ETERNAL MATERIALS PRODUCT LIST

長興材料
ETERNAL MATERIALS

Application	Series	Thickness (μm)	Process
Multi Layer	E7700	29	Tent & Etch, Plating
	E9400DI	38, 49	
	HT100TDI	38, 49	
	LIP600F	30, 40	
HDI	UDF3200F	30	Tent & Etch
	UDF3100F	27	
	LIP2100	25, 29, 40	
	UDH5400	15, 25	SLP
FPC	HT2600	30	Tent & Etch
	APR500	20, 25	
	502J	15, 20, 25, 30	
IC Substrate & PKG	UDH5600	15, 25, 30	mSAP, SAP
	LDF500F	15, 25, 29	
	LDF700	25, 45	
	BR42000	80, 120	Copper Pillar Bumping

ETERTEC® E7700

For MLB

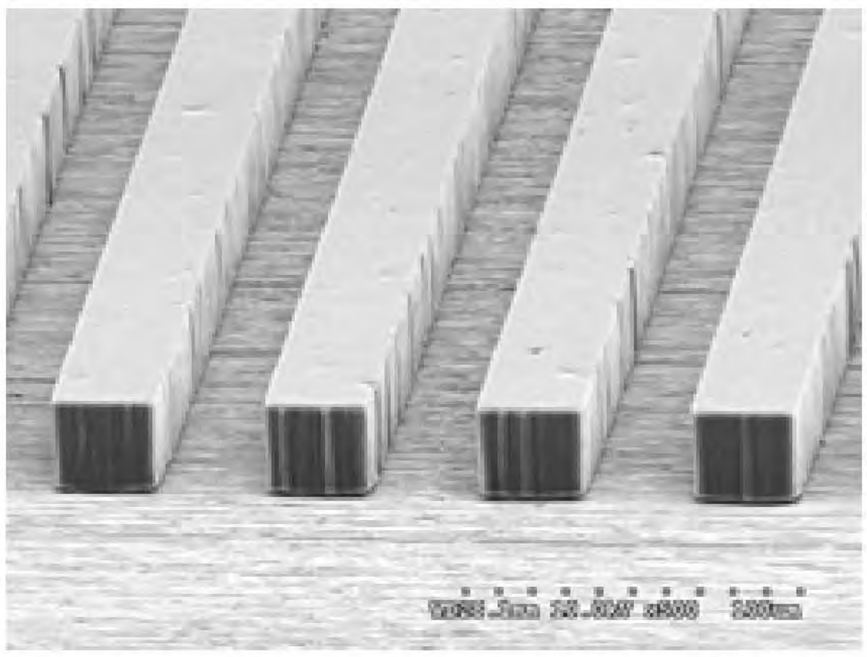
DRY FILM PHOTORESIST

FEATURES

- High throughput
- Broad processing latitude in each process step
- Designed for universal applications
- Good tenting behavior & chemical resistance
- Excellent high resolution and adhesion
- Easily stripping

特性

- 高產能
- 於各製程段有較廣操作區間
- 針對全方位製程能力設計
- 優良蓋孔與抗化性能力
- 優良線路解析度及附著力
- 去膜容易



E7712 19/41sst L/S=30 μm/30 μm

CHARACTERISTICS

Item	E7712
Thickness (μm)	29
Exposure Energy (mj/cm^2) *1	30
41 STOUFFER STEP HELD	16
Minimum Developing Time x2 (sec) *2	31
Adhesion (μm) *2	16
Resolution (μm) *2	20
Stripping Break Time (sec) *3	28

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

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

LAMINAR® E9400DI

SEMI -LDI

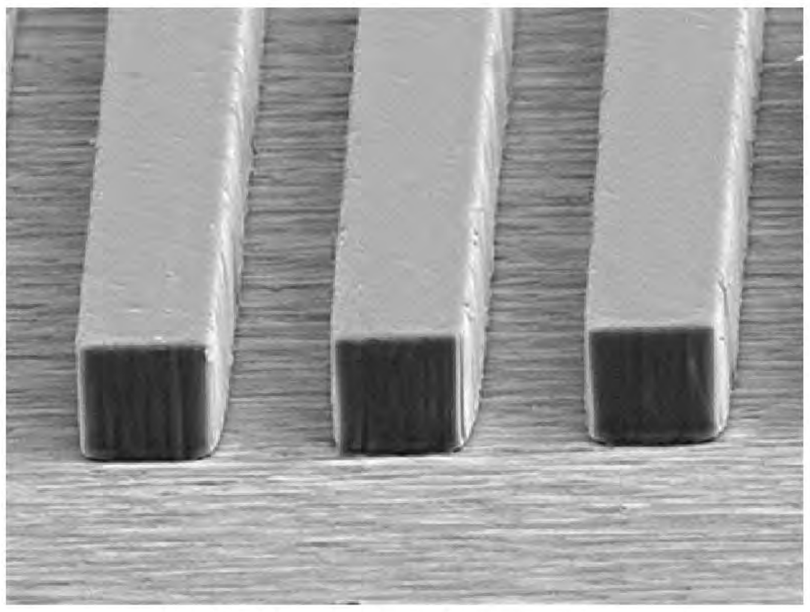
SEMI-LDI DRY FILM PHOTORESIST

FEATURES

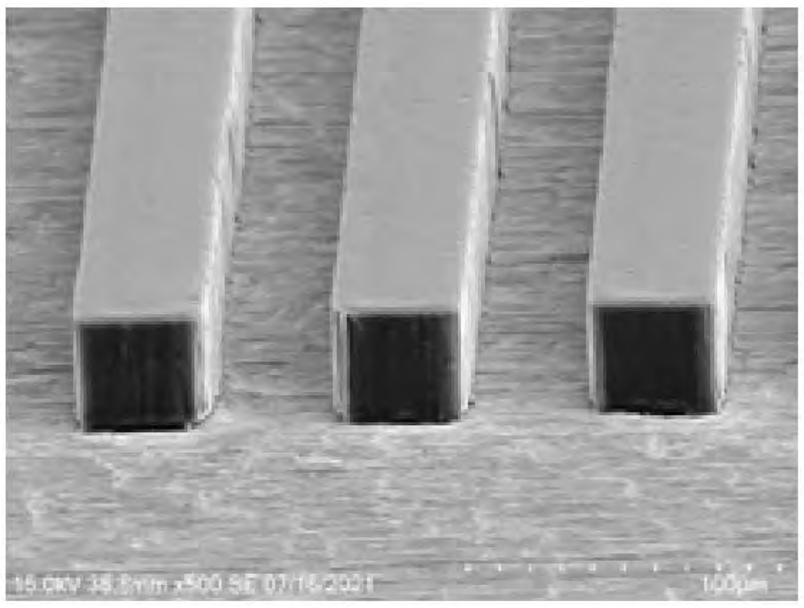
- Designed for conventional and DI/LDI exposure system applications
- For conventional exposure system, i-line and h-line
- Excellent tenting ability
- Excellent resistance to plating
- Excellent high resolution and adhesion

特性

- 可同時於傳統曝光和雷射曝光製程設計
- 適用於傳統曝光與DI/LDI i-line與h-line波長
- 優良蓋孔能力
- 優良抗電鍍能力
- 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.

