



RESONAC

Making contribution to our future with our
advanced technologies in various field of
applications founded in PWB photoresist technology

Photec

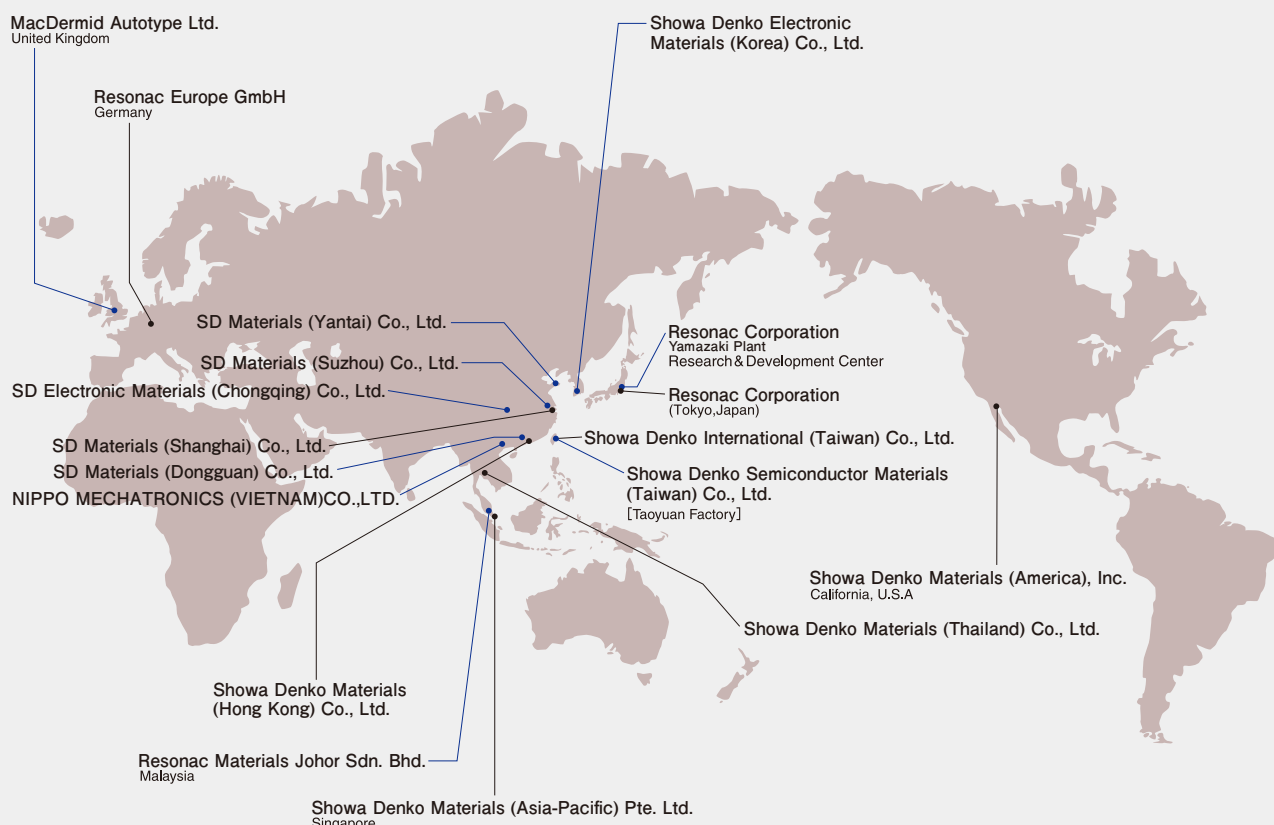
感光性フィルム「フォテック」

GLOBAL NETWORK

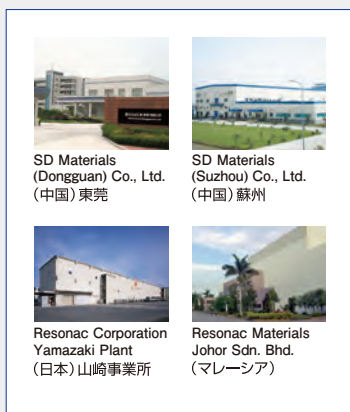
グローバルネットワークを駆使して、
お客さまの様々なニーズにお答えします。

We use our global network to meet the various needs of our customers.

