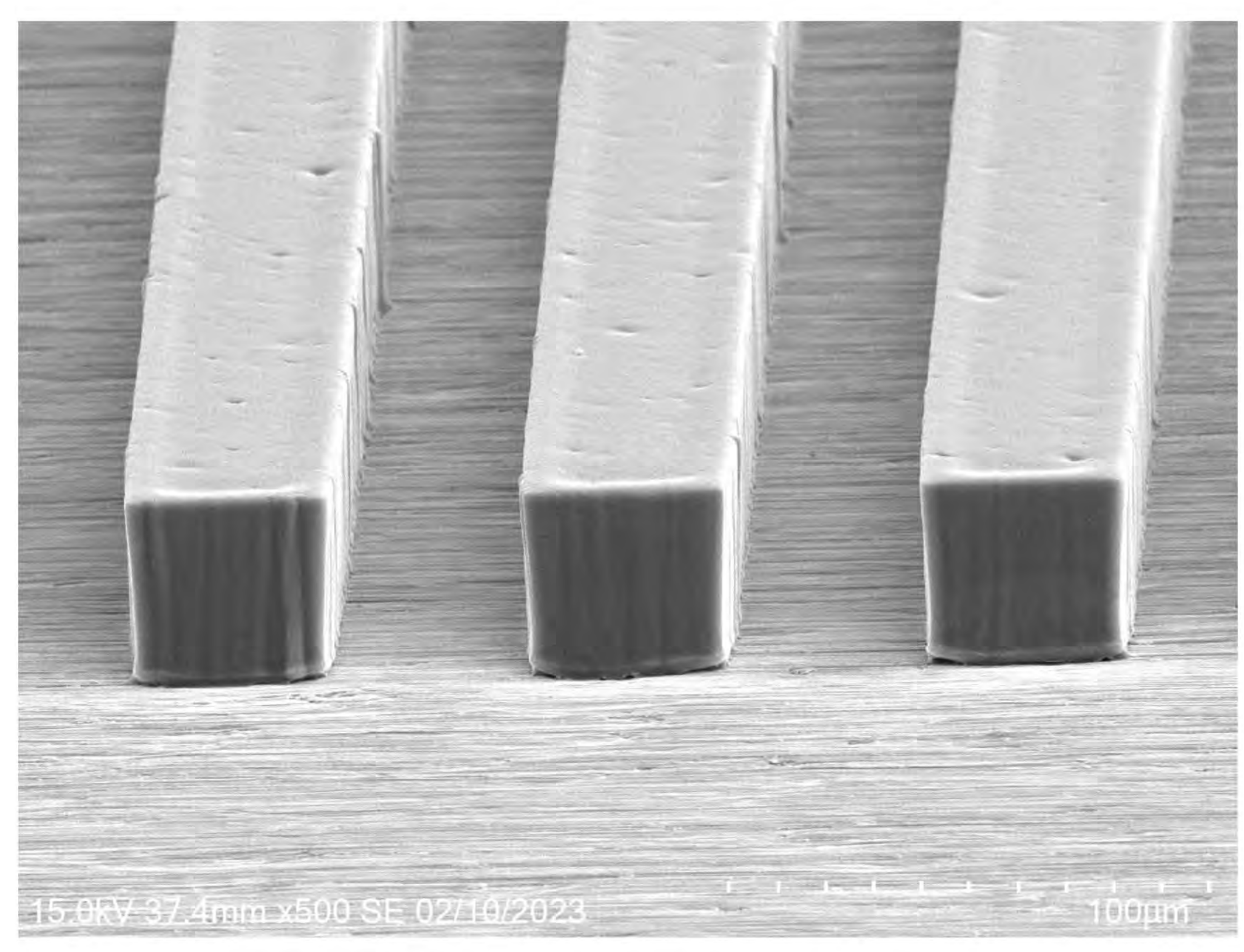
ETERTEC® HT100TDI SEMI-LDI

SEMI-LDI DRY FILM PHOTORESIST

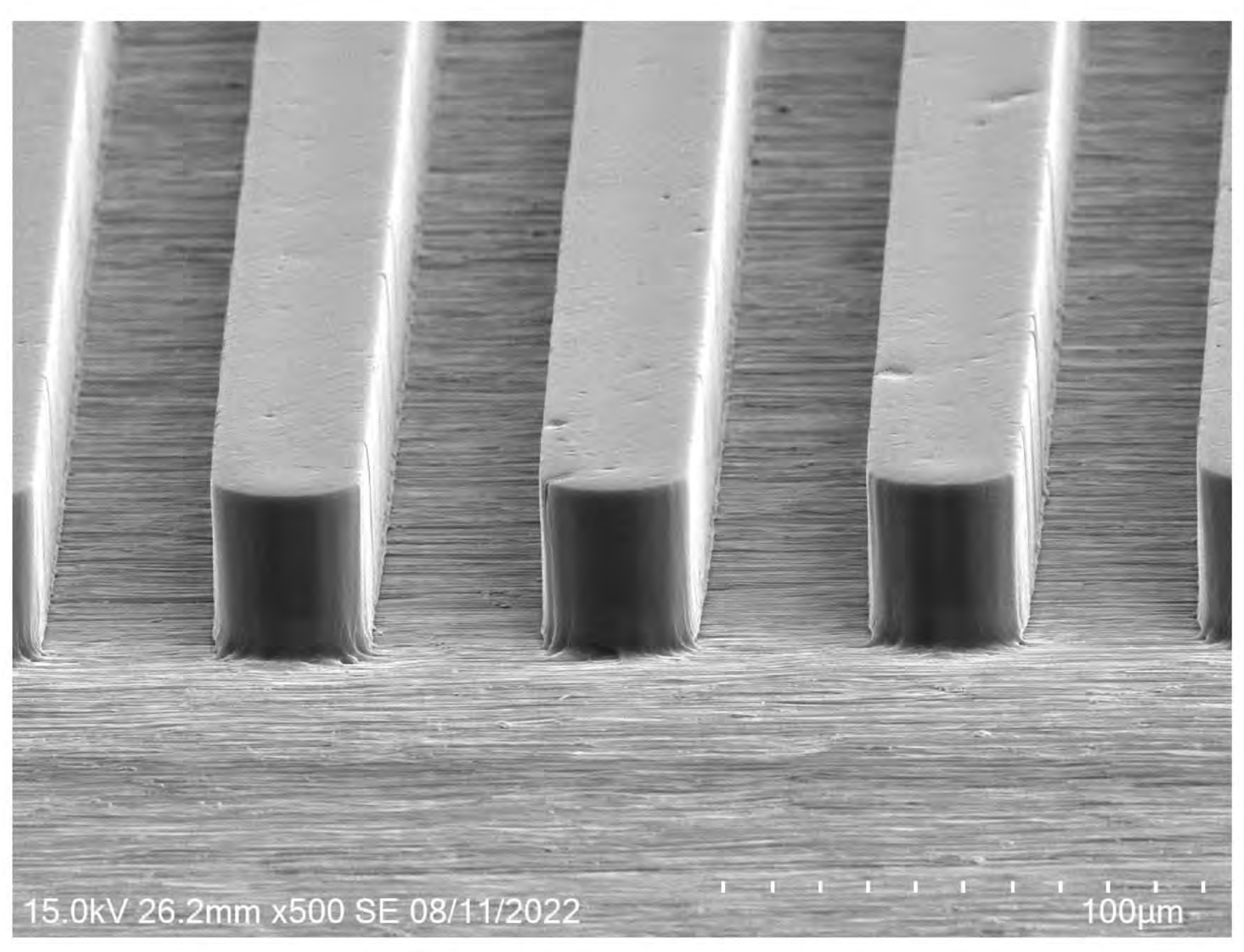
FEATURES	特性

- Designed for UV laser and Collimated light applications
- For conventional exposure system and DI exposure machine
- Excellent tenting ability
- Excellent high resolution and adhesion

- 針對同時使用於傳統曝光與雷射曝光製程設計
- 適用傳統曝光與DI曝光機
- 優良蓋孔能力
- 優良線路解析度及附著力



HT115TDI L/S= 40 μm / 40 μm
Collimated Light



HT115TDI L/S= 34 μm / 34 μm
h-line

CHARACTERISTICS

Item	HT115TDI	
Thickness (μm)	38	
Exposure System	Collimated Light	LDI
Exposure Energy (mj/cm^2)	18	30 (h-line)
41 STOUFFER STEP HELD	22	22
Minimum Developing Time x2 (sec)[*2]	50	
Adhesion (μm)[*2]	40	26
Resolution (μm)[*2]	40	34
Tent Breakdown (via Φ 5.5 mm)	0	
Stripping Break Time (sec)[*3]	43	

*1: Test by h-line DI machine *2: 50% BP, 28℃ *3: 3% NaOH by dipping.

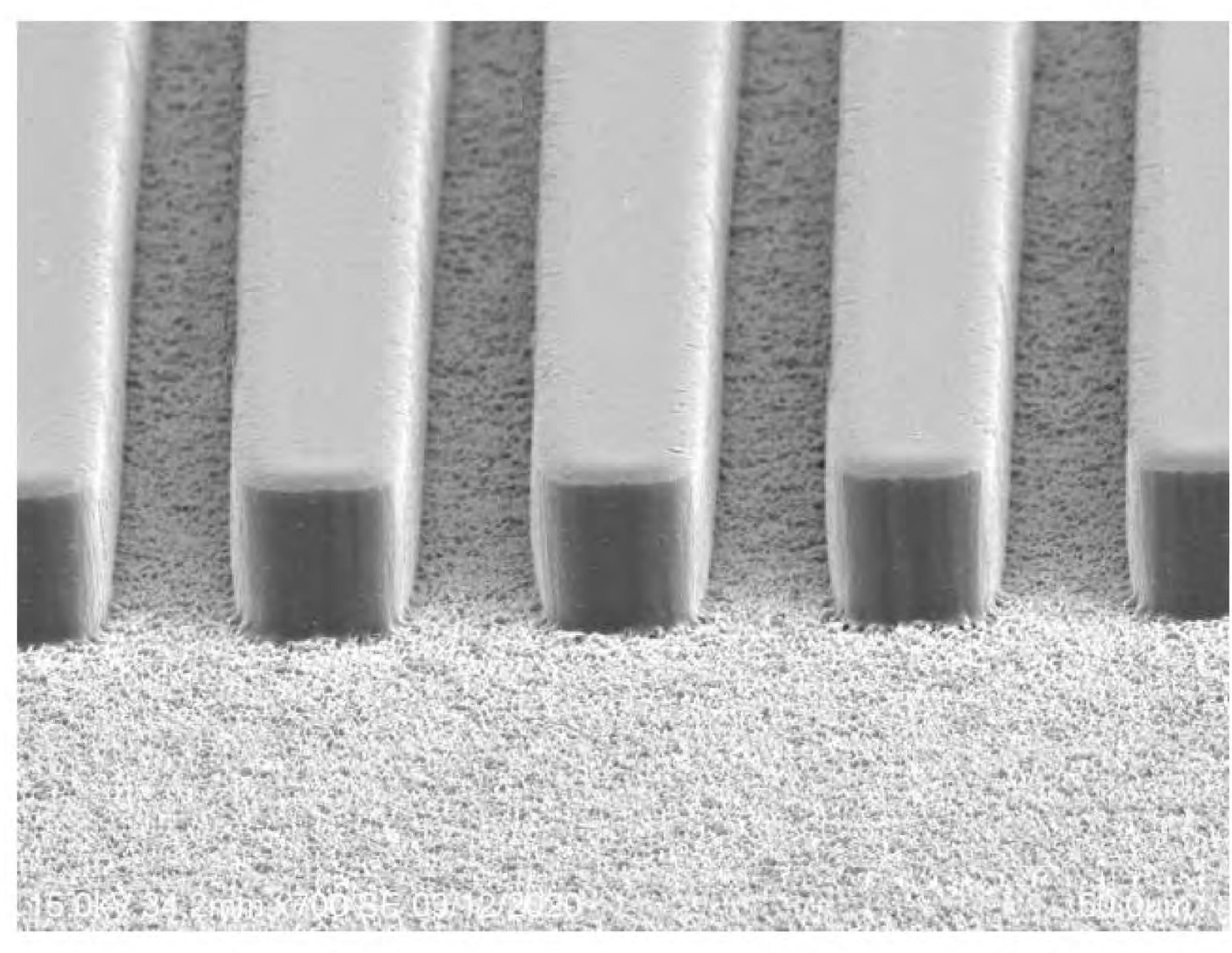
長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® UDF3200F HDI

