長興材料

ETERNAL MATERIALS

Photoresist Materials Division

ETERNAL DRY FILM PHOTORESIST PRODUCT LIST

Series	Thickness(um)	Process & Application	Remark
E7700	29	Etching, Tenting, Plating	
E7700M	49, 66	ENIG, Alkaline Etching Gold Plating	
E9300	29	Etching, Tenting, Plating	
E9300M	38	Etching, Tenting, Plating	
E9400	29, 38, 49	Etching, Tenting, Plating	
E9500	33	Etching, Tenting, Plating	
APR400	20	Etching, Tenting, Plating	
APR600	10, 25	Etching, Plating	
APR900	25	Plating	
HT100F	29, 38, 50	Etching, Tenting, Plating	
HT200F	38	Etching, Tenting, Plating	
HT-100T	40, 50	Etching, Tenting, Plating	
HT-300	30	Etching, Plating	
HT-1900	30	Etching, Tenting, Plating	
HT-9600	38	Etching, Tenting, Plating	
HQ-6300	38, 49	Etching, Alkaline Etching Plating, Gold Plating	
GA	75, 100	Bumping	
BR41000	80, 120	Bumping, Cu Pillar	
BR42000	80, 120	Bumping, Cu Pillar	
E9400DI	38, 49	Etching, Tenting, Plating	Design for LDI
HT100TDI	38, 50	Etching, Tenting, Plating	Design for LDI
UDF3100	27, 38	Etching, Tenting	Design for LDI
UDF3200	25, 30	Etching, Tenting	Design for LDI
UDF3200F	30, 35	Etching, Tenting, Plating	Design for LDI
UDF7200E	40, 50	Etching, Tenting, Plating	Design for LDI
UDF7400	30, 38, 49	Etching, Tenting, Plating	Design for LDI
UDF7600	20	Etching, Tenting	Design for LDI
UDH5400	25	Plating	Design for LDI
UDH5500	15, 20	Etching	Design for LDI
UDH5600	25	Plating	Design for LDI
NIT2700	15, 28, 35	Plating	
NIT8100	10, 15, 25	Plating	
502J00	15, 20, 25, 30	Etching, Tenting	
LIP600F	30, 40	Etching, Tenting	Design for LDI
LIP2100	25	Etching, Tenting	Design for LDI
LDF500F	15, 25, 29	Etching, Tenting, Plating	Design for LDI
LDF700	20, 25	Etching, Tenting, Plating	Design for LDI

Photoresist Materials Division

LAMINAR ® E7700M

For ENIG

DRY FILM PHOTORESIST

FEATURES

- Excellent resistance to **ENIG**
- Excellent resistance to **Alkaline etching**
- Excellent tenting ability
- High resolution
- Low developing foaming