2023.1 現在 (*As of January 2023)



■ 塗工拠点 Coating Bases



■ スリット拠点 Slitting Bases



■ R&Dセンター R&D Centers



ダイレクトイメージング用感光性フィルム

「フォテック」FL-3000 シリーズ

Photosensitive Dry Film "PHOTEC" FL-3000 Series for Direct Imaging

特長 Features

- 直描露光方式 (光源:375 nm・405 nm) に適した感光性フィルムです。
FL series are suitable for UV laser direct imaging system (light source:375 nm・405 nm).
- 感度が高く、密着性・解像度が良好で、高密度回路の形成性に優れます。
FL-3000 series are appropriate for forming HDI (High density interconnect) due to high photosensitivity, adhesion and resolution.

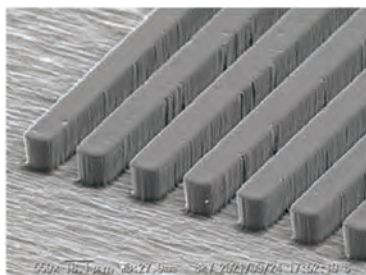
技術内容・特性 Specifications

(測定値の一例 One of our data)

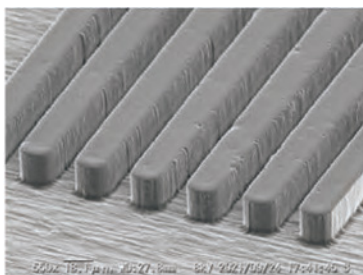
項目 Items	単位 Units	FL-3025	
		375 nm	405 nm
レジスト膜厚 Resist thickness	μm	25	25
露光量 *1 Exposure energy	mJ/cm ²	15	17
密着性 (L/S=x/400) Adhesion	μm	17.5	17.5
解像度 (L/S=x/x) Resolution	μm	20	20

*1:推奨硬化ST段数 375 nm:ST=17/41、405 nm:ST=20/41、Nuvogo Fine-8(日本オルボテック製)
Recommended 375 nm:ST=17/41、405 nm:ST=20/41、Nuvogo Fine-8(Orbotech Japan Co.,Ltd.)

現像後レジスト形状
Resist Profile after Development



FL-3025 (Wave length:375 nm)
(L/S=20 μm/20 μm)



FL-3025 (Wave length:405 nm)
(L/S=20 μm/20 μm)

厚膜レジスト形成用感光性フィルム

「フォテック」HM-4000シリーズ

Photosensitive Dry Film "PHOTEC" HM-4000 Series for Thick Resist Layer

特長 Features

- 解像度・密着性に優れ、高アスペクト比のレジストが形成可能です。
Excellent resolution and adhesion make it possible to form a resist with higher aspect ratio.
- 用途に応じた膜厚ラインアップを展開しています（膜厚35～200 μm、応相談）
Thickness lineup according to the application (thickness; 35～200 μm, available upon request)
- レジストのサイドウォール形状が優れるため、良好なめっきライン形状が形成が可能です。
Smooth sidewall of plating line due to the smooth resist profile.

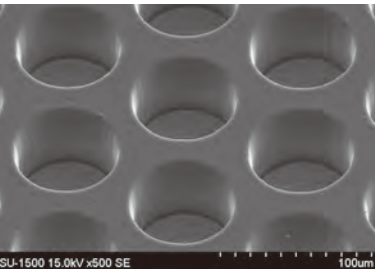
技術内容・特性 Specifications

（測定値の一例 One of our data）

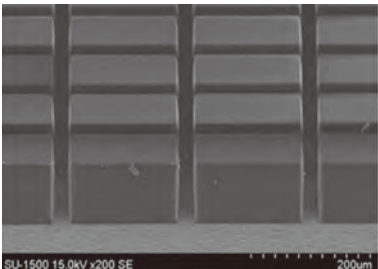
項目 Items	単位 Units	HM-4035	HM-4056	HM-4075	HM-4090	HM-40112	HM-40168C
膜厚 Thickness	μm	35	56	75	90	112	168
露光量*1 Exposure energy	mJ/cm ²	85	85	130	170	270	530
密着性 (L/S=x/400) Adhesion	μm	18	22	35	30	32	40
解像度 (L/S=x/x) Resolution	μm	18	32	35	40	50	100