LDI DRY FILM PHOTORESIST

FEATURES	特性
Designed for UV laser direct imaging applications	針對雷射曝光製程設計
For i-line and h-line	適用**i-line**與**h-line**波長
Excellent tenting ability	優良蓋孔能力
Excellent high resolution and adhesion	優良線路解析度及附著力



UDF3230F L/S=22 μm/22 μm (h-line)

CHARACTERISTICS

Item	UDF3230F	
Thickness (μm)	29	
Wavelength	i-line	h-line
Exposure Energy (mj/cm^2) [*1]	11	13
41 STOUFFER STEP HELD	19	19
Minimum Developing Time x2 (sec)[*2]	33	33
Adhesion (μm)[*2]	24	20
Resolution (μm)[*2]	24	22
Stripping Break Time (sec)[*3]	37	
Tent Breakdown	0 (Φ 4mm)	

*1: Test by **Orbotech Nuvogo800** *2: 50% BP, 28℃ *3: 3% NaOH, 50℃

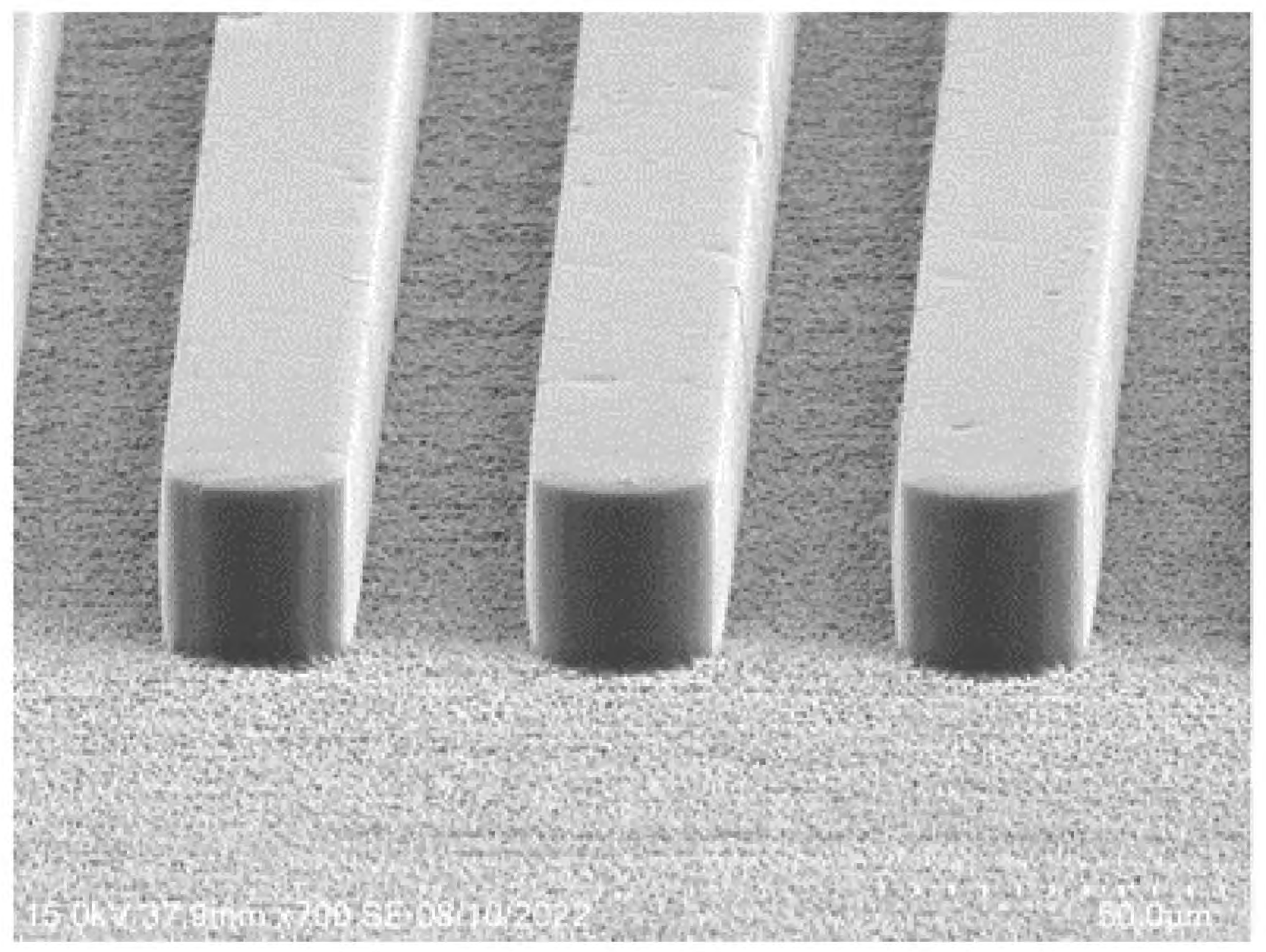
長興材料 ETERNAL MATERIALS

Photoresist Materials Division

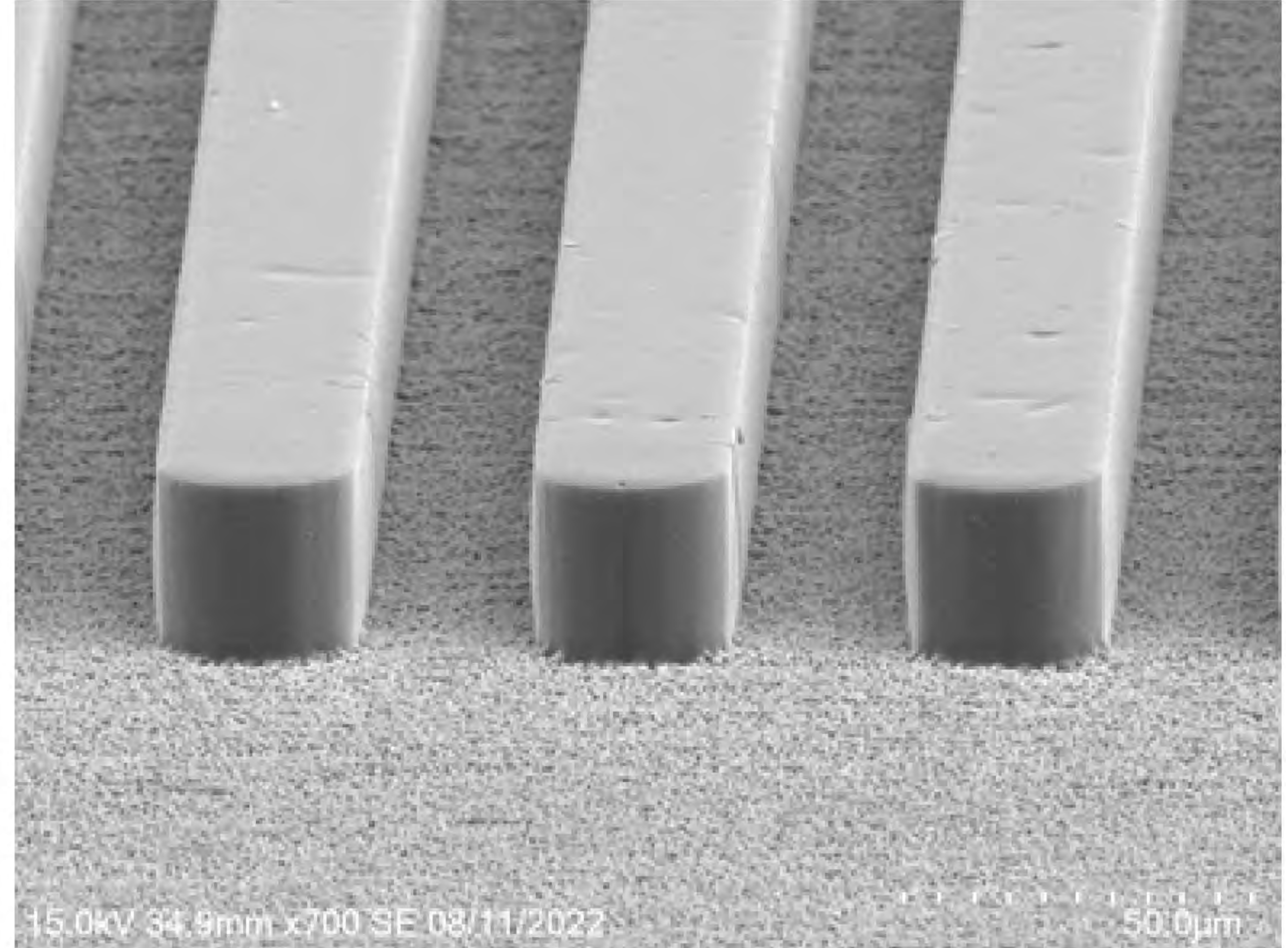
ETERTEC ® UDF3100F HDI

LDI DRY FILM PHOTORESIST

FEATURES	特性
Designed for UV laser direct imaging applications	針對雷射曝光製程設計
For i-line and h-line	適用 i-line & h-line波長
Excellent tenting ability	優良蓋孔能力
Excellent high resolution and adhesion	優良線路解析度及附著力