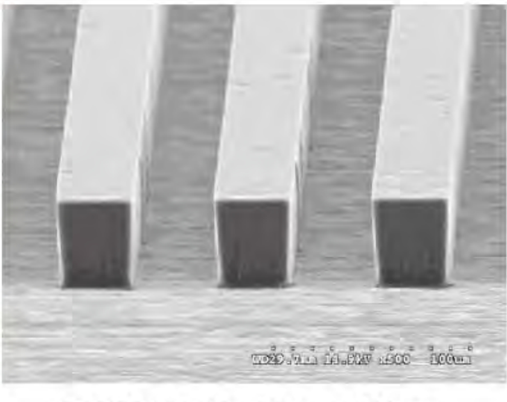
特性

- 對化鎳浸金製程具優良抗化性
- 對鹼性蝕刻製程具優良抗化性
- 蓋孔能力佳
- 線路解析力高
- 顯影泡沫低

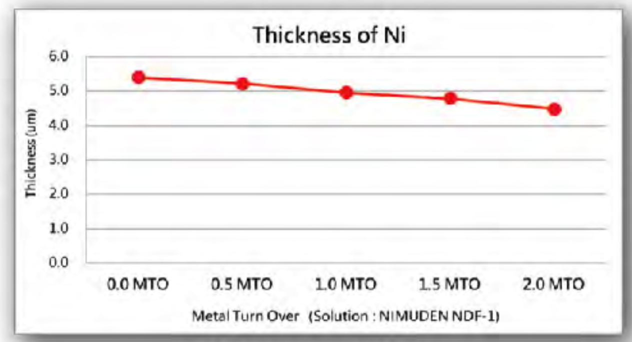
CHARACTERISTICS

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

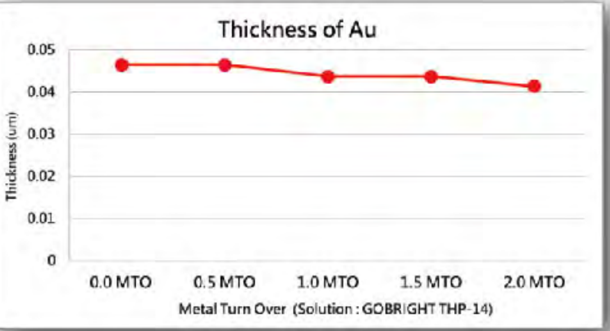
*1: 50 % BP, 28°C *2: 3% NaOH by dipping.



E7720M L/S=40 μm /40 μm



Thickness of Ni



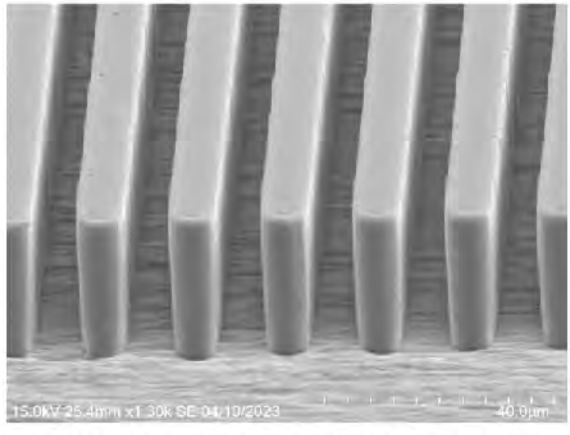
Thickness of Au

ETERTEC® UDH5400

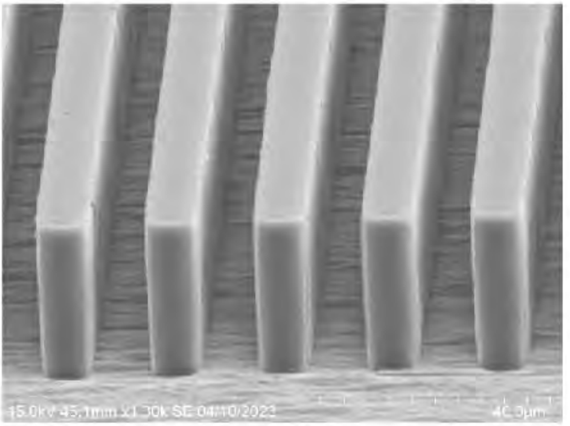
For MSAP

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 pitch 40μm	可用pitch 40μm
Excellent chemical resistance	優良抗化性
Excellent resolution and adhesion	優良線路解析度及附著力



UDH5425 16/41sst L/S= 8μm/8μm



UDH5425 19/41sst L/S= 9μm/9μm

CHARACTERISTICS

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

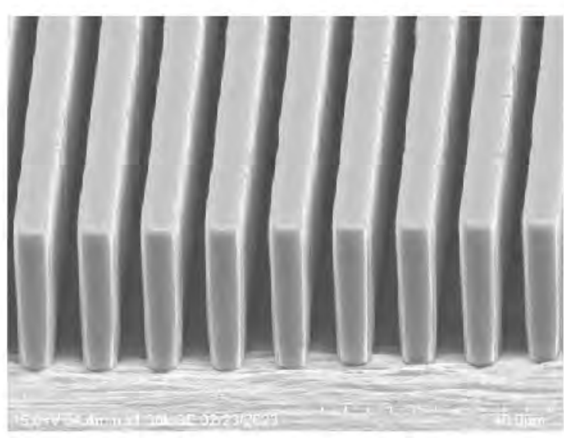
*1:Test by h-line DI machine
*2: 50 % BP, 28℃ *3:3% NaOH by dipping.