*1:平行光露光機 Collimated light type

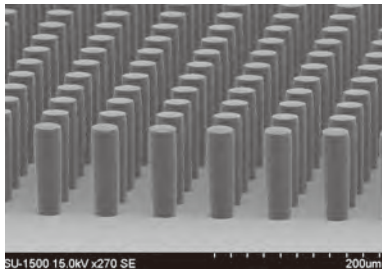
レジスト形成例
Resist Profile



HM-4056
レジスト膜厚:56 μm、Φ=60 μm
Resist thickness:56 μm、Φ=60 μm



HM-40112
レジスト膜厚:112 μm、L/S=180 μm/30 μm
Resist thickness:112 μm、L/S=180 μm/30 μm



HM-40112
レジスト膜厚:112 μm
レジスト直径:Φ=30 μm(スペース:40 μm)
Resist thickness:112 μm
Resist diameter:Φ=30 μm(Space:40 μm)

半導体PKG基板用感光性フィルム

「フォテック」RD-3000 シリーズ

Photosensitive Dry Film "PHOTEC" RD-3000 Series for PKG Boards

特長 Features

- RD-3000は355 nm、405 nmを光源とする直描機に適しています。
RD-3000 is suitable for applying to the direct imaging system for 355 nm and 405 nm.
- 高密着性、高解像性を有しており、めっき工法による微細回路形成に適しています。
Excellent adhesion and resolution, make it suitable for fine pattern manufacturing by plating.

技術内容・特性 Specifications

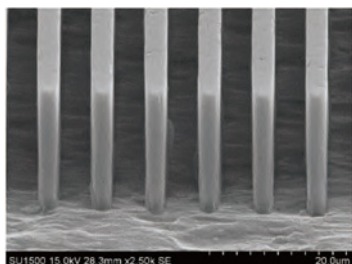
(測定値の一例 One of our data)

項目 Items	単位 Units	RD-3015	RD-3019	RD-3025
レジスト膜厚 Resist thickness	μm	15	19	25
最小現像時間 Minimum developing time	Sec.	10	15	22
露光量*1 Exposure energy	mJ/cm ²	95	95	85
密着性 (L/S=x/3x) Adhesion (L/S=x/3x)	μm	4	5	7
解像度 (L/S=x/x) Resolution	μm	4	5	7

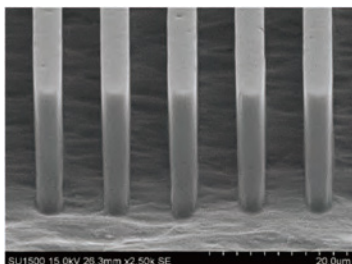
*露光機: DE-1 UH(アドテックエンジニアリング製、405 nm直描)
基板ラフネス Ra: 0.4 μm
露光後加熱 (P.E.B.): 80°C, 30 Sec. (箱型乾燥機)
現像液: 1.0 wt% Na₂CO₃aq., 30°C, 0.16 MPa

DE-1 UH was applied (Adtec Engineering Co., Ltd, 405 nm DI)
Substrate roughness Ra: 0.4 μm
Post exposure bake (P.E.B.): 80 degree C, 30 Sec. (Box Oven)
Developer: 1.0 wt% Na₂CO₃aq., 30 degree C, 0.16 MPa

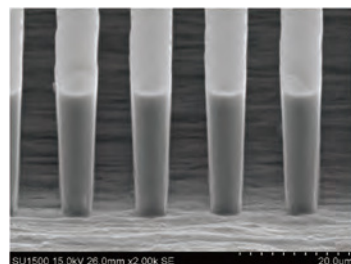
現像後レジスト形状
Resist Profile after Development



RD-3015 (L/S=4 μm/4 μm)



RD-3019 (L/S=5 μm/5 μm)



RD-3025 (L/S=7 μm/7 μm)

半導体PKG基板用感光性フィルム

「フォテック」RY-5800 シリーズ

Photosensitive Dry Film "PHOTEC" RY-5800 for Direct Imaging

特長 Features

- RY-5800は365nmを光源とする露光機に適しています。
RY-5800 is suitable for the i-line projector device for 365nm.
- 高密着性および高解像性を有しており、
セミアディティブ工法に対応可能な感光性フィルムです。
Excellent adhesion and resolution, make it suitable for semi-additive process(SAP).

