



# MEGAPOSIT™ SPR™ 955-CM SERIES PHOTORESIST

For Microlithography Applications

## DESCRIPTION

MEGAPOSIT SPR955-CM Series Photoresist is a general purpose, high-throughput, i-Line photoresist for 0.35  $\mu\text{m}$  front-end and back-end applications.

## ADVANTAGES

### 0.35 $\mu\text{m}$ Design Rules

- Dense lines/spaces and isolated lines on polysilicon
- Dense lines/spaces in high-aspect ratio films on TiN
- Contact holes on oxide
- Isolated spaces (trenches)

### Fast Photospeed

- 165  $\text{mJ}/\text{cm}^2$  at 0.25  $\mu\text{m}$  lines/spaces in 0.97  $\mu\text{m}$  resist thickness
- 245  $\text{mJ}/\text{cm}^2$  at 0.40  $\mu\text{m}$  lines/spaces in 1.40  $\mu\text{m}$  resist thickness

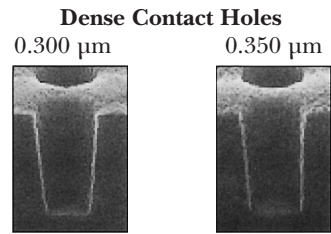
**Table 1. Recommended Process Conditions**

Contact Holes	
Thickness	0.70–1.20 $\mu\text{m}$
Softbake	90°C/90 sec. Proximity Hotplate
PEB	120°C/90 sec. Proximity Hotplate
Developer	Recommended for 0.26N; Compatible with 0.24N

**Table 2. Recommended Process Conditions**

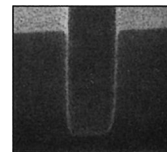
Lines/Spaces	
Thickness	1.00–2.30 $\mu\text{m}$
Softbake	100°C/90 sec. Proximity Hotplate
PEB	110°C/90 sec. Proximity Hotplate
Developer	Recommended for 0.26N; Compatible with 0.24N

Figure 1.



FT: 0.865  $\mu\text{m}$   
SUB: 3,000Å Silicon  
DEV: MF™-501 (0.24N)

**Isolated Trench**  
0.300  $\mu\text{m}$



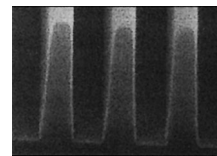
FT: 0.910  $\mu\text{m}$   
SUB:  $\text{Si}_3\text{N}_4$   
DEV: MF-501 (0.24N)

**Dense and Isolated Lines/Spaces**  
0.325  $\mu\text{m}$  Dense Lines/Spaces    0.250  $\mu\text{m}$  Isolated Line



FT: 0.970  $\mu\text{m}$   
SUB: Polysilicon  
DEV: MF CD-26 (0.26N)

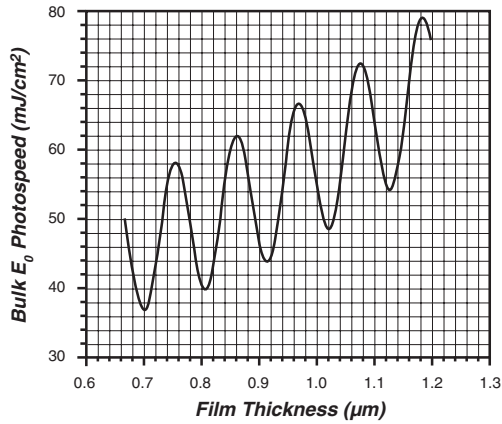
**Dense Metal Features**  
0.340  $\mu\text{m}$  Dense Lines/Spaces