ETERTEC® UDH5600

For 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.

長興材料
ETERNAL MATERIALS

Photoresist Materials Division

ETERTEC® UDF3200F

For LDI

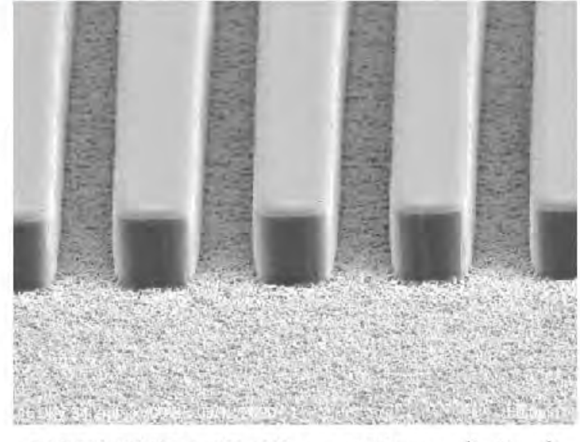
LDI DRY FILM PHOTORESIST

FEATURES

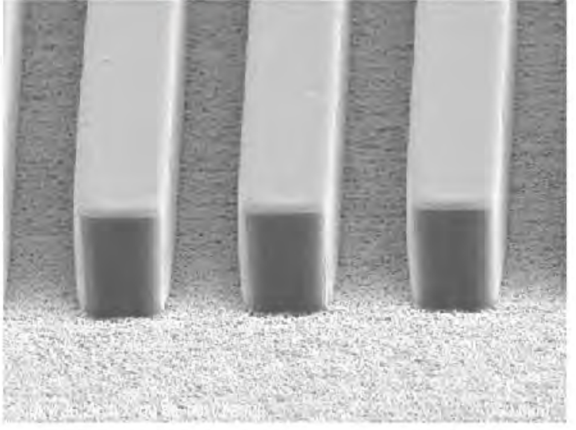
- Designed for UV laser direct imaging applications
- For i-line and h-line
- Excellent tenting ability
- Excellent high resolution and adhesion

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)



UDF3235F L/S=24 μm/24 μm (h-line)

CHARACTERISTICS

Item	UDF3230F		UDF3235F	
Thickness (μm)	29		35	
Wavelength	i-line	h-line	i-line	h-line
Exposure Energy (mj/cm^2) *1	11	13	17	13
41 STOUFFER STEP HELD	19	19	22	19
Minimum Developing Time x2 (sec)*2	33	33	43	43
Adhesion (μm)*2	24	20	26	24
Resolution (μm)*2	24	22	26	24
Tent breakdown (via Φ 5.5 mm)	0		0	

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

ETERTEC® UDF7200E

For LDI

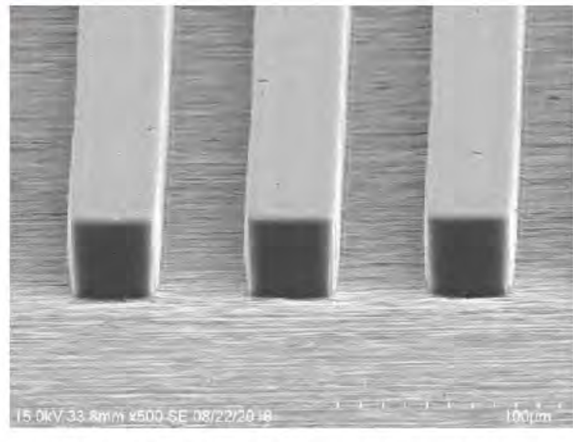
LDI DRY FILM PHOTORESIST

FEATURES

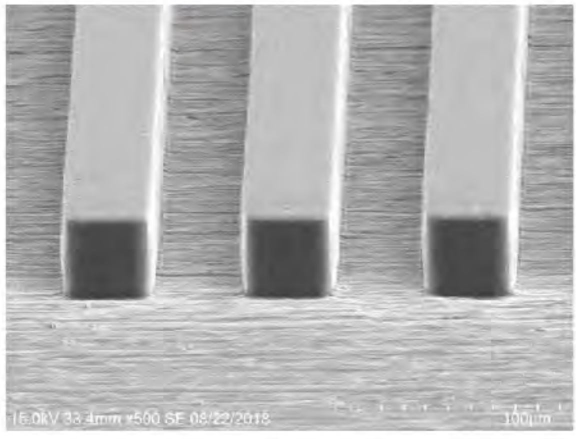
- Designed for UV laser direct imaging applications
- For i-line and h-line
- Excellent tenting ability
- Excellent high resolution and adhesion