UDF3127F 19/41sst L/S=24 μm/24 μm



UDF3127F 22/41sst L/S=22 μm/22 μm

CHARACTERISTICS

Item	UDF3127F	
Thickness (μm)	27	
Wavelength	h-line	
Exposure Energy (mj/cm^2) *1	9	12
41 STOUFFER STEP HELD	19	22
Minimum Developing Time x2 (sec) *2	36	
Adhesion (μm) *2	24	22
Resolution (μm) *2	24	22

*1: Test by **ADTEC** (h-line) *2: 50% BP, 28℃

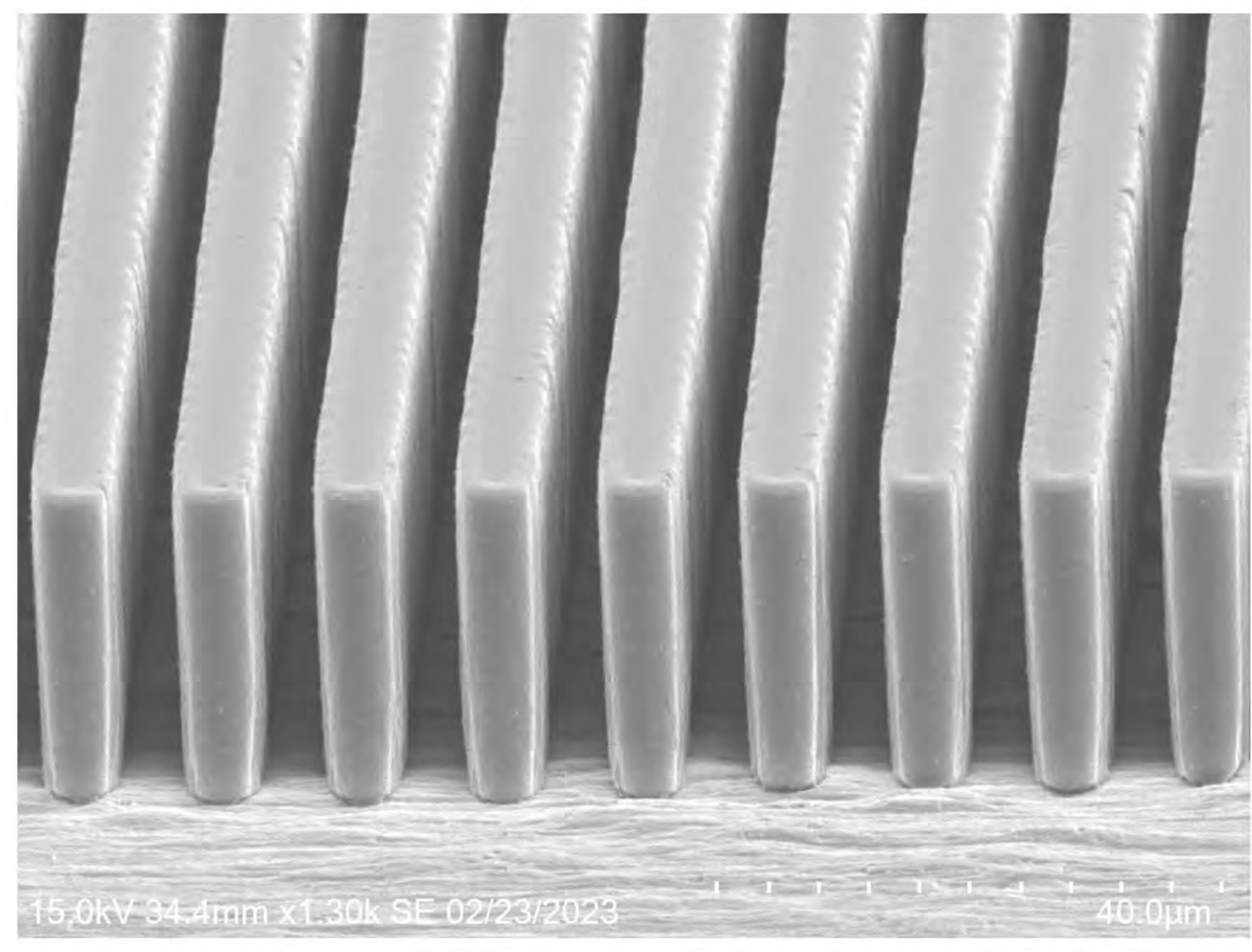
長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® UDH5600 SAP /mSAP

LDI DRY FILM PHOTORESIST

FEATURES	特性
Designed for UV laser direct imaging applications	針對雷射曝光製程設計
For i-line & h-line	適用 i-line & h-line
For SAP/mSAP	可用 SAP/mSAP
Excellent chemical resistance	優良抗化性
Excellent resolution and adhesion	優良線路解析度及附著力



UDH5625 L/S= 5.5 μm / 5.5 μm

CHARACTERISTICS

Item	UDH5625
Thickness (μm)	25
Exposure Energy (mj/cm^2) *1	60
41 STOUFFER STEP HELD	13
Minimum Developing Time x2 (sec) *2	44
Adhesion (μm) *2	5.5
Resolution (μm) *2	5.5
Stripping Break Time (sec) *3	42

*1: Test by h-line DI machine *2: 50% BP, 28℃ *3: 3% NaOH by dipping.

Photoresist Materials Division

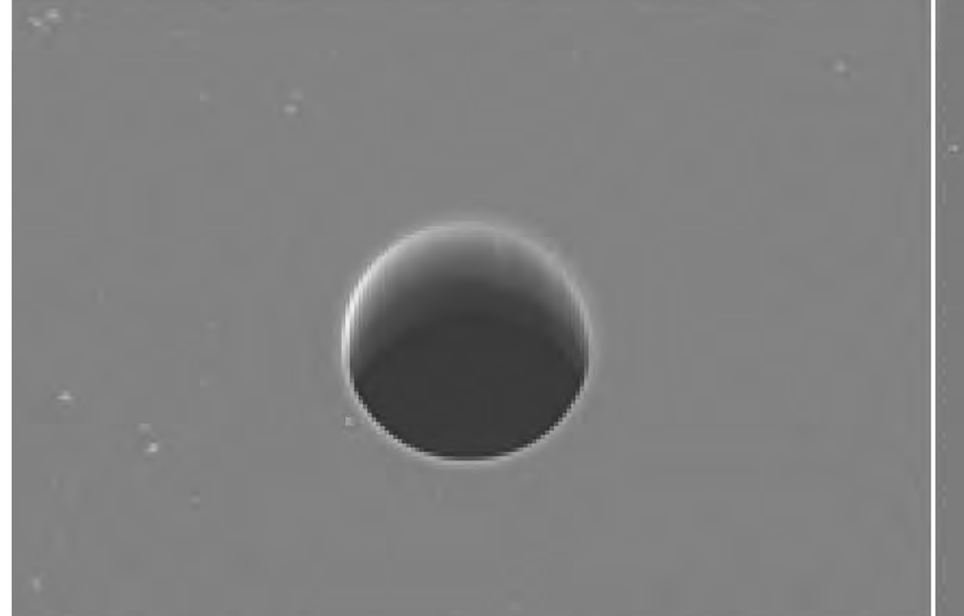
ETERTEC® BR42000

Advanced Package

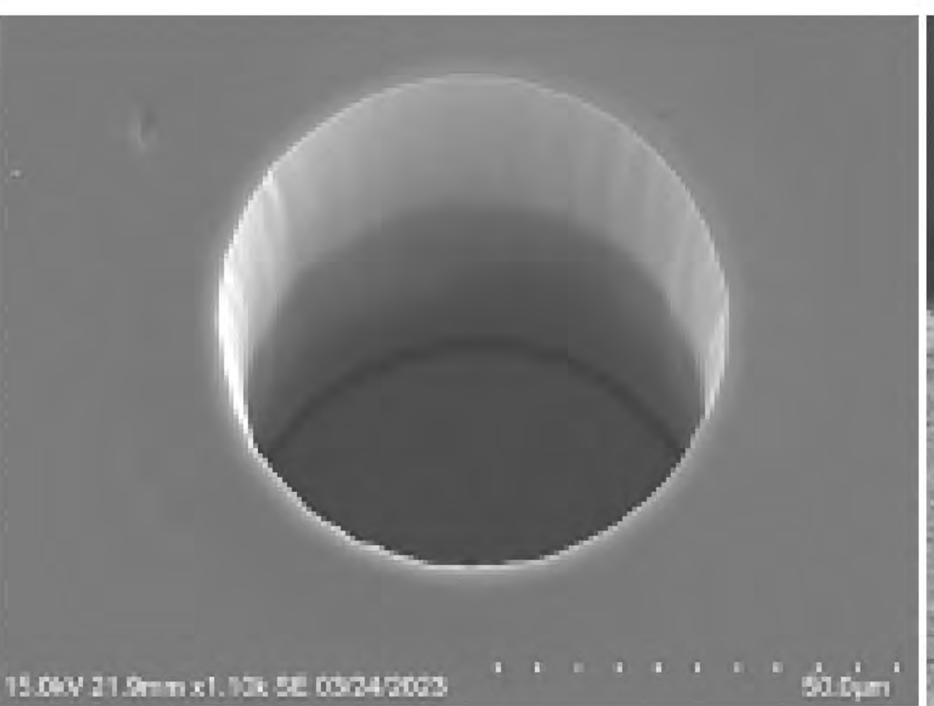
DRY FILM PHOTORESIST

FEATURES	特性
High resolution, high aspect ratio	極佳線路解析度與深寬比
Excellent adhesion	極佳線路附著力
Copper pillar bump for semiconductor package	適用於半導體封裝銅柱凸塊
Easy to Strip	去膜容易