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® HT100TDI

SEMI -LDI

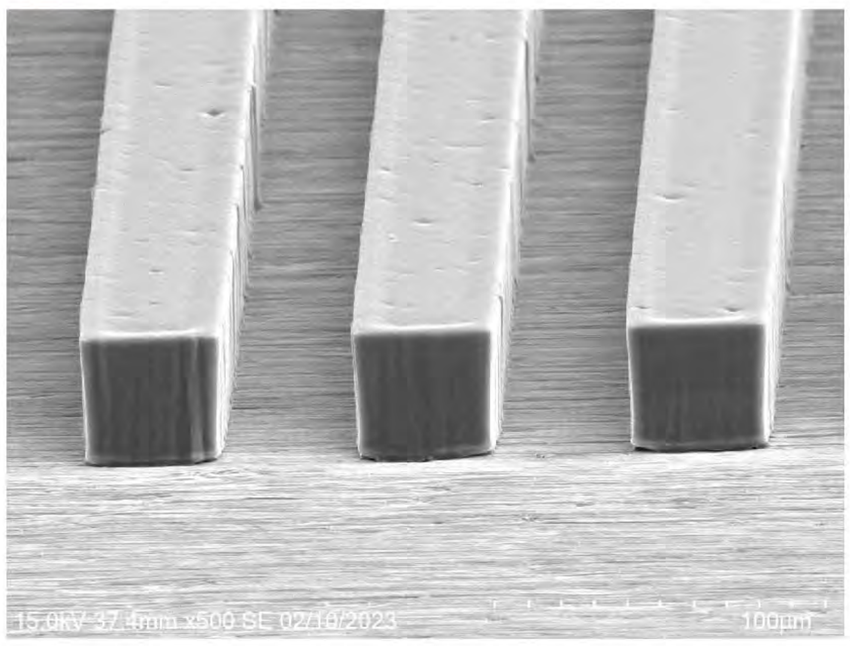
SEMI-LDI DRY FILM PHOTORESIST

FEATURES

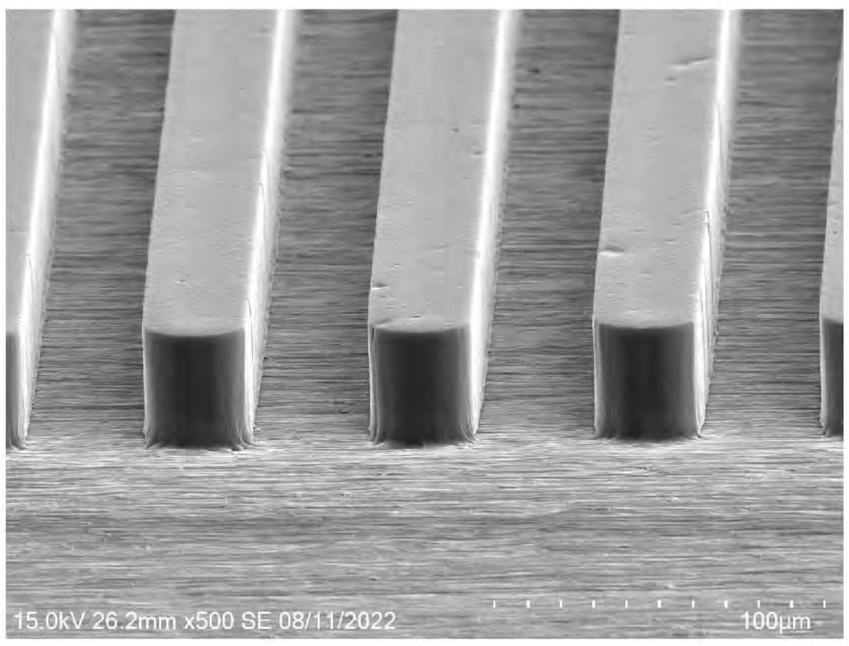
- Designed for UV laser and Collimated light applications
- For conventional exposure system and DI exposure machine
- Excellent tenting ability
- Excellent high resolution and adhesion

特性

- 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

For HDI

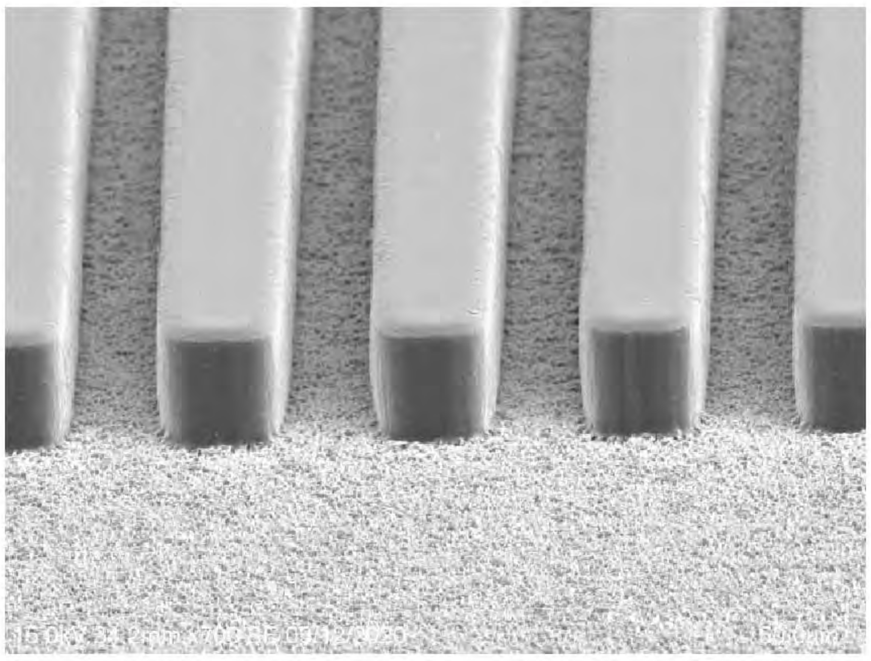
LDI DRY FILM PHOTORESIST

FEATURES

- Designed for UV laser direct imaging applications
- For i-line and h-line
- Excellent tenting ability
- Excellent high resolution and adhesion