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



UDF7240E L/S=40 μm/40 μm(i-line)



UDF7240E L/S=40 μm/40 μm(h-line)

CHARACTERISTICS

Item	UDF7240E		UDF7250E	
Thickness (μm)	38		49	
Exposure Wavelength	i-line	h-line	i-line	h-line
Exposure Energy (mj/cm^2) *1	12	16	17	28
41 STOUFFER STEP HELD	19	19	22	22
Minimum Developing Time x2 (sec) *2	43	43	58	58
Adhesion (μm) *2	32	32	34	34
Resolution (μm) *2	32	32	36	36
Tent breakdown (via Φ 5.5 mm)	0		0	
Stripping Break Time (sec) *3	55		65	

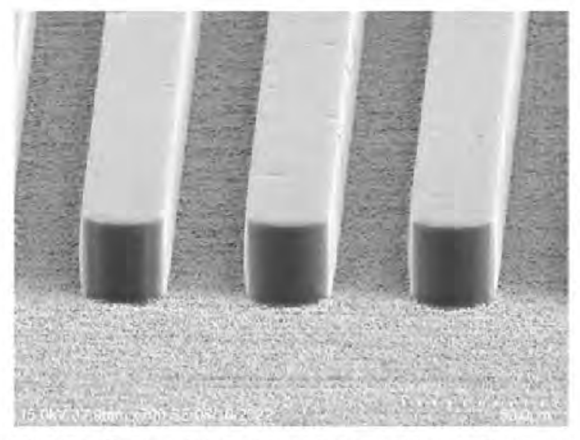
*1:Test by Orbotech Nuvogo800 *2: 50 % BP, 28°C *3: 3% NaOH by dipping.

ETERTEC® UDF3100F

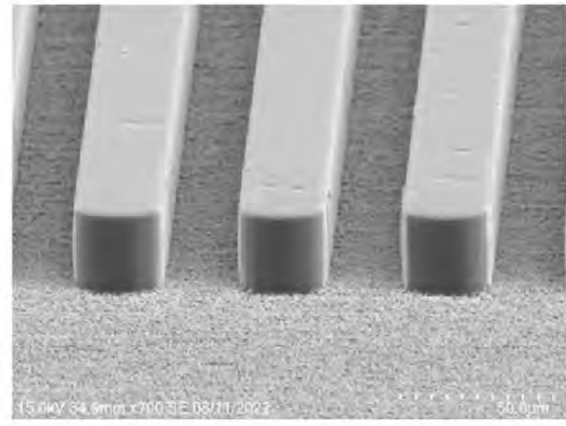
HDI

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=22μm/22μm

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® BR42000

Advanced Package

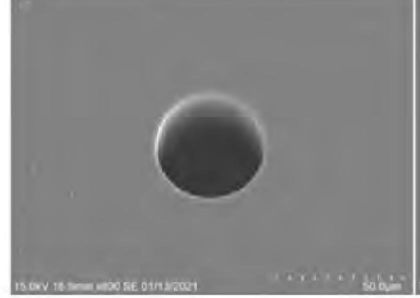
DRY FILM PHOTORESIST

FEATURES

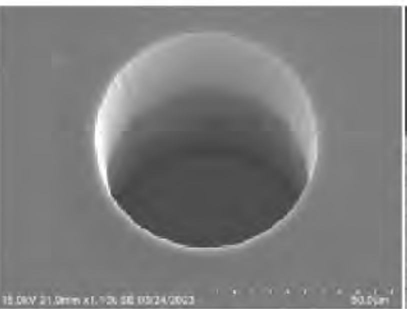
- High resolution, high aspect ratio
- Excellent adhesion
- Copper pillar bump for semiconductor package
- Easy to Strip