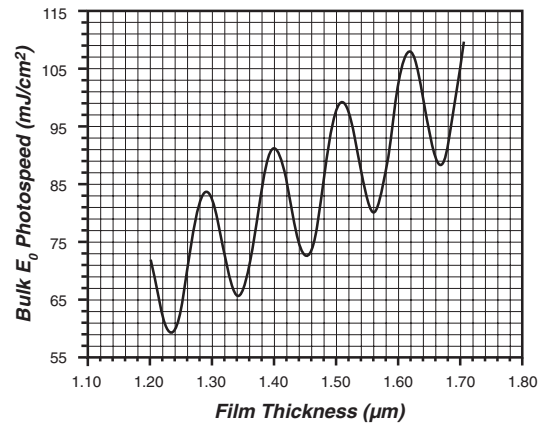
FT: 1.40  $\mu\text{m}$   
SUB: 400Å Titanium Nitride  
DEV: MF-501 (0.24N)

# MEGAPOSIT SPR955-CM SERIES PHOTORESIST

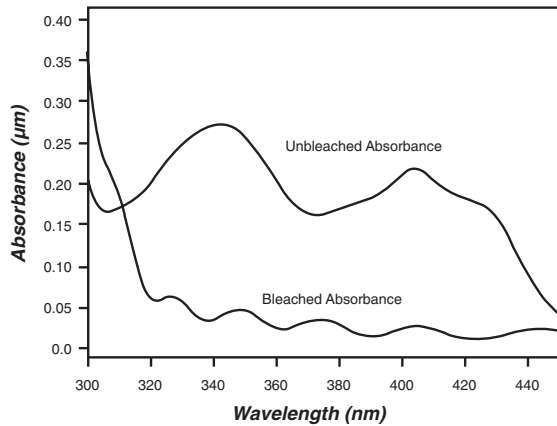
**Figure 2. Interference Curves on Silicon at 0.70–1.15  $\mu\text{m}$  Thickness**



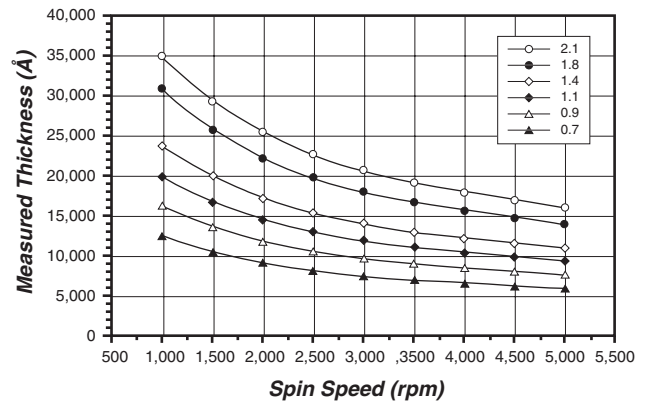
**Figure 4. Interference Curves on Silicon at 1.20–1.65  $\mu\text{m}$  Thickness**



**Figure 3. Absorbance Curves**



**Figure 5. Spin Speed Curve**



**Table 3. Cauchy Coefficients**

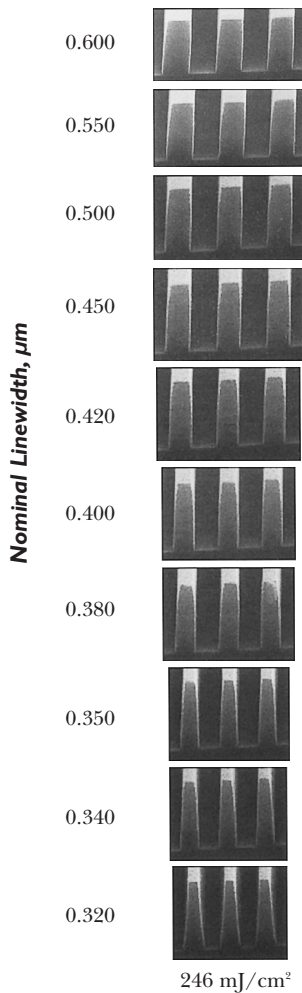
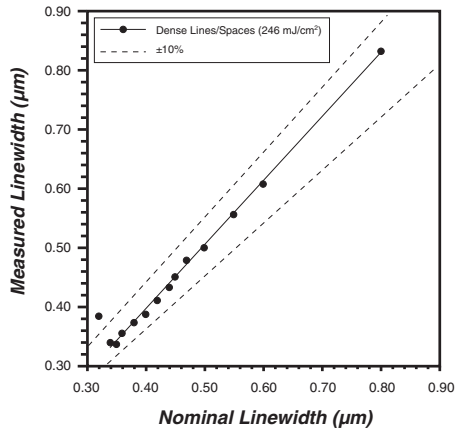
$n_1$	1.6463
$n_2$	-2.2496e+6
$n_3$	6.3448e+13