特性

- 針對雷射曝光製程設計
- 適用**i-line**與**h-line**波長
- 優良蓋孔能力
- 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

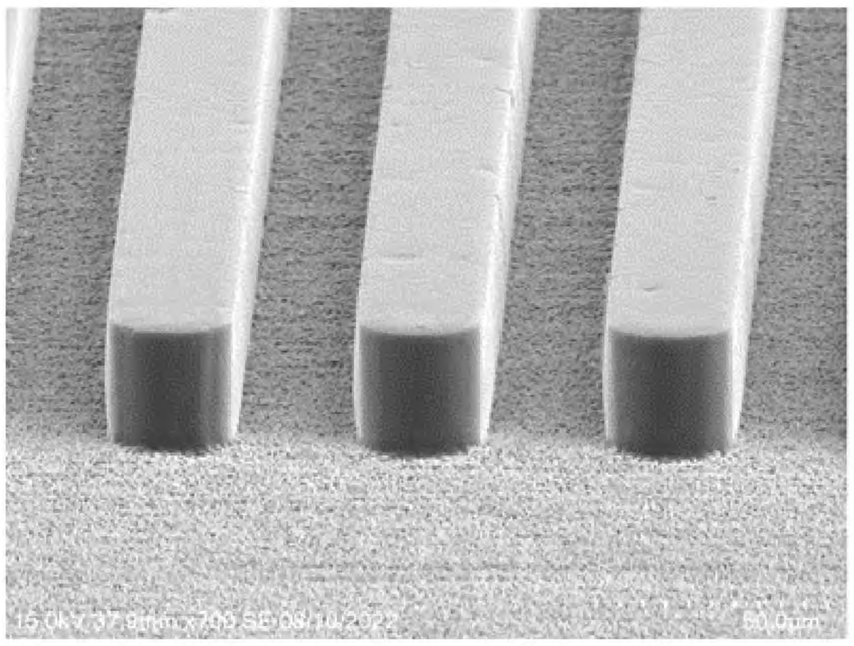
LDI DRY FILM PHOTORESIST

FEATURES

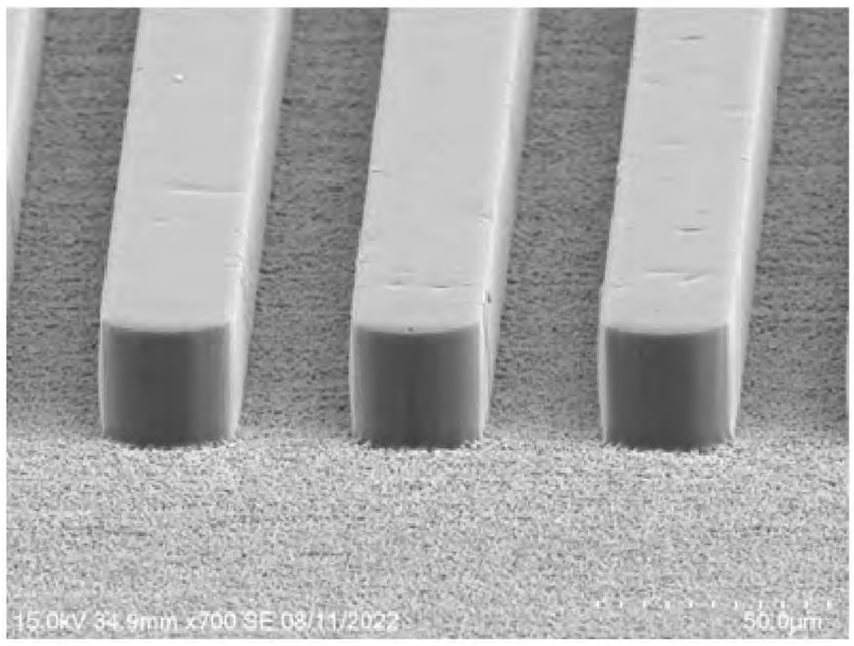
- Designed for UV laser direct imaging applications
- For i-line and h-line
- Excellent tenting ability
- Excellent high resolution and adhesion

特性

- 針對雷射曝光製程設計
- 適用 i-line & h-line波長
- 優良蓋孔能力
- 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

HDI/FPC用途 ALPHO® LIP2100シリーズ
For HDI and FPC process ALPHO® LIP2100 series

for LDI

特長 Features

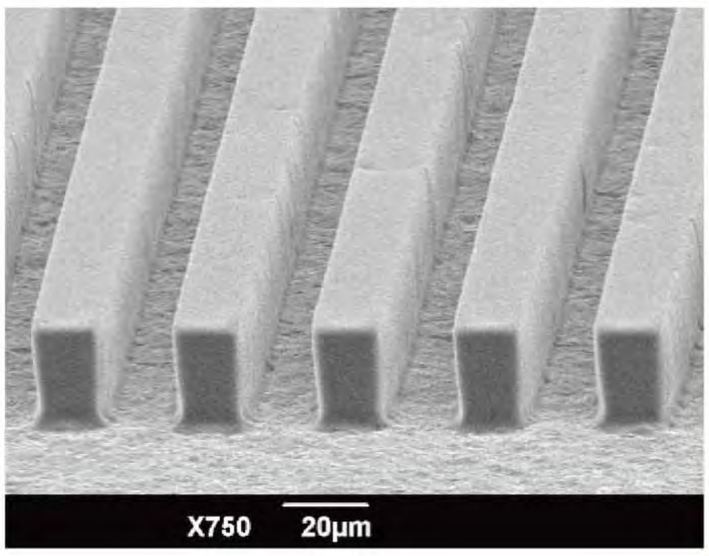
- HDI/FPC回路形成に適したドライフィルムフォトレジストです。高感度、高解像、低発泡により良好な回路形成を形成します。
  It is Dry Film Photo Resist suitable for HDI and FPC process.
  Realizing high photosensitivity, high resolution and low foaming performance for etching process.