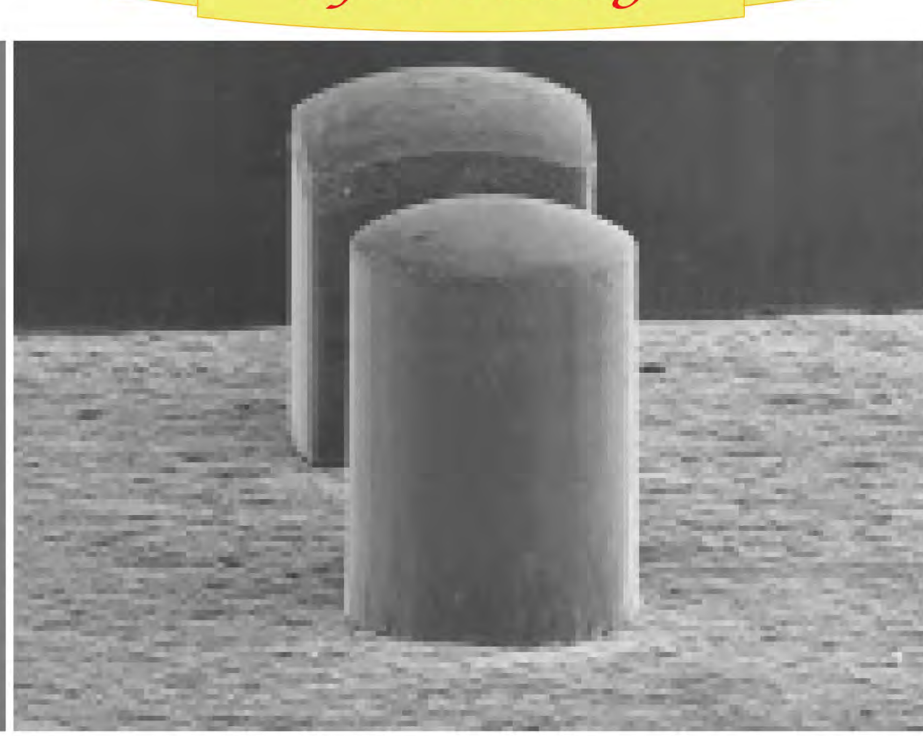
After Plating



BR42120 Diameter=40 μm



BR42240 Diameter=80 μm



BR42120 Diameter=40 μm

CHARACTERISTICS

Item	BR42080	BR42120	BR42240
Thickness (μm)	80	120	240
Exposure Energy (mj/cm^2) *1	200	220	300
41 STOUFFER STEP HELD	22	22	25
Minimum Developing Time x2 (sec) *2	120	230	460
Adhesion (μm) *2	25	40	80
Resolution (via) (μm) *2	30	40	80

*1: Exposure: Projection *2: 50% BP, 28℃

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

LAMINAR® E7700M

ENIG

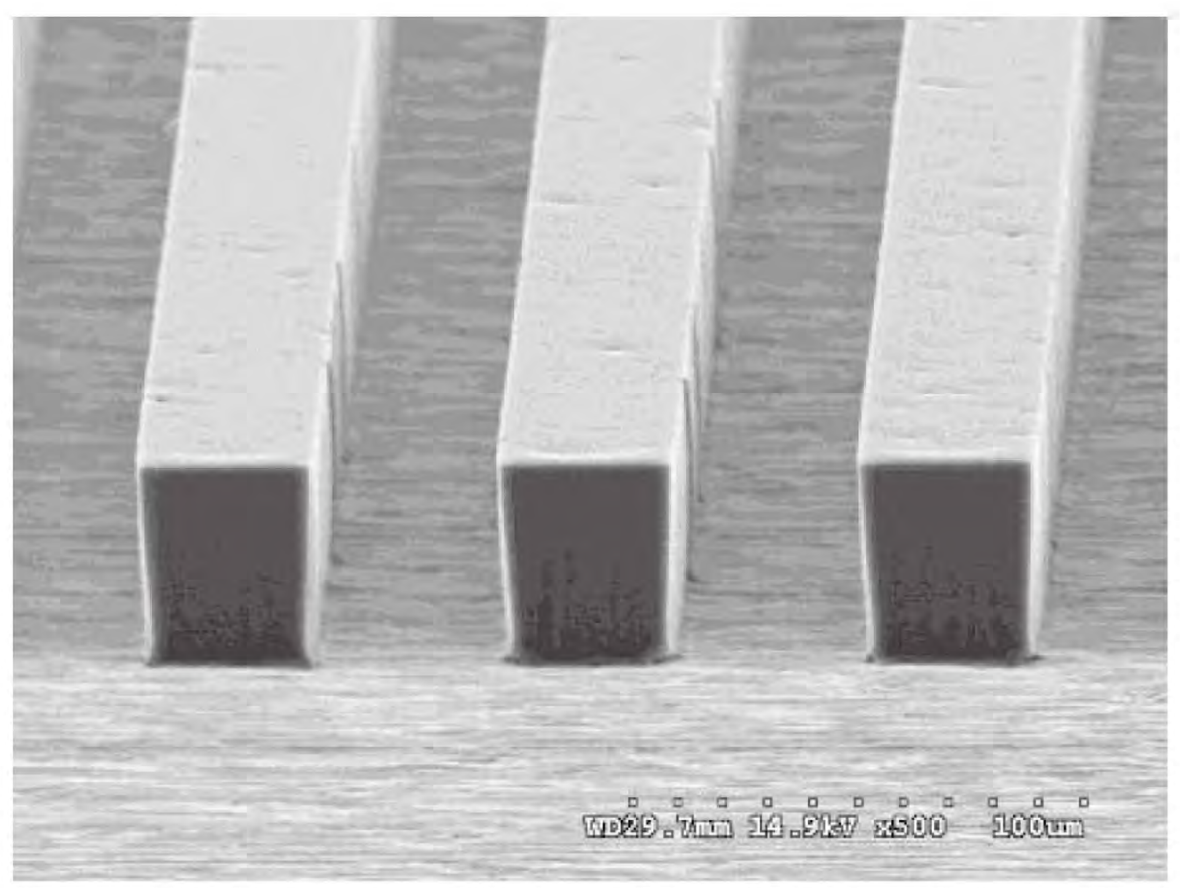
DRY FILM PHOTORESIST

FEATURES	特性
Excellent resistance to **ENIG**	對化鎳浸金製程具優良抗化性
Excellent resistance to **Alkaline etching**	對鹼性蝕刻製程具優良抗化性
Excellent tenting ability	蓋孔能力佳
High resolution	線路解析力高
Low developing foaming	顯影泡沫低

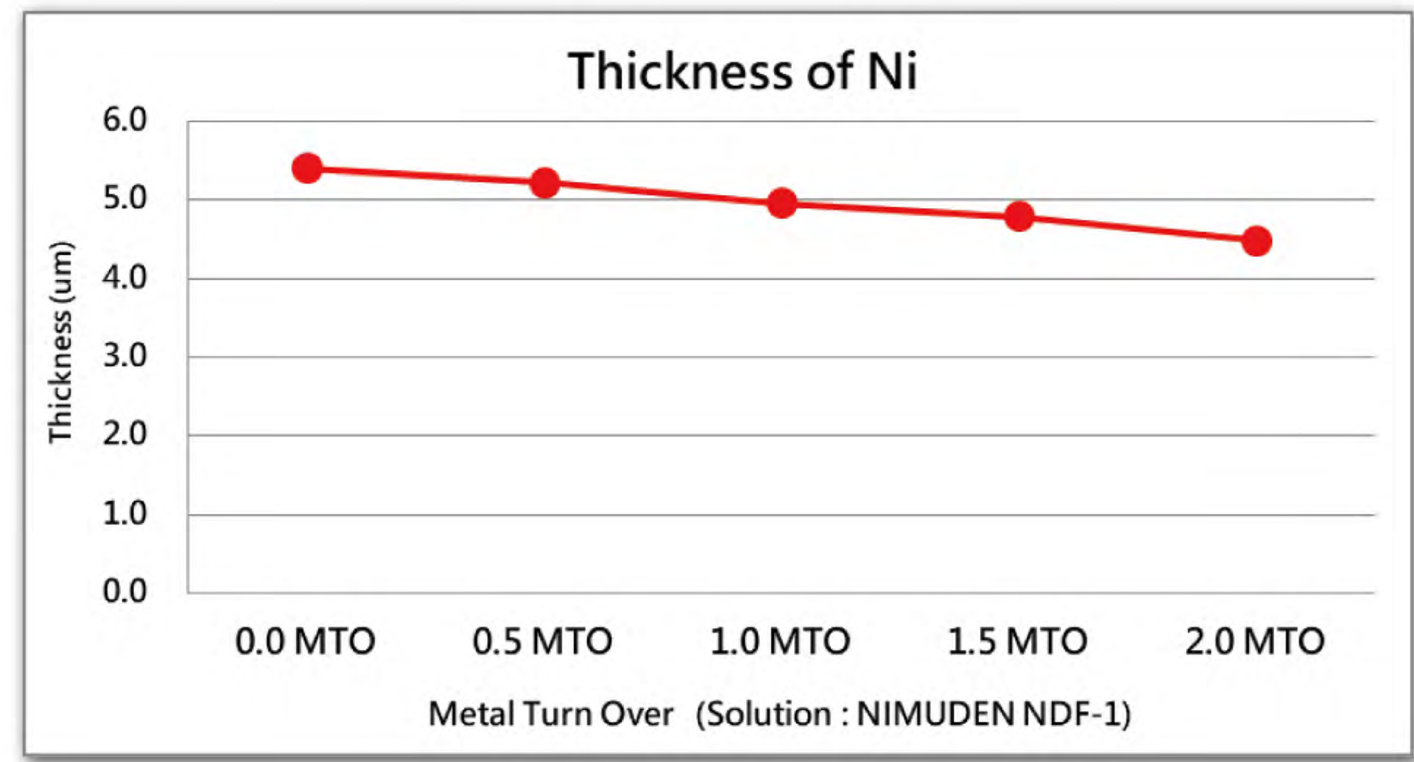
CHARACTERISTICS

Item		E7720M
Thickness (μm)		49
Exposure Energy (mj/cm^2)		80
41 STOUFFER STEP HELD		22
Minimum Developing Time x2 (sec)*1		54
Adhesion (μm)*1		22
Resolution (μm)*1		36
Tent Breakdown (via Φ 5.5 mm)		0
Stripping Break Time (sec) *2	On Copper	59
	On Solder Mask	57