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=40μm



BR42240 Diameter=80μm

BR42120 Diameter=40μm

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

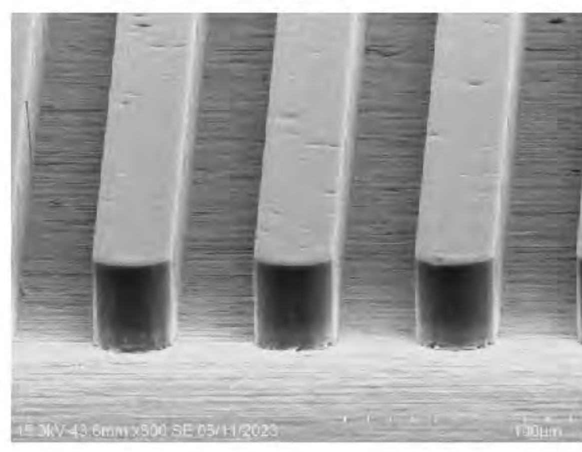
*1：Exposure: Projection *2：50 % BP, 28 ℃

ETERTEC® HT200F

SEMI -LDI

Semi-LDI DRY FILM PHOTORESIST

FEATURES	特性
For semi-laser direct imaging applications	適用雷射曝光製程
Excellent tenting ability	蓋孔能力優異
Excellent resolution and adhesion	優良線路解析度及附著力
Low developing foaming	顯影泡沫低
Good contrast after exposure	曝光後對比佳



HT215F, 22/41sst
L/S=34 μm/34 μm

CHARACTERISTICS

Item	HT215F
Thickness (μm)	38
Exposure Energy (mj/cm^2) *1	70
41 STOUFFER STEP HELD	22
Minimum Developing Time x2 (sec) *2	56
Adhesion (μm) *2	26
Resolution (μm) *2	34
Tent breakdown (via Φ 5.5 mm)	0
Stripping Break Time (sec) *3	48

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

SEMI -LDI

LAMINAR ® E9400DI

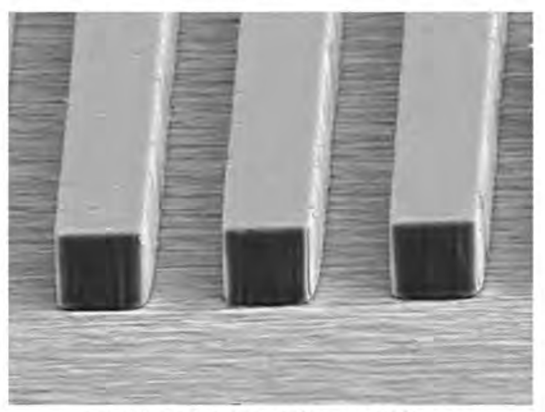
SEMI-LDI DRY FILM PHOTORESIST

FEATURES

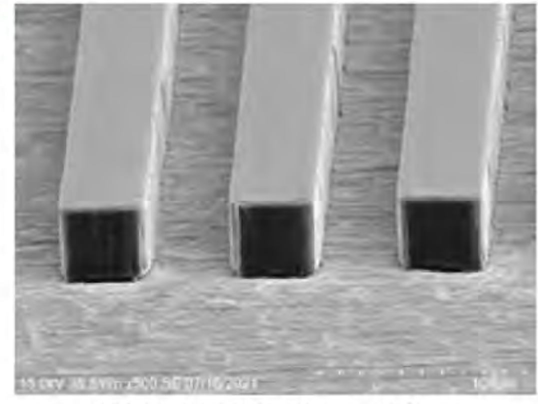
- Designed for conventional and DI/LDI exposure system applications
- For conventional exposure system, i-line and h-line
- Excellent tenting ability
- Excellent resistance to plating
- Excellent high resolution and adhesion

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	E9415DI	E9415DI
Thickness (μm)	38	38	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	22	22
Minimum Developing Time x2 (sec)*2	45	45	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 °C , *3: (Minimum Developing Time x2)x3, *4: 3% NaOH by dipping.