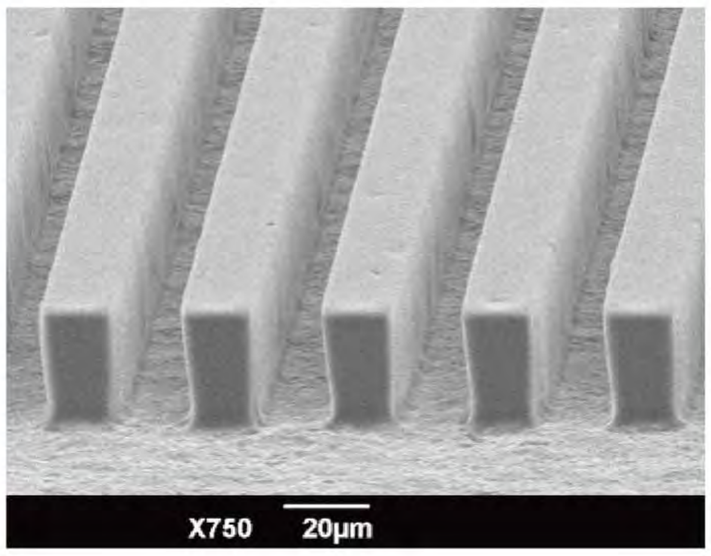
レジスト特性 Resist performance

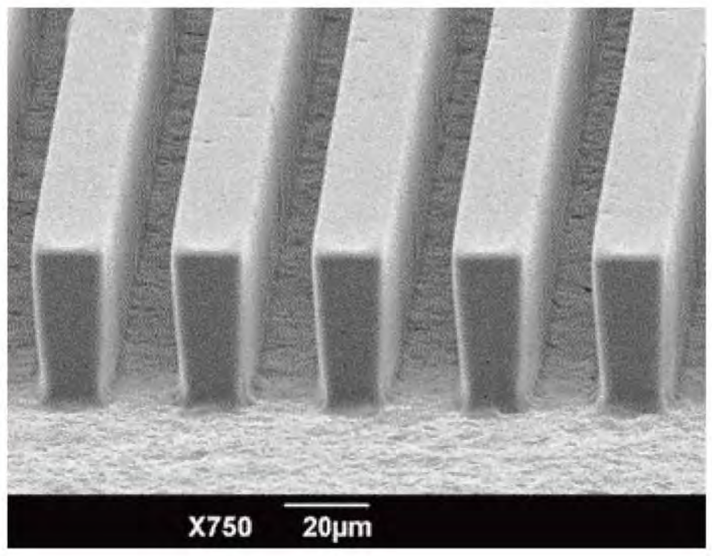
Dry film	LIP2125	LIP2129	LIP2140
レジスト厚 Resist Thickness（μm）	25	29	40
最小現像時間※1 Minimum Developing Time（sec.）	18	21	27
露光量※2 Exposure Energy（mJ/cm²）	21	24	35
解像密着性 Resolution and Adhesion L/S=x/x（μm）	17	17	17
細線密着性 Adhesion L/S=x/9x（μm）	15	17	22

※1 現像条件（Developing condition）：1.0%Na_2CO_3, 30℃, BP x 2
※2 DI露光（Direct imaging exposure）：オーク製作所h線DI（ORC h-line）

LIP2125 L/S=17/17μm	LIP2129 L/S=17/17μm	LIP2140 L/S=17/17μm







長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® UDH5400

For MSAP

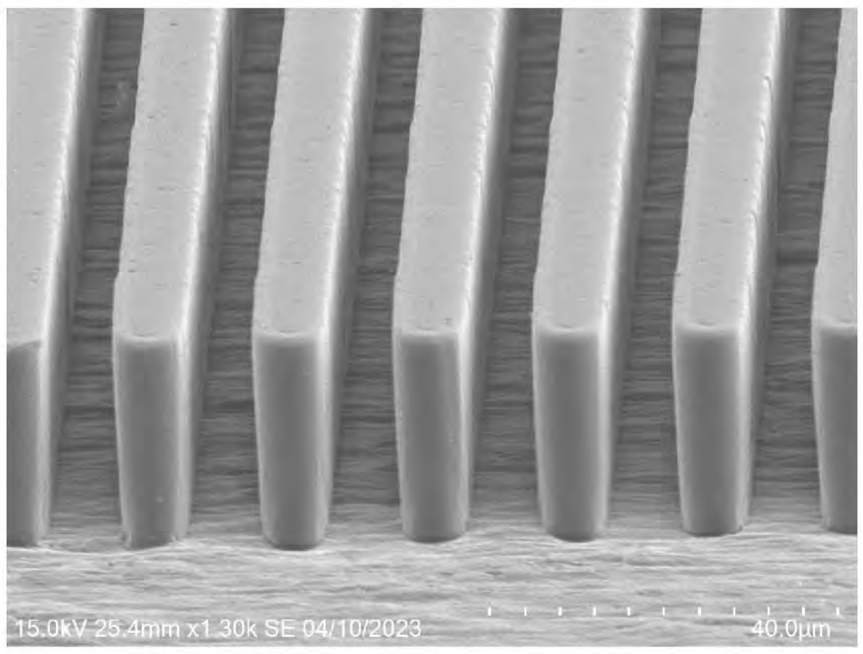
LDI DRY FILM PHOTORESIST

FEATURES

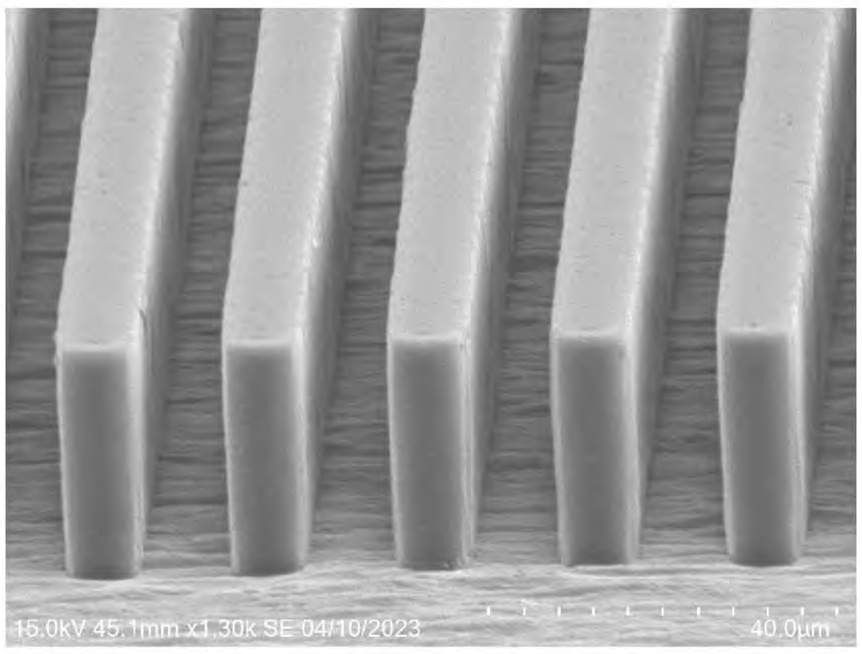
- Designed for UV laser direct imaging applications
- For i-line & h-line
- For pitch 40μm
- Excellent chemical resistance
- Excellent resolution and adhesion