技術内容・特性 Specifications

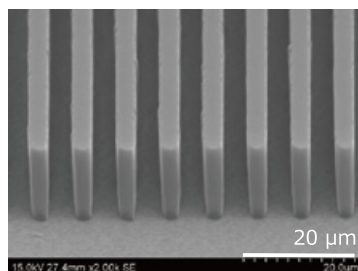
(測定値の一例 One of our data)

項目 Items	単位 Units	RY-5815 開発品/ Under development	RY-5819 開発品/ Under development	RY-5825
レジスト膜厚 Resist thickness	μm	15	19	25
最小現像時間 Minimum developing time	Sec.	13	16	23
露光量 Exposure energy	mJ/cm ²	110	120	120
密着性(L/S=x/3x) Adhesion	μm	4	5	6
解像度(L/S=3x/x) Resolution	μm	4	5	6

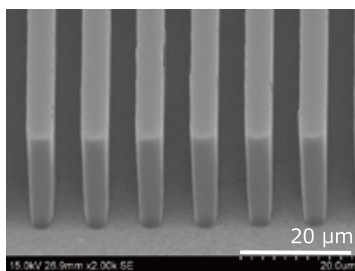
投影露光機 / Projector machine; i-line projector

現像条件 / Developing conditions; 1.0 wt% Na₂CO₃aq., 30 °C, Minimum developing time×2

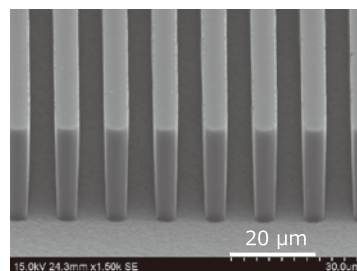
現像後レジスト形状
Resist profile after development



RY-5815
(開発品 /Under development)
L/S=4 μm/4 μm



RY-5819
(開発品 /Under development)
L/S=5 μm/5 μm



RY-5825
L/S=6 μm/6 μm

半導体PKG基板用感光性フィルム

「フォテック」RY-5100UT シリーズ

Photosensitive Dry Film “PHOTEC” RY-5100UT for Direct Imaging

特長 Features

- RY-5100UTは365nmを光源とする露光機に適しています。
RY-5100UT is suitable for the i-line projector device for 365nm.
- 高密着性および高解像性を有しており、
セミアディティブ工法で微細回路形成可能な感光性フィルムです。
Excellent adhesion and resolution, make it suitable for fine pattern manufacturing by SAP.

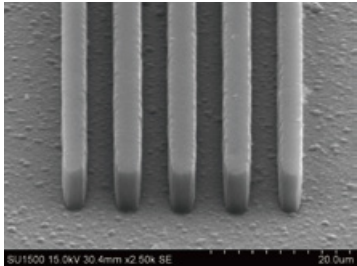
技術内容・特性 Specifications

(測定値の一例 One of our data)

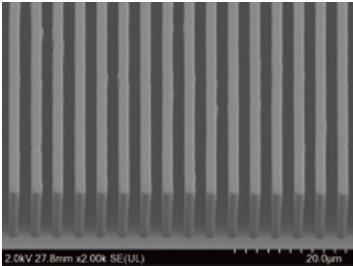
項目 Items	単位 Units	RY-5107UT	RY-5110UT
レジスト膜厚 Resist thickness	μm	7	10
最小現像時間 Minimum developing time	Sec.	7	10
露光量 Exposure energy	mJ/cm ²	200	200
密着性(L/S=x/3x) Adhesion	μm	≤3	4
解像度(L/S=3x/x) Resolution	μm	≤4	4

