MEGAPOSIT™ SPR™3600M i-LINE SERIES PHOTORESISTS

For Microlithography Applications

Regional Product Availability

- North America
- Europe, Middle East and Africa
- Latin America
- Asia-Pacific

Description

MEGAPOSIT SPR3600M Series Photoresists is a dyed photoresist engineered for extremely high throughput processing on reflective substrates. SPR3600M photoresist offers control over reflective notching and CD variation while providing excellent process latitude and high thermal stability. SPR3600M photoresist also possesses multi-wavelength capabilities and is compatible across a wide variety of developer families and normalities. As with all Dow Electronic Materials i-Line photoresists, SPR3600M has been formulated with safer solvent alternatives.

Advantages

- High throughput exposure
- At 1.82 µm film thickness:
  - E_s @ 101 mJ/cm^2 for 0.26N developer
  - E_s @ 135 mJ/cm^2 for 0.24N developer
- 32% swing curve reduction vs. undyed
- Thermal stability ≥125°C (dyed, thick film)
- Multiwavelength (i-Line, g-Line, broadband)
- Compatible across a wide variety of developer families (0.26N, 0.24N, 0.21N)
- Excellent for mix-and-match applications

Figure 1.

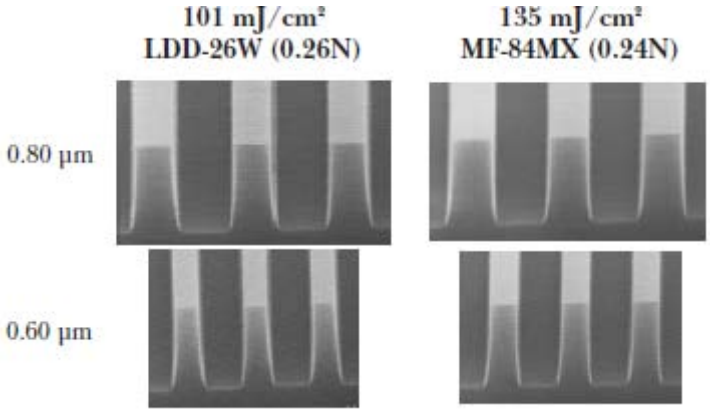

Table 1. Process Conditions (Refer to Figure 1)	
Photoresist	MEGAPOSIT SPR3617M
Thickness	1.82 µm (E_{max})
Softbake	90°C/60 sec. Contact Hotplate
Exposure	i-Line (0.55 NA, 0.54σ)
PEB	115°C/60 sec. Contact Hotplate
Develop	As indicated /60 sec. SP @ 21°C

Table 2. Lithographic Summary*					
Property	MF™ CD-26 (60 SP)		MF CD-26 (40 SP)		MF-84MX (60 SP)
i-Line (0.55NA, 0.54σ)	**1.00 µm L/S**	**0.80 µm L/S**	**1.00 µm L/S**	**0.80 µm L/S**	**0.80 µm L/S**
Photospeed, E_0	75 mJ/cm^2	75 mJ/cm^2	90 mJ/cm^2	90 mJ/cm^2	90 mJ/cm^2
Sizing Energy, E_s	109 mJ/cm^2	109 mJ/cm^2	124 mJ/cm^2	123 mJ/cm^2	135 mJ/cm^2
Resolution	—	—	—	—	0.475 µm
Masking Linearity	0.50 µm	—	0.50 µm	—	0.550 µm
Exposure Latitude (± 10% nom)	35.2%	21.9%	38.2%	34.2%	—
Focus Latitude (± 10% nom)	≥1.95 µm	≥1.65 µm	≥1.95 µm	≥1.65 µm	≥1.95 µm