特性

- 針對雷射曝光製程設計
- 適用i-line & h-line
- 可用pitch 40μm
- 優良抗化性
- 優良線路解析度及附著力



UDH5425 16/41sst L/S= 8 μm/8 μm



UDH5425 19/41sst L/S= 9 μm/9 μm

CHARACTERISTICS

Item	UDH5425	
Thickness (μm)	24	
Exposure Energy (mj/cm^2) *1	55	80
41 STOUFFER STEP HELD	16	19
Minimum Developing Time x2 (sec)*2	38	
Adhesion (μm)*2	8	
Resolution (μm)*2	8	9
Stripping Break Time (sec)*3	34	37

*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® HT2600

For FPC

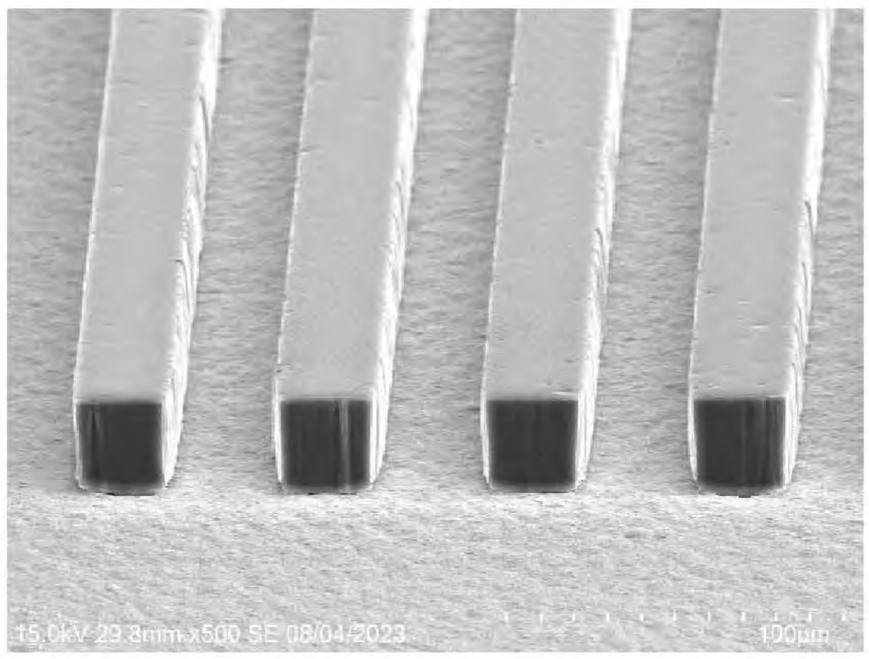
DRY FILM PHOTORESIST

FEATURES

- High throughput
- Broad processing latitude in each process step
- Designed for FPC applications
- Good tenting behavior characteristic
- Excellent high resolution and adhesion
- Easily stripping with small flake size

特性

- 高產能
- 於各製程段有較廣操作區間
- 針對FPC製程設計
- 優良蓋孔能力
- 優良線路解析度及附著力
- 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

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® APR500

For FPC

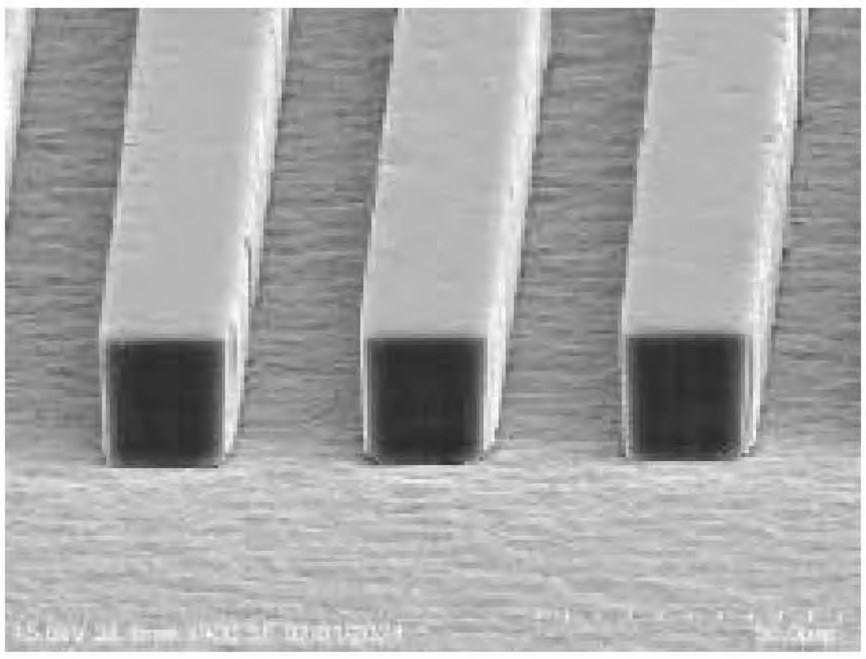
DRY FILM PHOTORESIST

FEATURES

- Designed for FPC applications
- Excellent tent ability & flexibility
- Excellent high resolution and adhesion
- Easily stripping/ break flake size

特性

- 針對FPC製程設計
- 優良蓋孔能力和撓折性
- 優良線路解析度及附著力
- 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/cm^2) *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

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

FPC回路形成用途 ALPHO® 502Jシリーズ
For FPC patterning process ALPHO® 502J series

For Contact

特長 Features

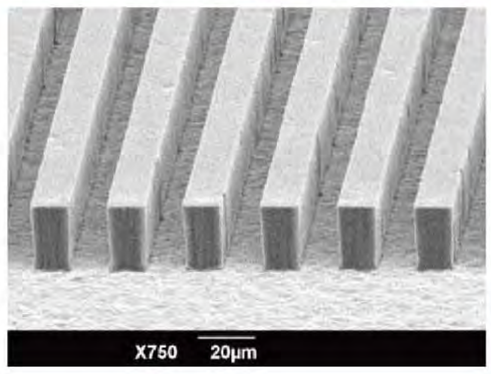
- FPCの回路形成プロセスに適合するドライフィルムフォトレジストです。高解像、易剥離、良好なテンティング性能、低スカム量によりファインピッチ品の量産をサポートします。
  It is Dry Film Photo-resist suitable for FPC patterning process. Realizing high resolution/adhesion, easy stripping, good tenting performance and low sludge/scum amount. Contribution to mass production for Fine pitch is expected.
- 真空Roll to Roll プロセスに適応した製品です。
  It is applicable for vacuum Roll to Roll process.