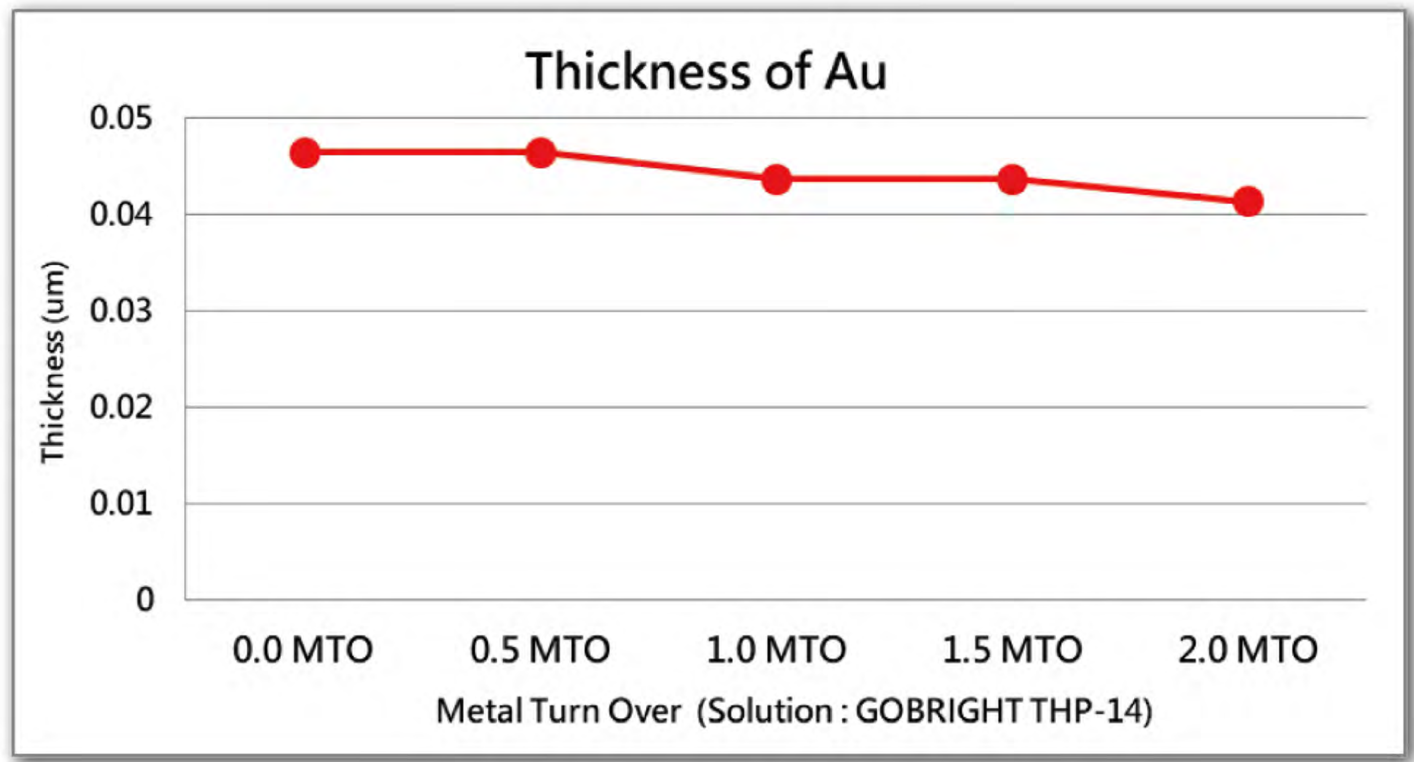
*1: 50% BP, 28℃ *2: 3% NaOH by dipping.



E7720M L/S=40 μm /40 μm



Thickness of Ni



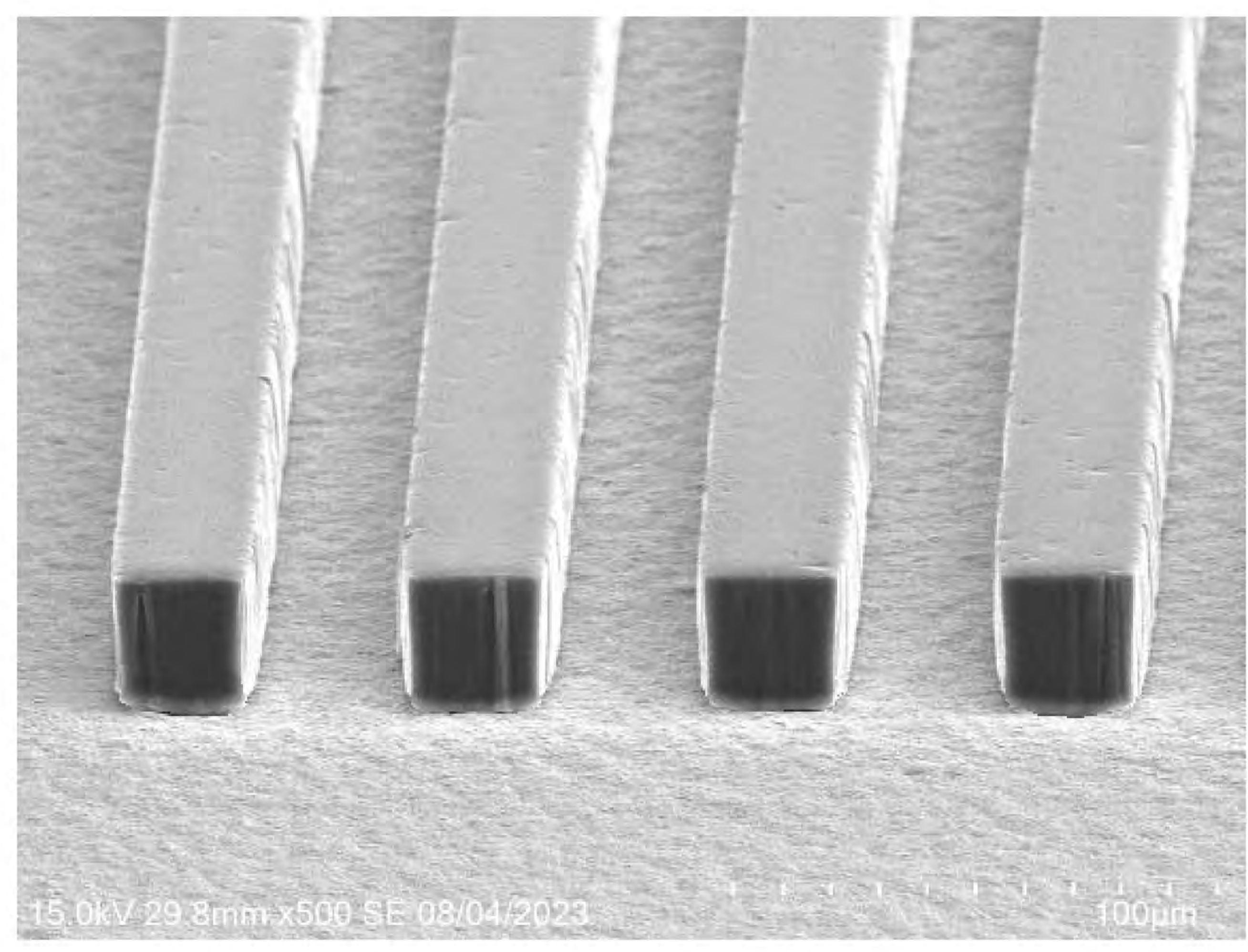
Thickness of Au

ETERTEC® HT2600

FPC

DRY FILM PHOTORESIST

FEATURES	特性
High throughput	高產能
Broad processing latitude in each process step	於各製程段有較廣操作區間
Designed for FPC applications	針對FPC製程設計
Good tenting behavior characteristic	優良蓋孔能力
Excellent high resolution and adhesion	優良線路解析度及附著力
Easily stripping with small flake size	去膜容易且膜屑小



HT2612 19/41sst L/S=30 µm/30 µm

CHARACTERISTICS

Item	HT2612	
Thickness (µm)	29	
Exposure Energy (mj/cm^2) *1	16	21
41 STOUFFER STEP HELD	16	19
Minimum Developing Time x2 (sec) *2	38	
Adhesion (µm) *2	26	22
Resolution (µm) *2	28	26
Stripping Break Time (sec) *3	21	

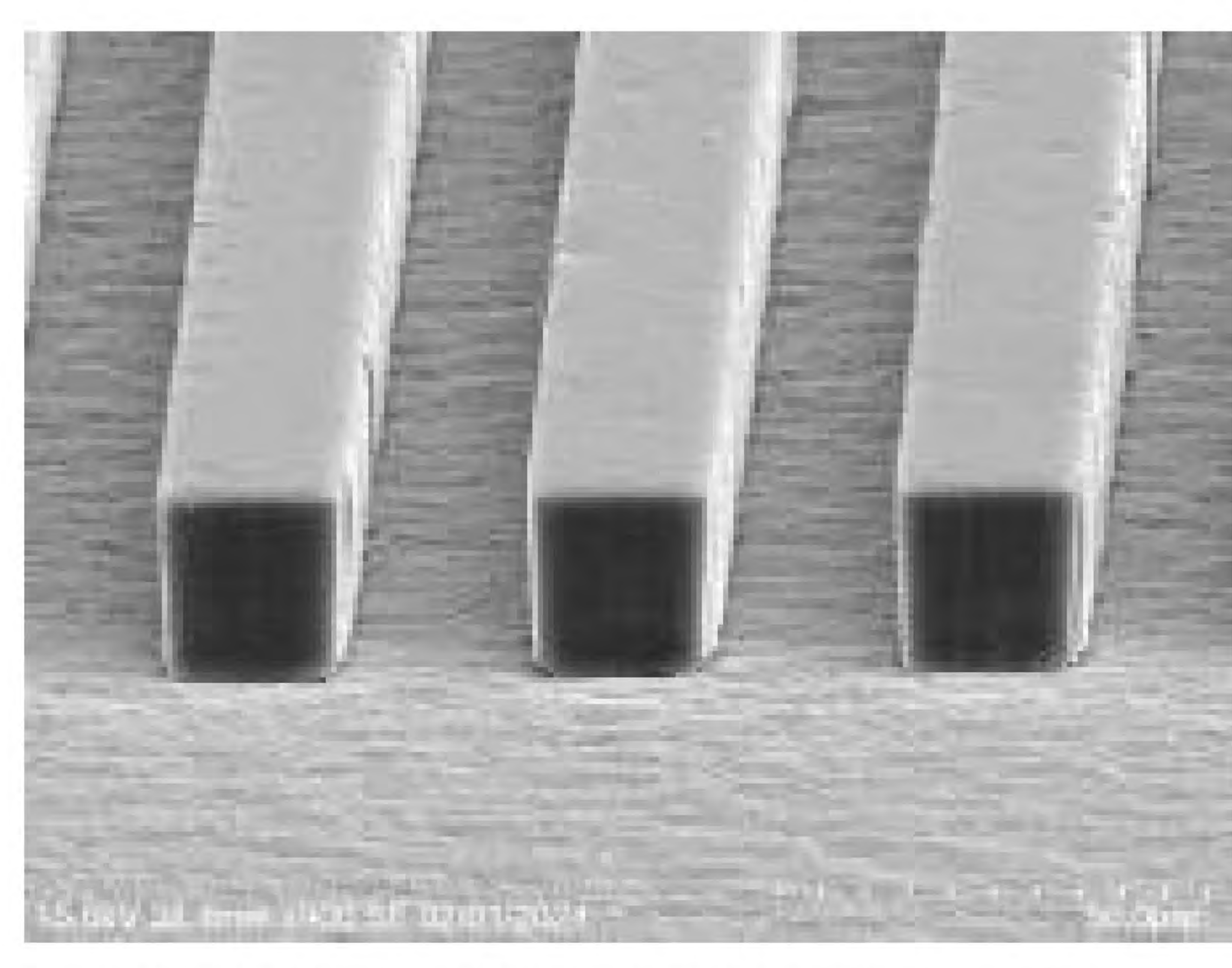
*1: Test by **ORC EXM-1201F 5KW** *2: 50% BP, 28℃ *3: 3% $NaOH_{(aq)}$, 50℃ by dipping