**Table 4. Dill Parameters**

Dill A Value	0.76 $\mu\text{m-l}$
Dill B Value	0.05 $\mu\text{m-l}$

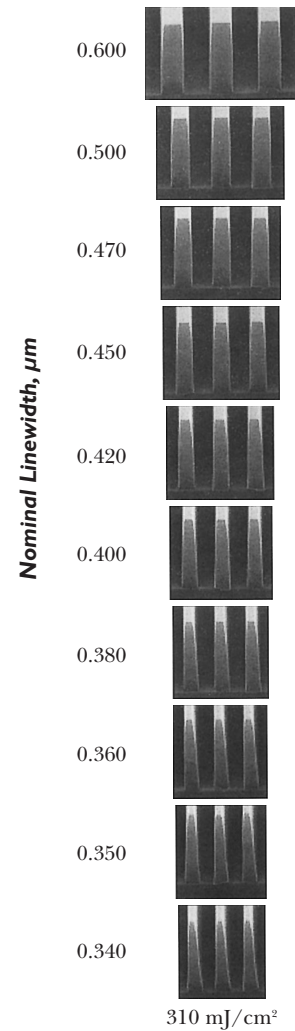
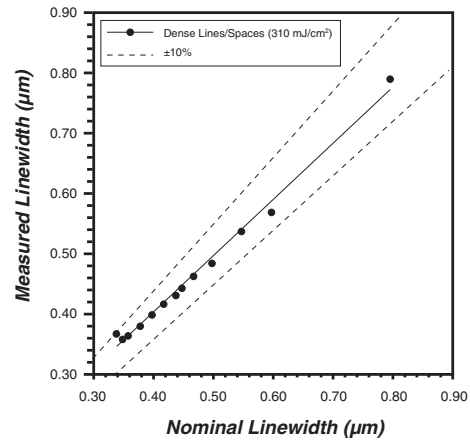
## MEGAPOSIT SPR955-CM SERIES PHOTORESIST

Figure 6. Linearity for Dense Lines/Spaces at 1.4  $\mu\text{m}$



SUB: 400Å TiN over 100 nm silicon  
 FT: 1.40  $\mu\text{m} \pm 50\text{\AA}$   
 SB: 100°C/60 sec. contact hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54 $\sigma$ )  
 PEB: 110°C/60 sec. contact hotplate  
 DEV: MF-701, 60 sec. SP

Figure 7. Linearity for Dense Lines/Spaces at 1.8  $\mu\text{m}$



SUB: 100 nm on Si, 1,600Å Brewer BARC  
 FT: 1.80  $\mu\text{m} \pm 50\text{\AA}$   
 SB: 100°C/90 sec. contact hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54 $\sigma$ )  
 PEB: 110°C/60 sec. contact hotplate  
 DEV: MF-501, 60 sec. SP