*All Table 2 data obtained @ 1.82 µm Film Thickness

Figure 2. Spin Speed Curve

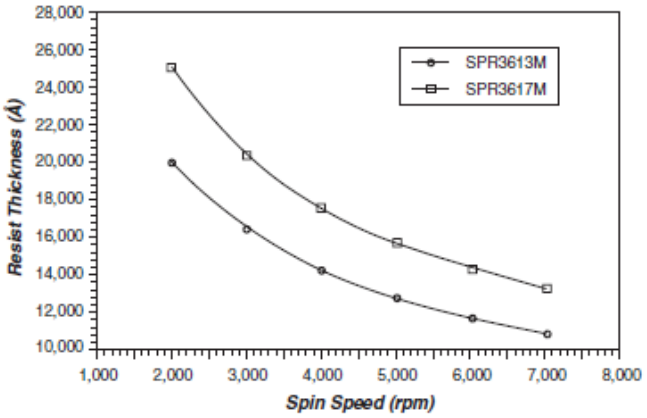

Figure 3. Dispersion Curve

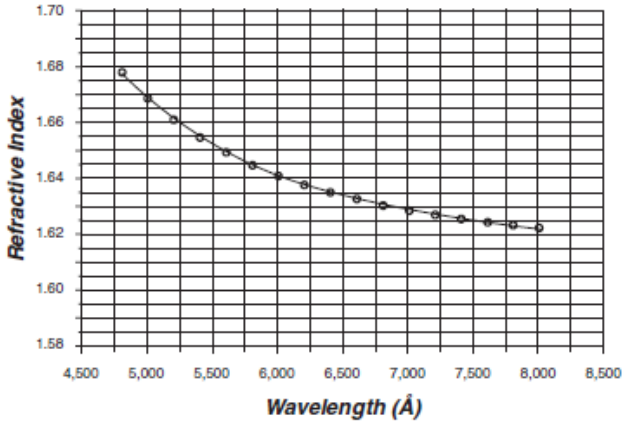

Table 3. Approximated Cauchy Coefficients	
n_1	1.6116
n_2	2.33e+05
n_3	2.99e+13

Figure 4. Absorbance Curve

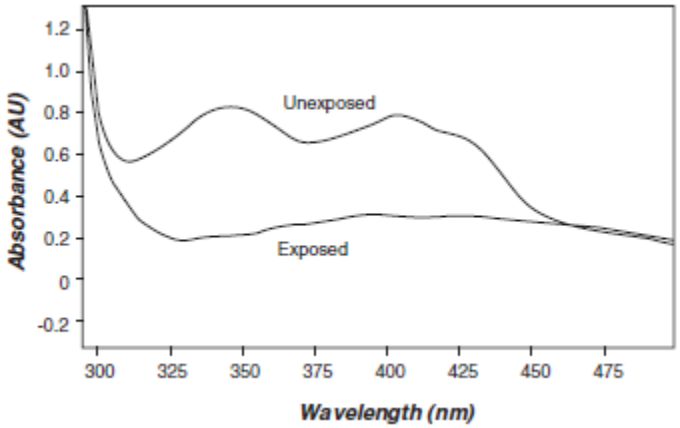

Figure 5. i-Line Interference Curve

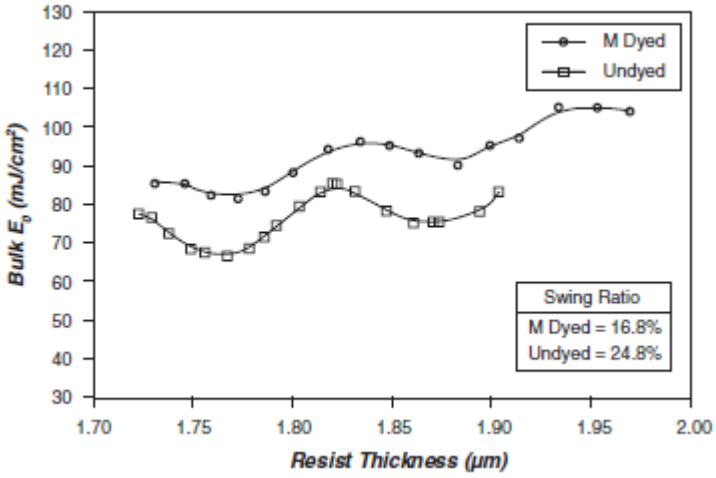

Figure 6. Hardbake Thermal Characteristics

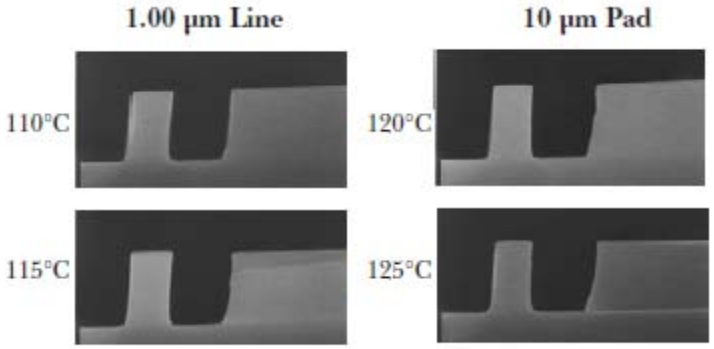

Table 4. Dill Parameters			
	365 nm	405 nm	436 nm
Dill A	0.804 μm^{-1}	0.905 μm^{-1}	0.510 μm^{-1}
Dill B	0.389 μm^{-1}	0.454 μm^{-1}	0.450 μm^{-1}

Table 5. Fundamental Physical Characteristics	
Absorption Parameter A	0.657 μm^{-1}
Absorption Parameter B	0.327 μm^{-1}
Absorption Parameter C	0.0157 cm^2/mJ
Refractive Index	1.705
PEB Diffusion Length	75 nm
Max Develop Rate	168 nm/sec.
Min Develop Rate	0.475 nm/sec.
Threshold M	0.55
Selectivity Parameter n	6.5
Relative Surface Rate	0.3
Inhibition Depth	0.3 µm

Handling Precautions

Before using this product, associated generic chemicals or the analytical reagents required for its control, consult the supplier's Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on material hazards, recommended handling precautions and product storage.

CAUTION! Keep combustible and/or flammable products and their vapors away from heat, sparks, flames and other sources of ignition including static discharge. Processing or operating at temperatures near or above product flashpoint may pose a fire hazard. Use appropriate grounding and bonding techniques to manage static discharge hazards.

CAUTION! Failure to maintain proper volume level when using immersion heaters can expose tank and solution to excessive heat resulting in a possible combustion hazard, particularly when plastic tanks are used.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Electronic Materials Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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Contact:
North America: 1-800-832-6200
Taiwan: 886-37-539100
China: (+86) 21-3851-1000
Hong Kong: (+852) 2879-7333
Korea: (+82) 2-3490-0700
Japan: (+81) 3-5460-2200
Europe: (+41)(0)44-728-2111
www.dowelectronicmaterials.com