投影露光機 / Projector machine: i-line projector
現像条件 / Developing conditions: 1.0 wt% Na₂CO₃aq, 30 °C, Minimum developing time×2

現像後レジスト形状
Resist profile after development



RY-5107UT
(L/S=4 μm/4 μm)
Substrate : ABF (Ra≒100 nm)



RY-5107UT
(L/S=2 μm/2 μm)
Substrate : Si-wafer (Ra≒10 nm)

Cautions on Safety

Photosensitive film contains acrylic monomers, so it may cause skin-irritation and allergic effects. Especially it affects allergic people conspicuously. So be careful in the following.

1. Do not contact resist directly because it may cause a rash. Flush away with soap plenty water when you contact it. When you get it in your eyes, flush it away with plenty of water and seek medical attention.
2. Install a device for exhausting gas at laminator and an indoor ventilation system not to inhale vapor from the unexposed film during lamination.
3. In the process of using photosensitive film, polyethylene film and polyester film are discarded. These films, which have been in contact with the unexposed resist, may contain trace amounts of irritants and should not be reused.
4. Put on protect tools such as gloves and glasses when you renew developer and stripper or do maintenance check of your machines.

Cautions on Storage

1. When storage is done in a dark, cool, and dry place at the temperature of 5 ~ 20 degrees and relative humidity of 60% (20 degrees) or lower, Photosensitive film should be used within 30 days after manufacture. Keep film rolls horizontally by using of racks or support boards for storage. When they are laid vertically, sheets of photosensitive film may slip one by one and roll-shape may be like bamboo sprouts (rolls are laid down horizontally in a package).
2. Take out film rolls from black sheet under a yellow lamp or the same kind of safety lamp. Do not leave them under the yellow lamp for a long time. Cover film rolls by black sheet when you store them for a long time.

Cautions

1. Based on our experience, we believe that the above information is accurate, but we offer no guarantee as to the use or application of our products or of this information.
2. We warrant our products to be free from defects in material and workmanship; but because their use is beyond our control, we accept no responsibility or liability for damages, whether direct, indirect or consequential, resulting from failure in performance.
3. In cases whether our products are found to be defective in material and workmanship, our liability is limited to the purchase price of the products found to be defective.
4. THIS WARRANTY IS TO THE EXCLUSION OF ALL OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, DESCRIPTION, PRODUCTIVENESS OR ANY OTHER MATTER.
5. None of the above information may be constructed as a recommendation that our products be used in violation of any patent rights.

Resonac Corporation

Photosensitive Materials BU. Head Office	Gran Tokyo-South Tower, 1-9-2, Marunouchi, Chiyoda-ku Tokyo, 100-6606, Japan	Phone : +81-3-5533-6680
Resonac Europe GmbH (Sales office)	Abraham-Lincoln-Str. 44, 65189 Wiesbaden, Germany Berliner Allee 22, 40212 Düsseldorf, Germany	Phone : +49-211-166730
Showa Denko Materials (Asia-Pacific) Pte. Ltd.	180 Clemenceau Avenue #02-01, Haw Par Centre, Singapore 239922	Phone : +65-6836-6988
Showa Denko Materials (Hong Kong) Co., Limited	Unit 702, 7/F, Building 20E, Phase 3, Hong Kong Science Park, Pak Shek Kok, New Territories, Hong Kong, China	Phone : +852-2366-9304
Showa Denko International (Taiwan) Co., Ltd.	Room No.606, Chia Hsin Building, 96, Sec. 2, Chung Shan N. Road, Taipei, Taiwan	Phone : +886-6-505-3111
Showa Denko Electronic Materials (Korea) Co., Ltd.	Neunggil-Ro 106, Danwon-Gu, Ansan-Si, Gyeonggi-Do, 15421, Korea	Phone : +82-31-599-5500
SD Materials (Shanghai) Co., Ltd.	Unit2102, Park Place, No.1601, Nanjing(W) Road, Jing An District, Shanghai 200040, China	Phone : +86-21-6288-8870