# MEGAPOSIT SPR955-CM SERIES PHOTORESIST

Figure 8. Linearity for Isolated Trenches

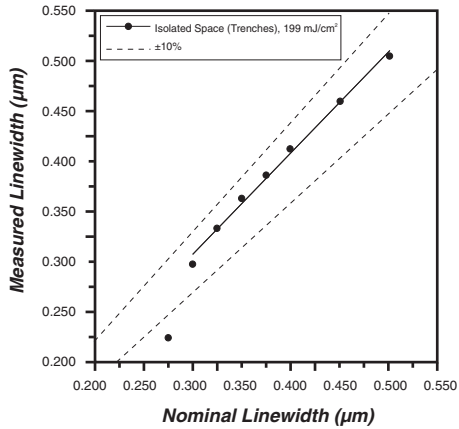
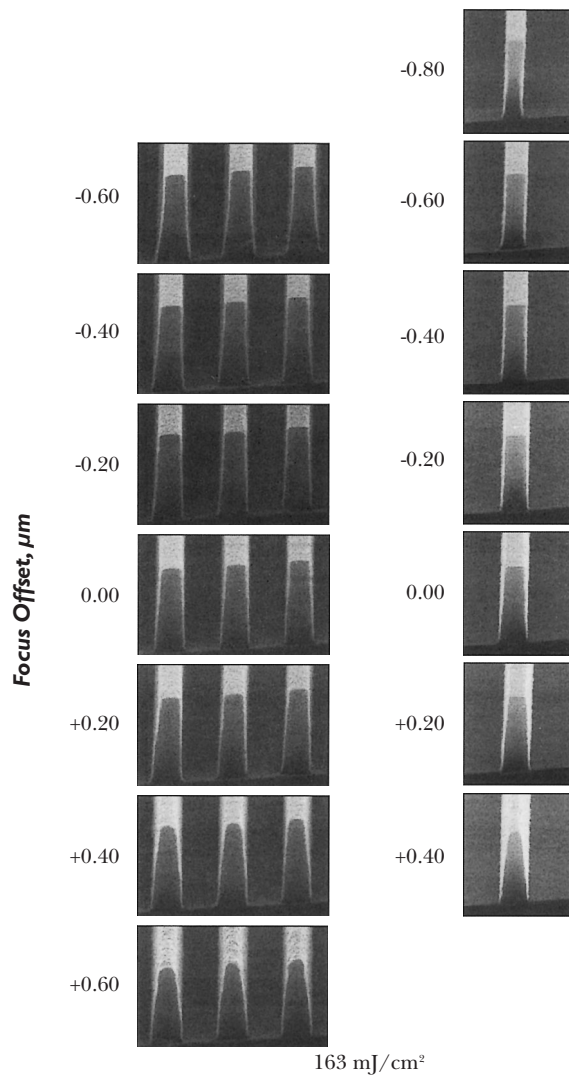
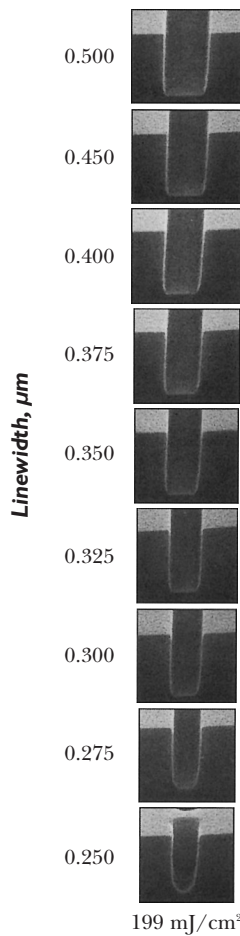
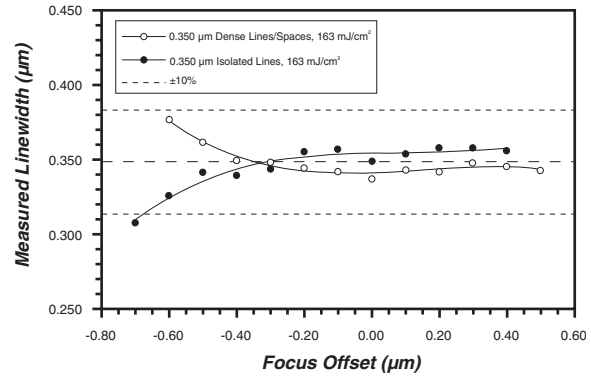