長興材料
ETERNAL MATERIALS

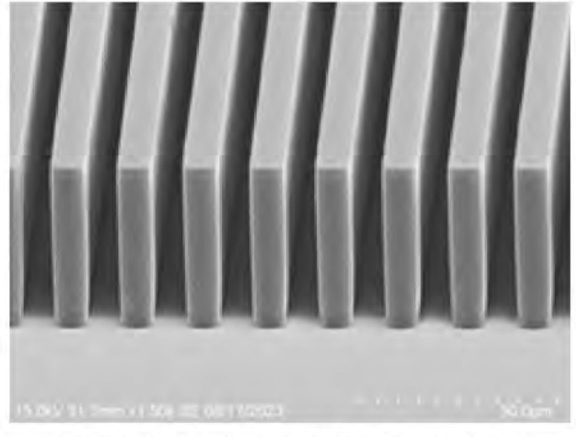
Photoresist Materials Division

ETERTEC® APR900

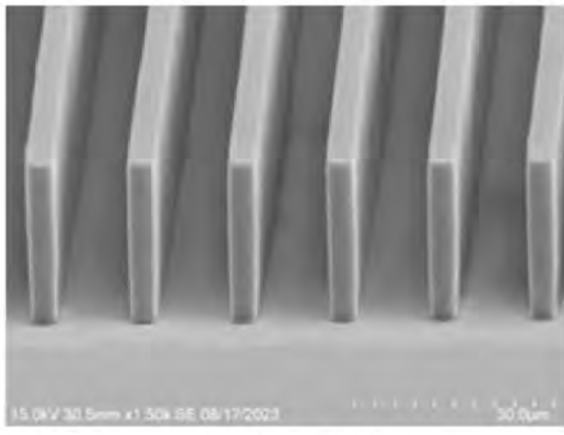
For IC Package

DRY FILM PHOTORESIST

FEATURES	特性
Designed for SAP process	針對SAP製程設計
Excellent adhesion	極佳線路附著力
Excellent resolution	極佳線路解析度
Good resistance to acid plating	酸性電鍍抗化性佳



APR910 16/41sst L/S=5 μm/5 μm



APR910 16/41sst L/S=3 μm/12 μm

CHARACTERISTICS

Item	APR910	
Thickness (μm)	25	25
Exposure Energy (mj/cm^2) *1	175	220
41 STOUFFER STEP HELD	13	16
Minimum Developing Time x2 (sec) *2	36	36
Adhesion (μm) *2	4	3.5
Resolution (μm) *2	4.5	5

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

ALPHO® ドライフィルムフォトレジスト
ALPHO® Dry Film Photoresist

高解像ドライフィルムフォトレジスト LDF700 series
High resolution Dry Film Photoresist LDF700 series

- 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 excels in reduction of under plating and resist residue.
- 用途 Application: SAP, MSAP, Fine line etching
- 製品膜厚 Resist thickness: (15), 20, 25 μm

レジスト特性 Resist Performance

ドライフィルム Dry film	LDF720 ※1	LDF725 ※1
レジスト厚 Resist Thickness (μm)	20	25
最少現像時間 Break Point (sec.)	13	18
露光量 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
独立細線 Fine Line Adhesion (L/S =x/9x, μm)	6	6
剥離時間 ※2 Stripping Time (sec.)	15	22
剥離片サイズ ※2 Stripping flake size (mm)	<5	<5