ETERTEC® APR500

FPC

DRY FILM PHOTORESIST

FEATURES	特性
Designed for FPC applications	針對FPC製程設計
Excellent tent ability & flexibility	優良蓋孔能力和撓折性
Excellent high resolution and adhesion	優良線路解析度及附著力
Easily stripping/ break flake size	去膜容易/膜屑小



APR508 16/41sst L/S=16 μm/16 μm

CHARACTERISTICS

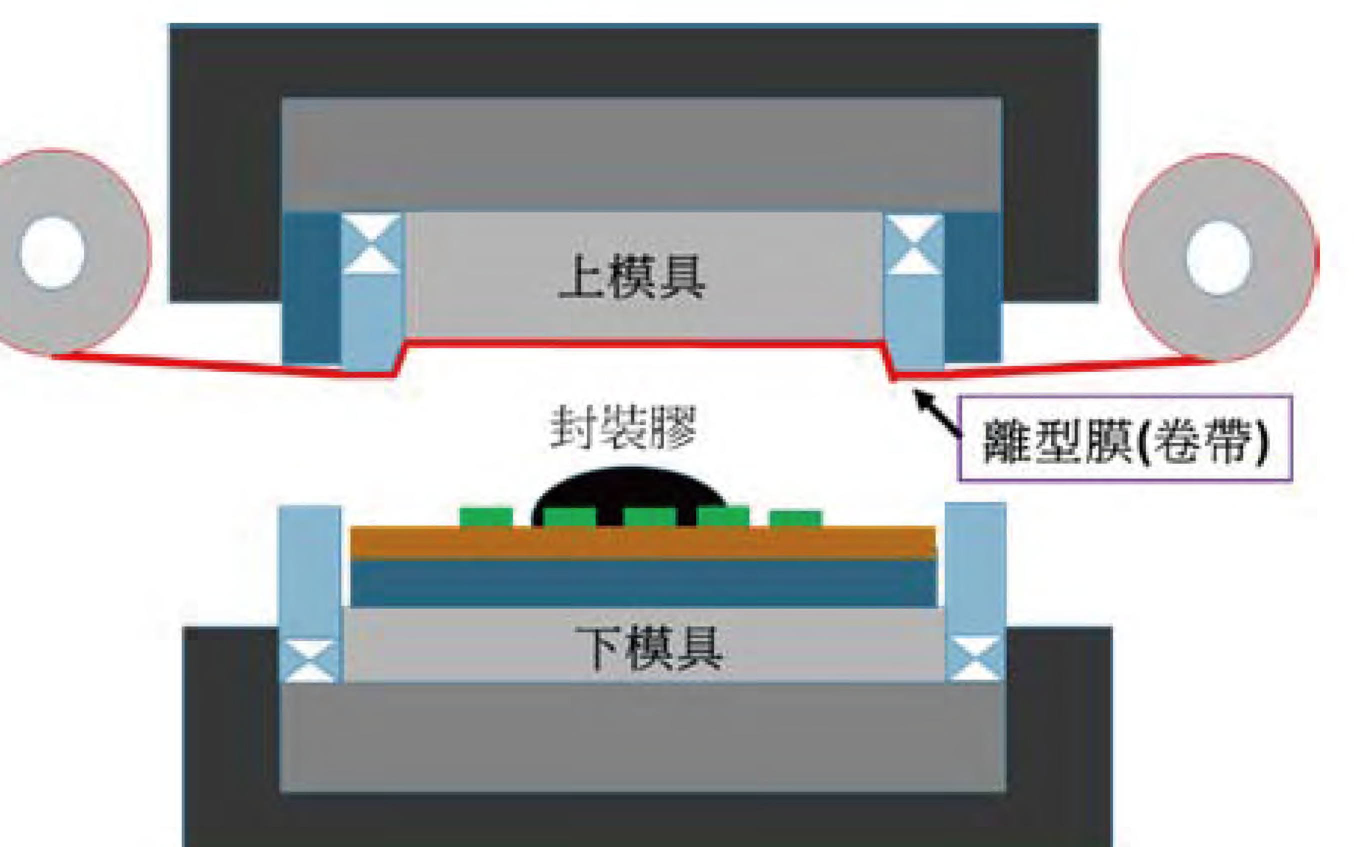
Item	APR508	
Thickness (μm)	20	
Exposure Energy (mj/cm²) *1	21	29
41 STOUFFER STEP HELD	13	16
Minimum Developing Time x2 (sec) *2	25	
Adhesion (μm) *2	14	12
Resolution (μm) *2	14	16
Stripping Break Time (sec) *3	13	

*1: Test by **ORC EXM-1201F 5KW** *2: 50% BP, 28℃ *3: 3% $NaOH_{(aq)}$, 50℃ by dipping

Release Film MR-Series

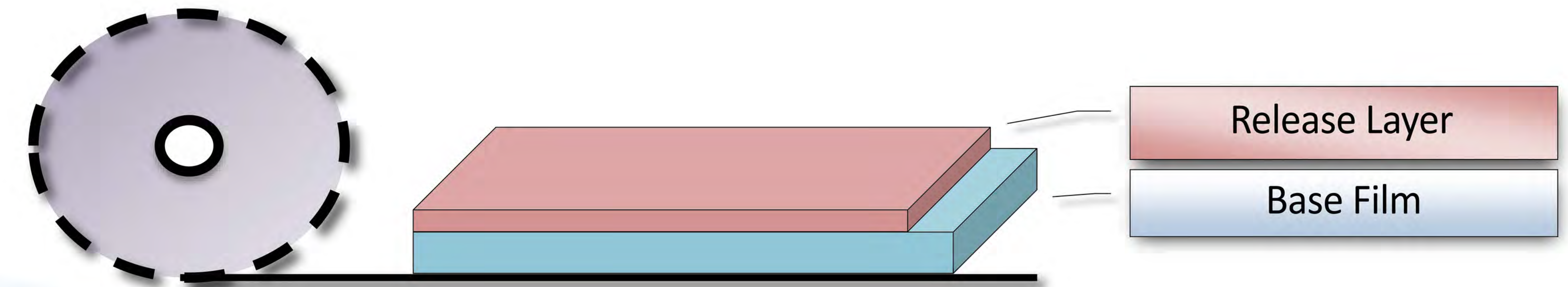
Release Film for Chip Molding Process

封裝製程離型膜



- 簡介（**Introduction**）：
  晶片封裝製程使用之離型膜
- 特性（**Performance**）：
  提供高溫下易服貼模具及低離型力之易操作性
- 技術資料（**TDS**）：

Trade name					MR62011
Test item.			Unit	Method	Data
Dimension	Total Thickness		um	ETERNAL Method (ASTM D5947)	68
Physical property	Roughness	Ra	um	JIS B0601 2001	2.5
		Rz			16.0
	Tensile Strength	MD	Mpa	ASTM D 882	90
		TD			90
	Tensile Elongation	MD	%		140
		TD			140
	Young's modulus	MD	Gpa		2.50
		TD			2.50
	Melting point		℃	ETERNAL Method	209
	Shrinkage	MD	%	ASTM D 2305 150℃,30min	2.0
		TD			0.0
	Water contact angle		°	ETERNAL Method	106
	Specific Gravity		g/cm^3	ASTM D792	1.37



Photoresist Materials Division

半導體與電子構裝封裝材料
Semiconductor and Electronic Encapsulation Materials

技術核心 / Core Technologies

大面積面板級封裝
電子紙封框膠

低翹曲
smile~cry warpage
(<400μm，when mold 750μm thickness on 12" wafer)

高密著
(≥60N/mm² @Si)

特殊環氧配方開發
無機填料表面處理

底部填充膠

耐高溫
(T_g=200℃，T_d (TGA)>400℃)

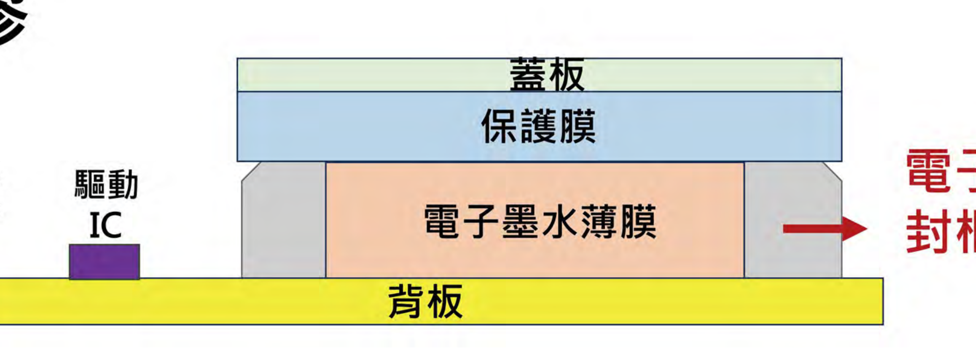
填縫佳
(Ti≒0.5)