Figure 9. Focus Latitude for 0.350 µm Dense and Isolated Lines/Spaces

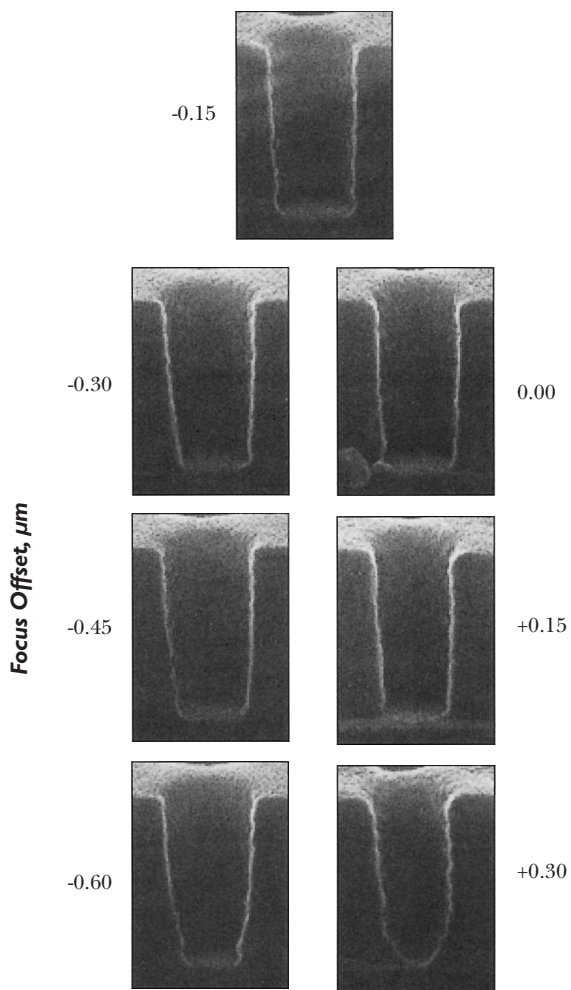
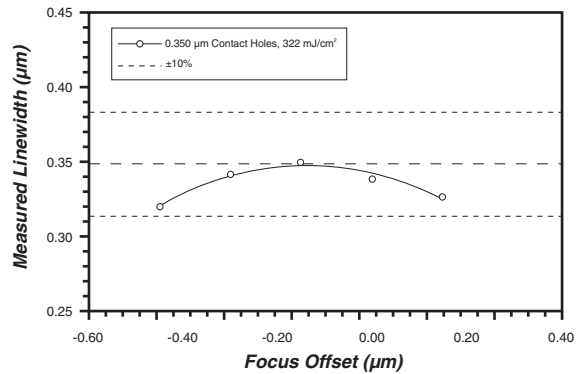


SUB: 3,000Å Si<sub>3</sub>N<sub>4</sub> on Si  
 FT: 9,100Å ±25Å  
 SB: 100°C/90 sec. contact hotplate  
 EXP: ASML PAS5500™/200 (0.55 NA, 0.65σ)  
 PEB: 110°C/90 sec. contact hotplate  
 DEV: MF CD-26, 60 sec. SP

SUB: 1,100 Å Brewer ARC™ XHRi-11 on Poly Si on Si  
 FT: 9,700Å ±25Å  
 SB: 100°C/90 sec. proximity hotplate  
 EXP: ASML PAS5500/200 (0.55 NA, 0.65σ)  
 PEB: 110°C/90 sec. contact hotplate  
 DEV: MF CD-26, 60 sec. SP