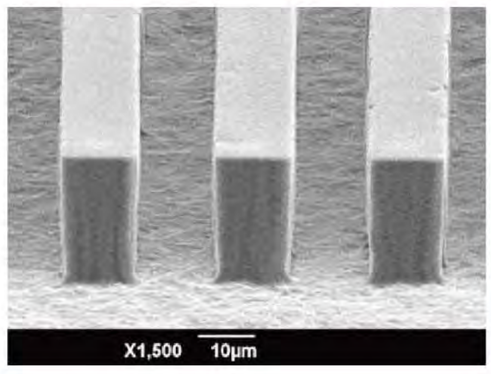
レジスト特性 Resist Performance

Dry film	502J25	502J30
レジスト厚 Resist Thickness（μm）	25	30
露光量※1 Exposure Energy（mJ/cm²）	70	70
解像密着性※2 Resolution and Adhesion L/S =x/x（μm）	14	14
細線密着性※2 Fine Line Adhesion L/S =x/400（μm）	14	16
剥離時間※3 Stripping Time（sec.）	30	36

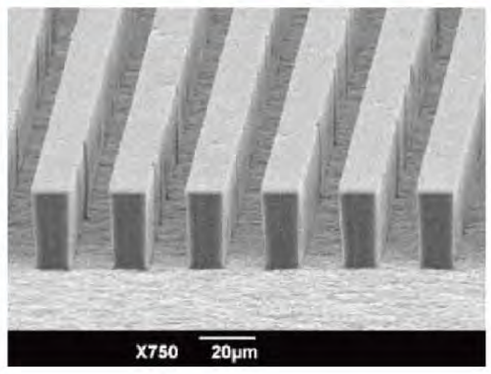
※1 コンタクト露光（Collimated light exposure）
※2 現像条件（Developing condition）: 1.0%Na_2CO_3, 30℃, 0.20MPa, BP x 2
※3 剥離条件（Stripping condition）: 50℃, 3%NaOHaq.