電子絕緣保護
IGBT

用途 / Application

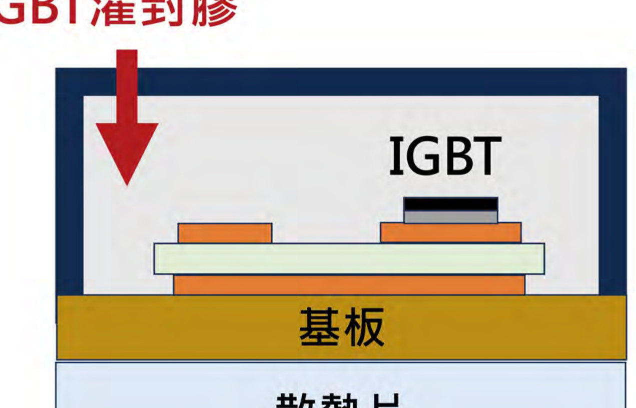
電子紙封框膠

特色：
- 低溫固化
- 低吸溼透水率
- 密著佳



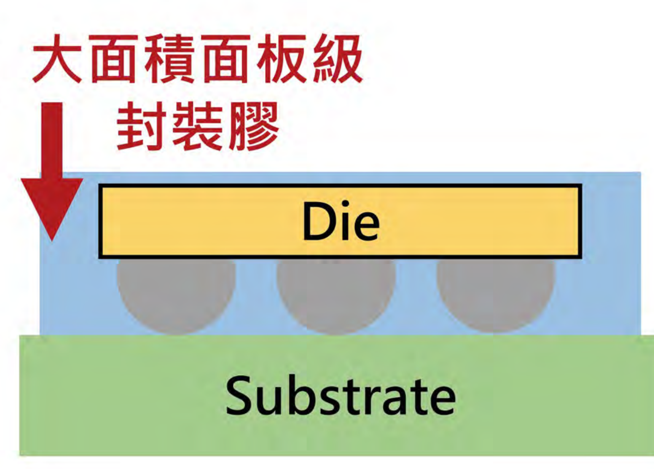
底部填充膠

特色：
- 快速固化
- 優異填隙能力
- 重工性可選



IGBT灌封膠

特色：
- 高Tg
- 低CTE
- 優異填隙能力



大面積面板封裝膠

特色：
- 低CTE
- 低翹曲表現
- 優異填隙能力

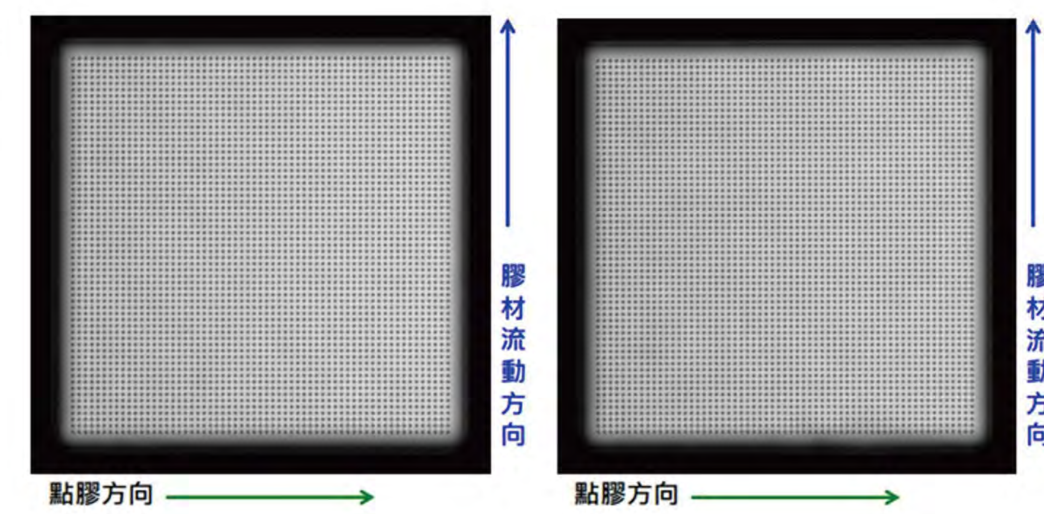
大面積面板級 封裝膠

Die

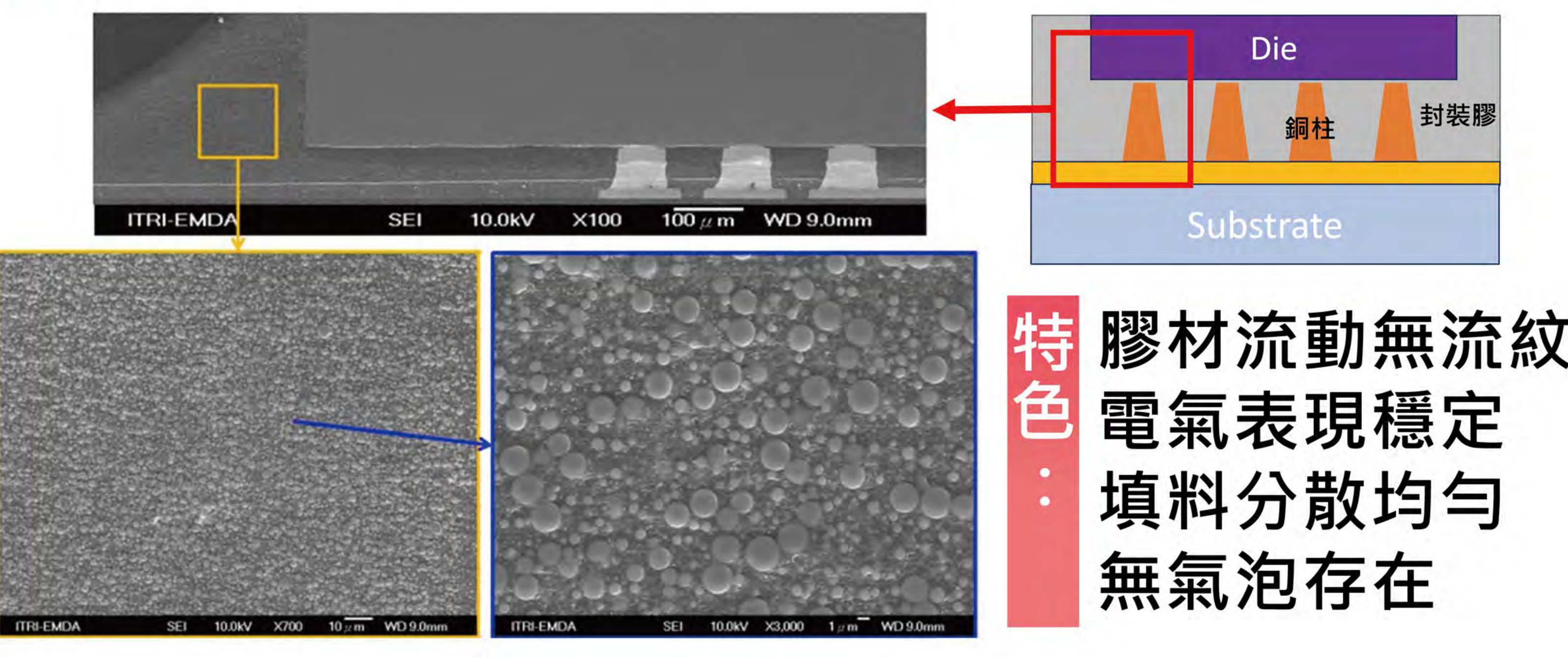
Substrate

技術內容 / Technical Information

SAT分析

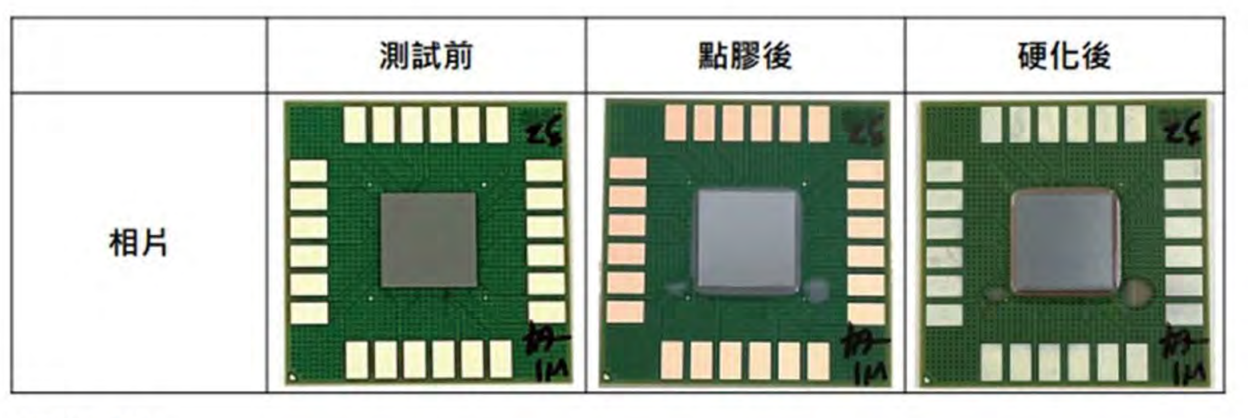


封裝膠截面分析



特色：
- 膠材流動無流紋
- 電氣表現穩定
- 填料分散均勻
- 無氣泡存在

電氣表現



電性量測

	Resistance measurement (Ω)(DAISY CHAIN PATH)								
	No.1,2-No.23,24	No.5,6-No.7,8	No.11,12-No.13,14	No.17,18-No.19,20	No.15,16-No.21,22	No.4-No.5	No.8-No.9	No.10-No.15	No.3-No.10
點膠前	12.5	12.5	12.5	12.5	14.0	3.5	2.8	2.1	1.3
硬化後	12.4	12.4	12.4	12.4	13.9	3.5	2.8	2.1	1.4
SAT後	12.4	12.4	12.4	12.4	13.9	3.5	2.8	2.1	1.4

真空壓膜機

EFV-1000 VACUUM LAMINATOR

Features 特色

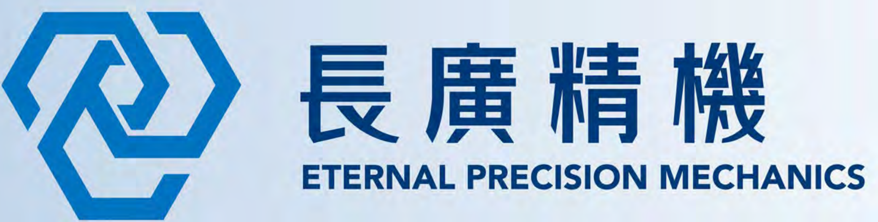
- High vacuum lamination prevents the occurrence of micro void
  高效能的真空壓膜方式,可以預防微小氣泡不良的產生
- High vacuum performance → 1hpa within 30sec from starting vacuum
  高效率的抽真空速度 → 抽真空開始後30秒內可以達到1hpa
- Easy operation and maintenance
  簡易的操作介面及維護保養工作
- Design with customization demand
  可配合客製化需求的設計

Applications 應用

Market	Process	Structure	Materials	Products
PCB/ FPC/ IC substrate	Selective Gold(OSP) Process	(A) Film (B) Board (A) Film □Single ；■Double Pressing	(A) Dry film (Dupont W250/...) (B) PCB/FPC/IC substrate Thickness：0.2～2mm	
FPC	PIC Process (Coverlay+Solder Mask)	(A) Film (B) Board (A) Film □Single ；■Double Pressing	(A) PIC film (Eternal/PR82XXX,EPD33XX) (B) FPC Thickness：0.1～1 mm	
PCB/FPC	Rigid-Flex HDI Process or DF Solder Mask Process	(A) Film (B) Board (A) Film ■Single ；■Double Pressing	(A) Dry film (B) Rigid-Flex Thickness：0.2～2 mm	
IC/Passive Components	Dry film/DF Solder Mask Process	(A) Film (B) Board ■Single ；■Double Pressing	(A) Dry film (B) Substrate Thickness：0.3～1 mm	
Mini-LED Micro-LED	Backlight for Mini-LED or Othes Film	(A) Film (B) Board (A) Film □Single ；■Double Pressing	(A) DFSM or Others Film (B) PCB/FPC or Display Thickness：0.3～2 mm	

- 適用各類Film材料 → 表面有高低差壓合作業
  Suitable for Film materials
  → Laminating on Surface Pattern
- 選配預貼機系統 → 實現全自動生產線
  Optional Pre-tack system
  → Automatic Production Line