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

	LDF720	LDF725
レジスト形状 Resist profile	X1,500 10μm L/S=6/6μm	X1,500 10μm L/S=6/6μm

Photoresist Materials Division

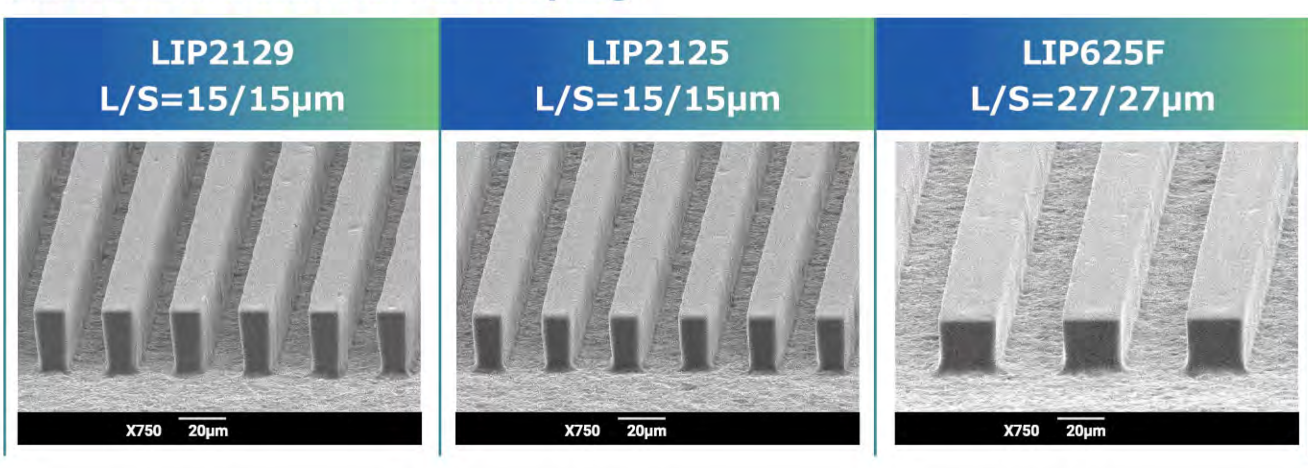
ALPHO® ドライフィルムフォトレジスト

ALPHO® Dry Film Photoresist

For Inner Etching, High Photosensitivity DI Grade LIP2100 Series

- It is Dry Film Photo Resist to realize high photosensitivity, high resolution and low foaming performance for inner etching process.
- Designed for LDI exposure machine (h-line).

Resist Pattern after Developing



Resist Performance

Dry film	LIP2129	LIP2125	LIP625F
Resist Thickness (μm)	29	25	25
Break Point (sec.)	21	18	13
Exposure Energy (mJ/cm^2)	24	21	20
Resolution L/S=x/x (μm)	15	15	27
Adhesion L/S=x/9x (μm)	17	17	20

※1 Development condition: 1.0%Na_2CO_3, 30℃, BP x 2
※2 ORC h-line LDI

Photoresist Materials Division

ETERTEC® PR8200 Series

Photo-Imageable Coverlay (PIC)

ETERTEC® PR8200是低溫150℃烘烤型的高精密度乾膜感光弱鹼顯像型光阻，應用於高精密度亞醯胺基板(PI)/金屬基板外層線路保護.

ETERTEC® PR8200 series are alkaline developable photosensitive dry film permanent photoresist of low temperature 150℃ post-bake used for the high accuracy polyimide substrate (PI) / metal substrate to protect wiring.

- 操作範圍寬
- 優良解析能力與結構完整性
- 底材密著性佳
- 優良耐熱焊錫性
- 優良耐化學鎳金
- 優良柔韌性與低反翹力

- Wide operation
- High resolution and conformation
- Excellent adhesion to substrate
- Excellent high temperature solder resistance
- Excellent Electro-less Ni/Au plating resistance
- Excellent flexibility and low warpage / sharp memory

ITEM		ETERTEC®	
		PR8200B1	PR8200Y1
(Applications)		Flexible-board	
Color		Matt black	Amber
Thickness		23 μm/ 30 μm/ 38 μm	
Solid content		100 wt%	
Shelf life		3 months (In dark room below 0~5 ℃)	
Minimum developing time 1%(wt) Na_2CO_3 aqueous solution at 30 ℃		~50% Break point	
Exposure energy High mercury lamp (ORC EXM-1201F 5KW)		250 ~ 350 mJ/cm^2	200 ~ 300 mJ/cm^2
Recommended Eternal 21-step tablet		8 ~ 10 step (x / 21)	
Resolution	Line/Space L/S=n/n (μm)	60 μm / 60 μm	50 μm / 50 μm
Resistance to bending (180° x 500 g x 10 sec)		20 cycles	20 cycles
Warpage		≦1 mm	≦1 mm
Cosmetic-Glossiness (60°)		~10 GU	>90 GU

Resolution

Conformation

Low warpage / Sharp-memory

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?