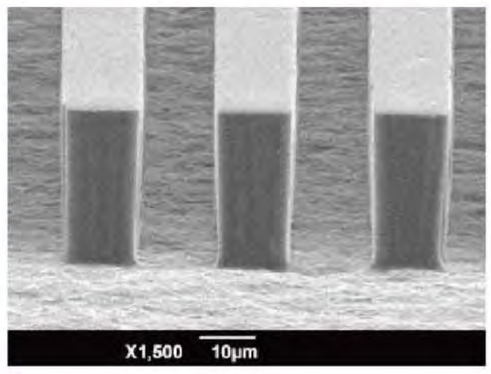
502J25 L/S=14/14μm



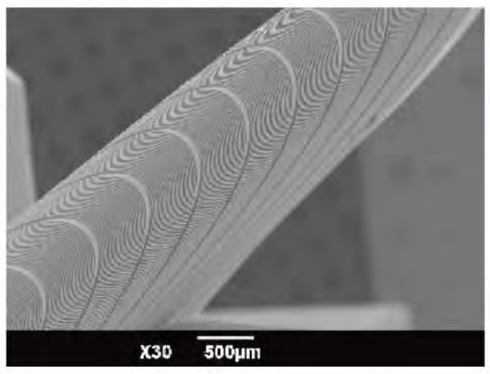


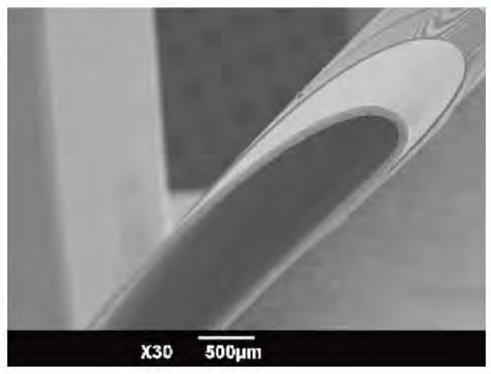
502J30 L/S=14/14μm

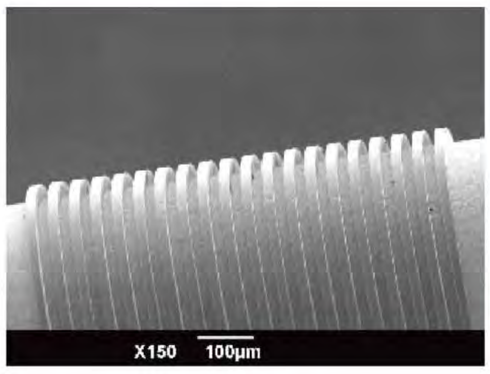


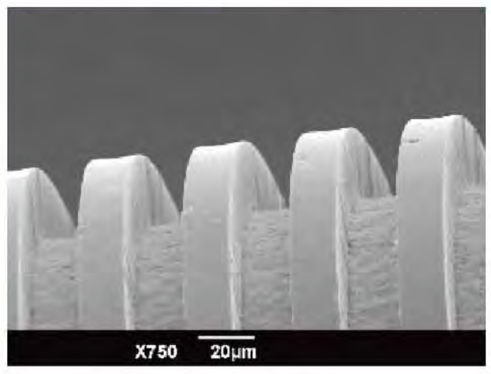


502J30 Folding L/S=20/20μm









長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® UDH5600

For SAP /mSAP

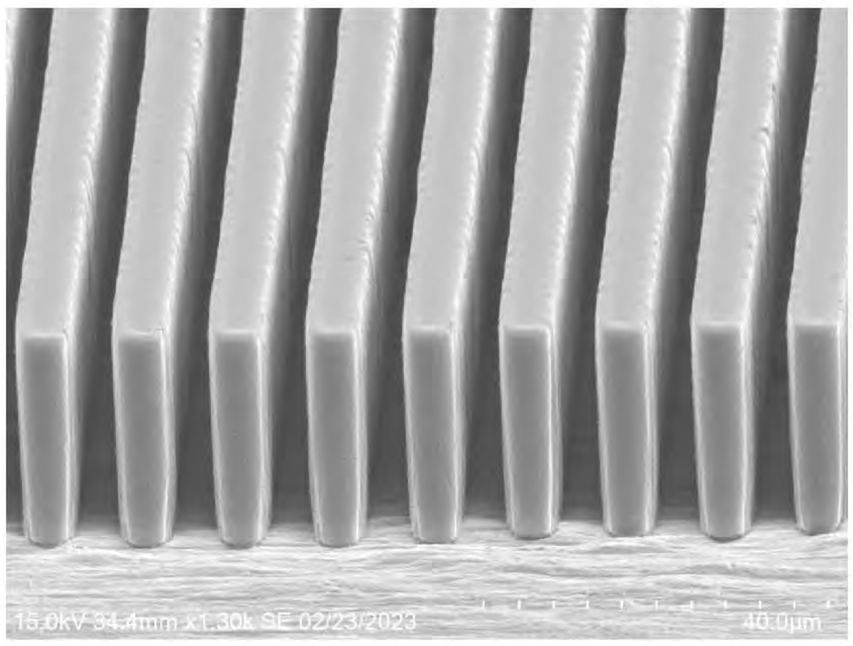
LDI DRY FILM PHOTORESIST

FEATURES

- Designed for UV laser direct imaging applications
- For i-line & h-line
- For SAP/mSAP
- Excellent chemical resistance
- Excellent resolution and adhesion

特性

- 針對雷射曝光製程設計
- 適用 i-line & h-line
- 可用 SAP/mSAP
- 優良抗化性
- 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.

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

SAP/mSAP用途 ALPHO® LDF700シリーズ
For SAP/mSAP process ALPHO® LDF700 series

for LDI

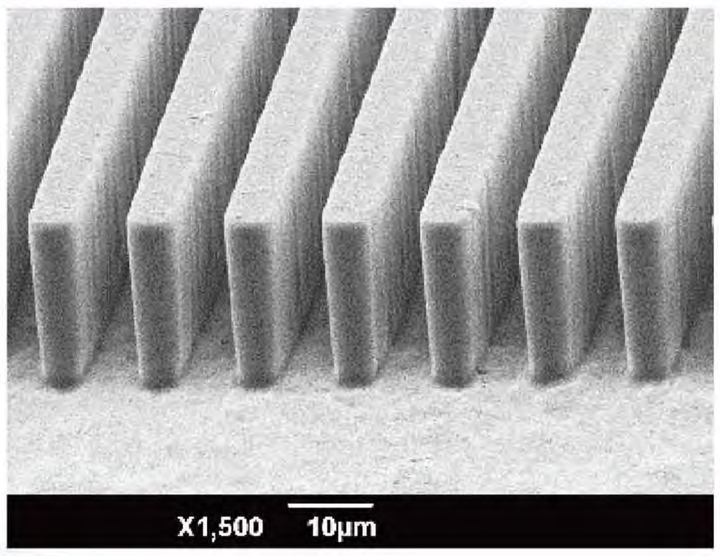
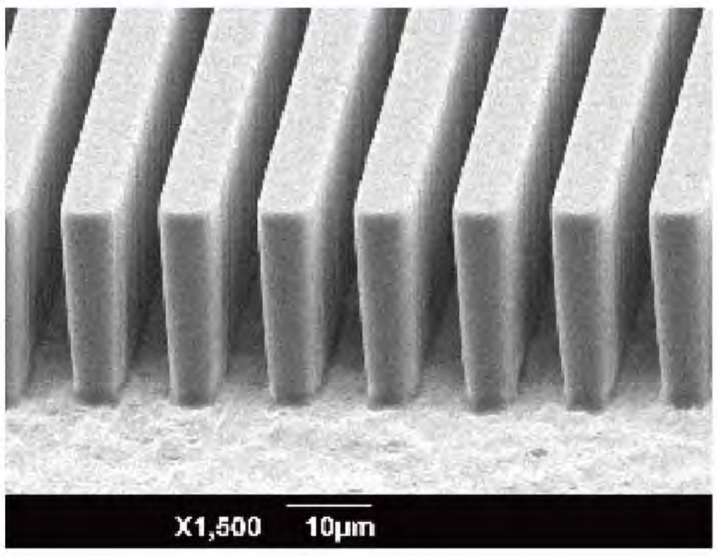
特長 Features

- 半導体パッケージ用サブストレートの配線形成に適したh線DI露光に対応した高解像ドライフィルムフォトレジストです。
  High resolution Dry Film Photoresist suitable for patterning of IC Package substrate. Designed for h-line direct imaging exposure machine.
- 良好な剥離性及び柔軟性を有しているため、めっき潜り及びめっき後のレジスト残渣低減に優れています。
  LDF700 has good stripping ability and flexibility so it has excellent performance for reduction of under plating and resist residue.

レジスト特性 Resist Performance

Dry film	LDF720	LDF725
レジスト厚 Resist Thickness（μm）	20	25
最少現像時間※1 Minimum Developing Time（sec.）	13	18
露光量※2 Exposure Energy（mJ/cm²）	60	60
ステップ段数 Photosensitivity（41SST）	14	14
解像密着性 Resolution and Adhesion（L/S =x/x, μm）	6	6
細線密着性 Fine Line Adhesion（L/S =x/9x, μm）	6	6
剥離時間※3 Stripping Time（sec.）	15	22
剥離片サイズ※3 Stripping Flake Size（mm）	<5	<5

※1 現像条件（Developing condition）：1.0% Na_2CO_3, 30℃, 0.15MPa, BP x 2
※2 DI露光（Direct imaging exposure）：オーク製作所製 FDiシリーズ（ORC FDi series）, Post exposure bake: 60℃, 30sec
※3 剥離条件（Stripping condition）：50℃, Amine type, Dipping test, Pattern size 50×66mm