長興材料
ETERNAL MATERIALS



日興材料 真空壓膜機

Nikko-Materials' Vacuum Laminators

氣囊式真空壓膜機產品系列

Diaphragm Type Vacuum Laminator Line-Up

Type	Model	1st Stage	2nd Stage	Applicable Work-Size(mm)
Auto	CV-300	Diaphragm	-	610 x 610
	CV-300T	Diaphragm	-	350 x 350 (Option 400 x 400)
	CVP-300	Diaphragm	Flattening Press	510 x 510 (Option 510 x 610)
	CVP-300T	Diaphragm	Flattening Press	350 x 350 (Option 400 x 400)
	CVP-500	Diaphragm	Flattening Vacuum Press	510 x 510 (Option 510 x 610)
Manual	V-130	Diaphragm	-	350 x 350 (Option 400 x 400)
	V-160	Diaphragm	-	610 x 610

Auto type / CV-300

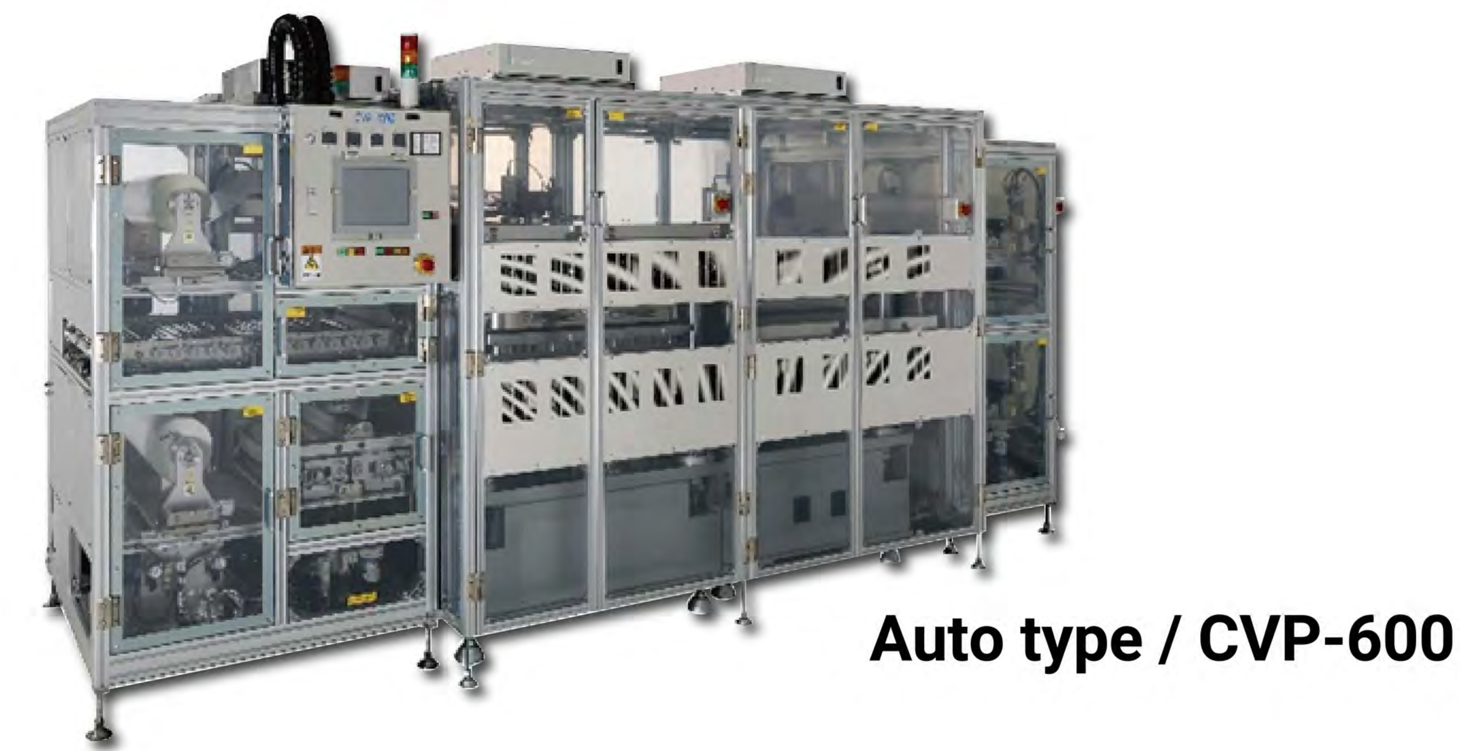
Auto type / CVP-300

Manual type / V-160

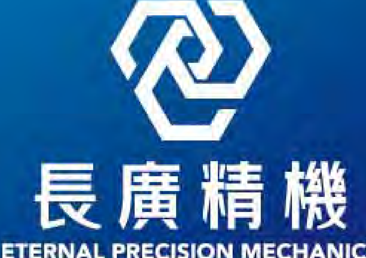
橡膠壓台式真空壓膜機產品系列

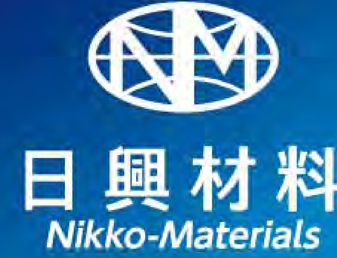
Rubber Press Type Vacuum Laminator Line-Up

Type	Model	1st Stage (Vacuum Laminator)	2nd Stage (Flattening)	Applicable Work-Size(mm)
Auto	CV-600/700	Rubber Press	-	510 x 510 (Option 510 x 610)
	CV-600T/700T	Rubber Press	-	350 x 350
	CVP-600	Rubber Press	Flattening Press	510 x 510 (Option 510 x 610)
	CVP-600T	Rubber Press	Flattening Press	350 x 350
	CVP-700	Rubber Press	Flattening Vacuum Press	510 x 510 (Option 510 x 610)



Auto type / CVP-600





Dry Film Photoresist
負型水溶性乾膜光阻

負型水溶性乾膜光阻主要應用於印刷電路板、導線架、IC基板、IC封裝等精密蝕刻、電鍍等工業之影像轉移製程。藉由堅強研發團隊，長興並可配合客戶之特殊應用及需求，進行產品設計生產，例如電鑄、化學精密蝕刻 (Chemical Milling) 等工業。

Dry film photoresist is the key component used in the image transfer process. It is widely used in precision etching and electroplating products such as Printed Circuit Board (including Rigid board, Flexible board, Rigid /Flexible composite board, and HDI), Lead Frame, IC Substrates, IC packaging, etc. With strong in-house R&D capabilities, we are able to design and develop dry film products to specifically match our customers' requirements for various processes such as Chemical Milling, Electroforming, etc.

Dry Film Solder Mask (DFSM)
乾膜防焊光阻

高精密度綠色乾膜感光弱鹼顯像型光阻，應用於高精密度金屬基板/陶瓷基板/玻璃基板外層線路保護 (Solder Mask)，可適用於真空壓合或熱壓合製程 (roll to roll)，具有優良的耐熱性、高解析能力及較寬的操作範圍。

The DFSM is an alkaline processable green photosensitive film used for the high accuracy metal substrate / ceramic substrate / glass substrate to protect wiring (Permanent Solder Mask), and be easily applicable to vacuum lamination or hot roll to roll laminator process. The DFSM has excellent heat resistance, high resolution and wide operating range.

Liquid UV Curable Marking Ink
液態文字油墨

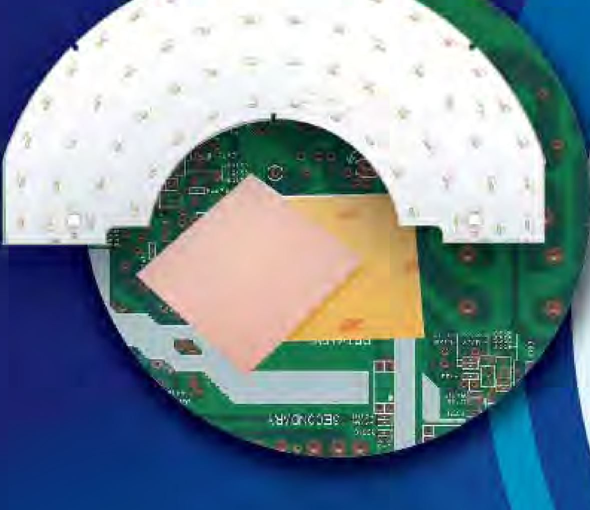
印刷電路板的文字及圖形標示印刷。UV硬化型文字油墨屬於網板印刷製程，適用於雙面及多層印刷電路板的文字及圖形標示印刷，油墨硬化後具優異之附著力、耐熱性。

UV curable marking ink applicable to printing marking and graphics on double face and multiple layer PCB. UV curable marking ink of screen printing property with high resolution. The coating cured ink features excellent adherence and heat resistance.

Photo-Imageable - Coverlay (PIC)
感光型覆蓋膜

低溫150℃烘烤型的高精密度乾膜感光弱鹼顯像型光阻，應用於高精密度軟性印刷電路板(FPC)/金屬基板外層線路保護。

The photo-imageable coverlay could protect outer layer circuit applied to the high accuracy Flexible Print Circuit (FPC) and metal substrate.



Copper Clad Laminate
銅箔基板

銅箔基板(硬板)依製程技術及產品應用主要分為FR-1、CEM-1、CEM-3、FR-4，一般應用於民生家電、資訊周邊產品與相關通訊電子產品上，如液晶顯示器、LED及傳統照明等驅動電源板。

Copper Clad Laminate (Rigid boards) are mainly divided into FR-1, CEM-1, CEM-3 and FR-4 according to process technology and product applications. They are generally used in home appliances, information peripheral products and related communication electronic products, such as LCD monitors, LEDs and traditional lighting drive power supply boards.

Vacuum Laminator
真空壓膜機

真空壓膜機包含全自動機、半自動機與依客戶需求設計之客製機。真空壓膜機以獨家傳送膜搬運技術與真空壓膜膜組，整合熱壓系統等附屬設備一體化，以提高生產效率。應用於IC封裝用載板外，亦適用於PCB/FPC/LED/半導體等相關製程應用。

Vacuum Laminator can be Semi-Automatic, Automatic or Customized. Vacuum Laminator is developed by applying the original carrier film system technology and the high-precision hot press system technology, which can be increased production efficiency.

Its main application is IC substrate industry, other applications include the related manufacturing processes of PCB / FPC and LED / Semiconductor industry.

Toll Coating Service
精密塗佈代工

塗佈產品跨及各產業，塗佈產能佈局全球。多元化Roll to Roll塗佈設備暨豐富代工經驗，提供全方位塗佈代工服務，滿足各類塗佈產品所需製程需求。

Eternal Toll Coating Service has spanned across various industries and conducted around the world. We offer the diversified Roll to Roll coating equipments and techniques with adequate proven services to meet any product coating requirements by our customers.