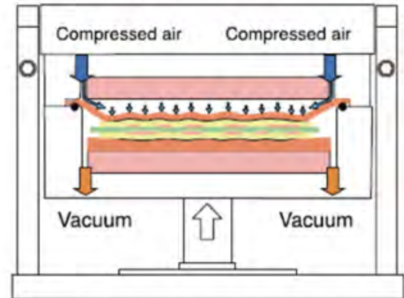
氣囊式壓膜是指通過矽橡膠的彈性變化，實現對板面凹凸、段差等的填附，並通過抽取板材與膜材料之間的空氣， 真空下消除氣泡並使膜材料與板材貼合。

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。

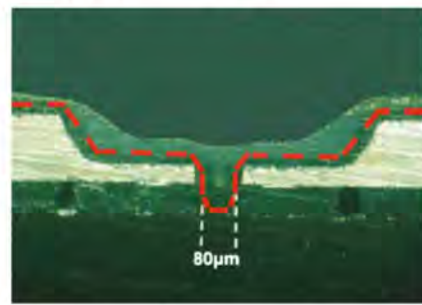
Diaphragm Lamination is to laminate with silicon rubber.

- 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?

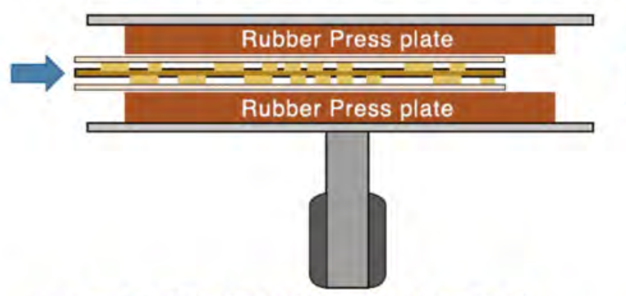
橡膠壓台式壓膜是指在垂直方向施加高壓，通過橡膠台面的彈性變化，讓膜材料貼着板材的凹凸變化進行壓合。在第二段進行樹酯材料表面的平整性處理。適合自動化生產作業，相較傳統多段式真空壓合生產效率更高。

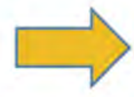
Rubber Press Lamination is to laminate with high pressure in vertical direction.
- 1st stage /Elastic rubber press plate fits uneven substrate and conforms film.
- 2nd stage /SUS plate press does Resin flattening.

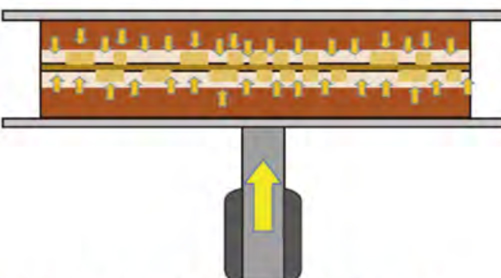
Rubber press laminator is suitable for automation. The production efficiency is much better than Multiple pressing equipment.

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.

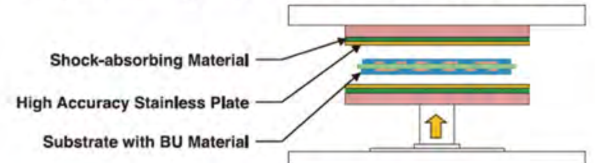






2nd 平整段實現樹脂表面的平坦性。

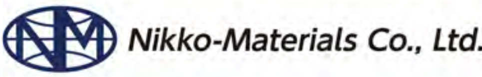
2nd Flattening Press finishes resin surface flat.



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

EFV-1000 VACUUM LAMINATOR
真空壓膜機

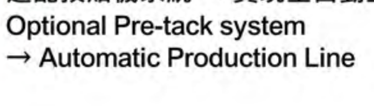
Features 特色

- 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

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

長遠規劃未來 興創世界品牌

Your Solution Provider Move Forward with Time

- **Dry Film Photoresist**
  負型水溶性乾膜光阻
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  乾膜防焊光阻
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  感光型覆蓋膜
- **Liquid UV Curable Marking Ink**
  液態文字油墨
- **Copper Clad Laminate**
  銅箔基板
- **Vacuum Laminator**
  真空壓膜機
- **Toll Coating Service**
  精密塗佈代工

光阻事業部
Photoresist Materials Division