LDF720 L/S=6/6μm	LDF725 L/S=6/6μm
	

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® BR42000

Advanced Package

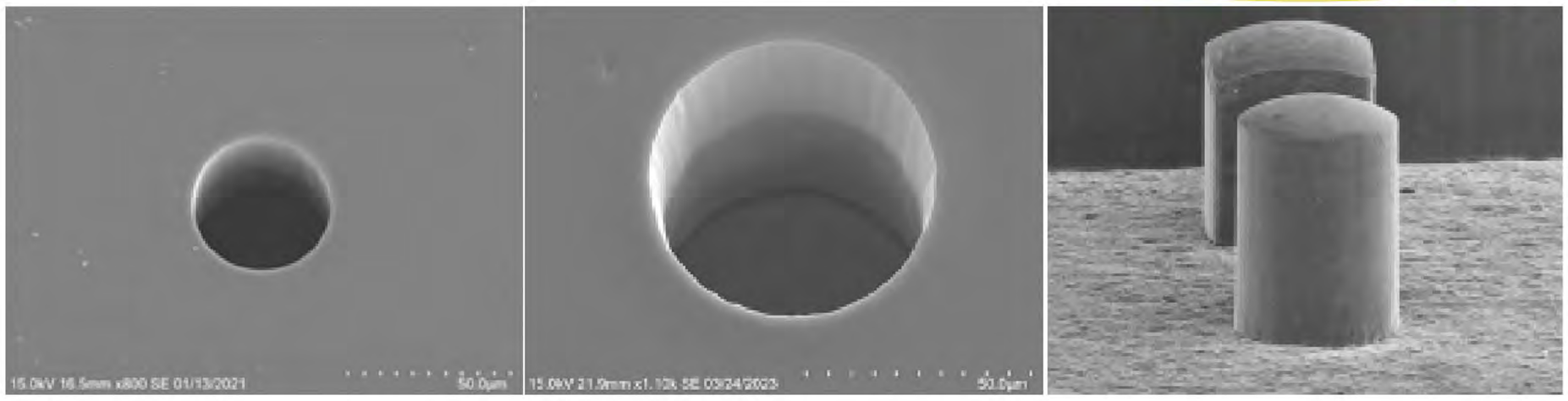
DRY FILM PHOTORESIST

FEATURES

- High resolution, high aspect ratio
- Excellent adhesion
- Copper pillar bump for semiconductor package
- Easy to Strip

特性

- 極佳線路解析度與深寬比
- 極佳線路附著力
- 適用於半導體封裝銅柱凸塊
- 去膜容易



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

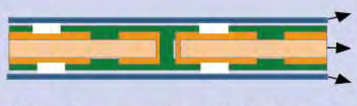
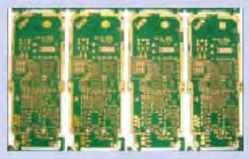
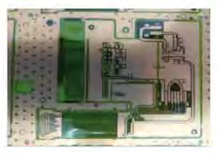
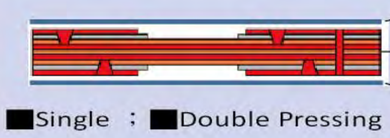
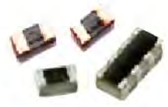
EFV-1000 VACUUM LAMINATOR
真空壓膜機

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

日本Nikko-Materials Co., Ltd. 設計

Applications 應用

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

長廣精機
ETERNAL PRECISION MECHANICS

ETERNAL MATERIALS

Your Solution Provider

長興材料

長廣精機

日興材料

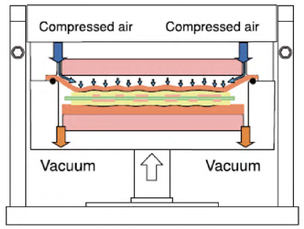
日興材料 氣囊式真空壓膜機
Nikko-Materials Diaphragm Vacuum Laminators

何謂氣囊式壓膜？
What is Diaphragm Lamination?

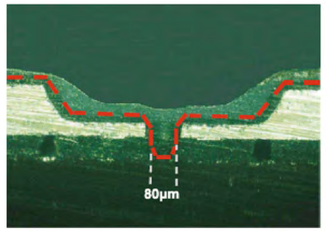
氣囊式壓膜是指通過矽橡膠的彈性變化，實現對板面凹凸、段差等的填附，並通過抽取板材與膜材料之間的空氣， 真空下消除氣泡並使膜材料與板材貼合。
採用氣壓和橡膠的方式，相較於液壓做動方式更為柔和，可適用於易碎、極薄的晶片等材料。

Diaphragm Lamination is to laminate with silicon rubber.
- Rubber fits uneven substrate surface, Vacuum function removes air between substrate and film, which facilitates void-free lamination.
- By using air and rubber, able to laminate soft and gently in comparison to hydraulic -powered press.

The Diaphragm type suits for various materials including fragile thin wafers.



抽真空後，從上部供給高壓空氣，從而使矽橡膠膨脹延伸、向下加壓，使膜材料與板材貼合。
Compressed air supplied to upper plate.
Upper silicon rubber of diaphragm stretches downward and presses substrate with films.



對細線路、大間距段差的填附能力卓越。
Excellent conformation is guaranteed not just for fine Pattern, but for the big gap like above as well.

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 x610
	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 x510 (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

日興材料 橡膠壓台式真空壓膜機
Nikko-Materials Rubber Press Vacuum Laminators

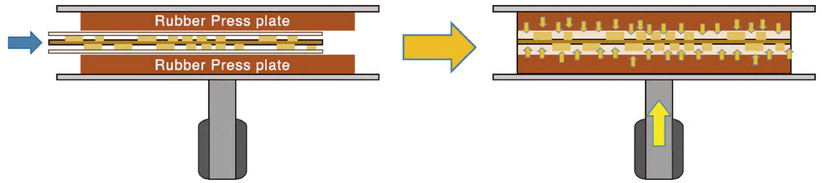
何謂橡膠壓台式壓膜？
What is Rubber Press Lamination?

橡膠壓台式壓膜是指在垂直方向施加高壓，通過橡膠台面的彈性變化，讓膜材料貼着板材的凹凸變化進行壓合。在第二段進行樹酯材料表面的平整性處理。適合自動化生產作業，相較傳統多段式真空壓合生產效率更高。

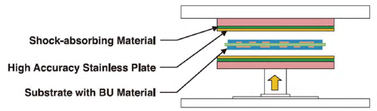
Rubber Press Lamination is to laminate with high pressure in vertical direction.
- 1st stage /Elastic rubber press plate fits uneven substrate and conforms film.
- 2nd stage /SUS plate press does Resin flattening.

Rubber press laminator is suitable for automation. The production efficiency is much better than Multiple pressing equipment.

1st 設備抽真空並透過橡膠壓台使膜材料填附板材凹凸表面。
1st Rubber Press removes air and conforms resin film to uneven surface substrate.



2nd 平整段實現樹脂表面的平坦性。
2nd Flattening Press finishes resin surface flat.



Data of Resin Thickness (example)

Machine Type	Rubber Press	Diaphragm
Average thickness	37.8 μm	33.9 μm
Maximum thickness	39.0	36.4
Minimum thickness	36.4	32.1
Standard deviation (3σ)	2.6	4.2

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 x510 (Option 510 x610)
	CVP-600T	Rubber Press	Flattening Press	350 x 350
	CVP-700	Rubber Press	Flattening Vacuum Press	510 x510 (Option 510 x 610)

Auto type /CVP-600