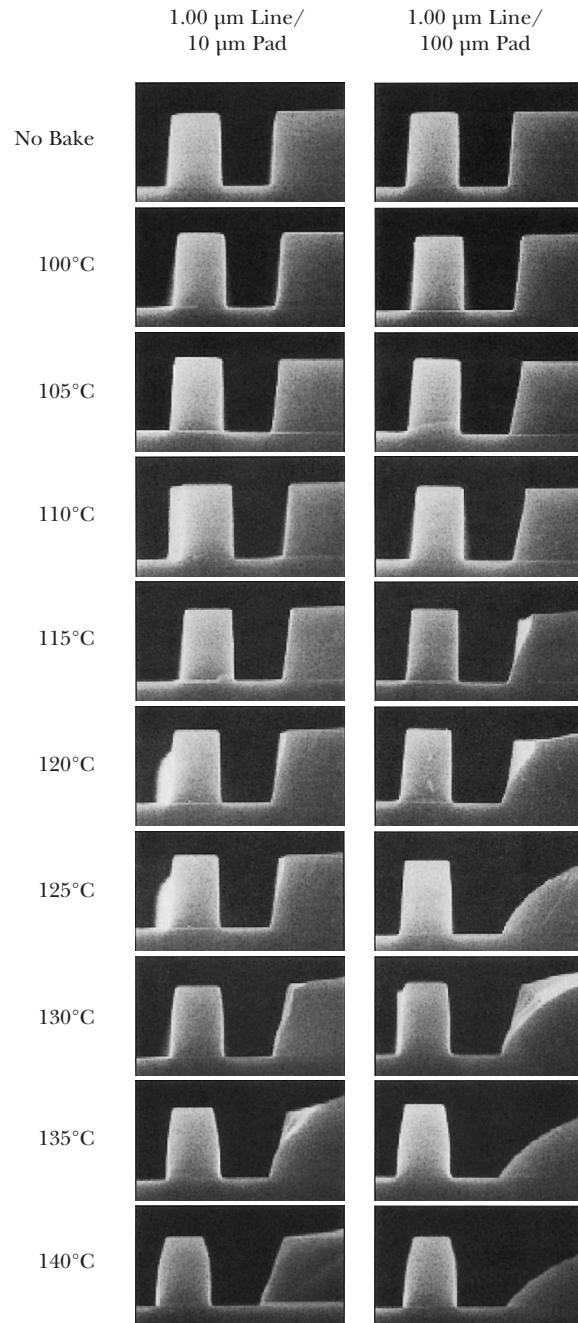
# MEGAPOSIT SPR955-CM SERIES PHOTORESIST

Figure 10. Focus Latitude for 0.350  $\mu\text{m}$  Contact Holes



SUB: 1.00 mm Si with 1,100Å XHRi-11 Brewer ARC  
 FT: 8.65  $\mu\text{m} \pm 25\text{\AA}$   
 SB: 90°C/60 sec. contact hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54 $\sigma$ )  
 PEB: 110°C/60 sec. contact hotplate  
 DEV: MF CD-26, 30 sec. SP @ 21°C (TCU)

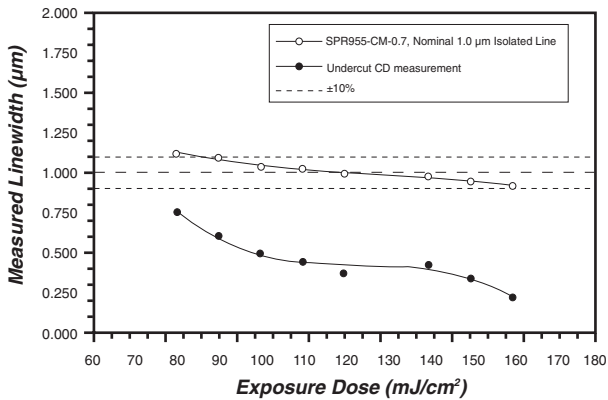
Figure 10. Thermal Flow Characteristics



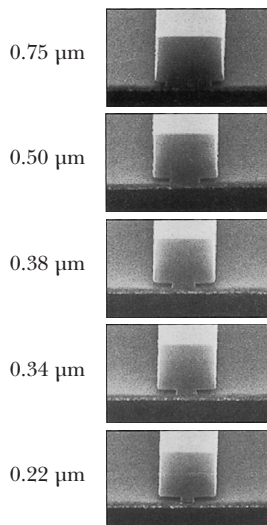
SUB: 1.00 mm Si with 1,100 Å XHRi-11 Brewer ARC  
 FT: 1.41  $\mu\text{m} \pm 25\text{\AA}$   
 SB: 100°C/90 sec. proximity hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54 $\sigma$ )  
 PEB: 110°C/90 sec. proximity hotplate  
 DEV: LDD-26W, 60 sec. SP @ 21°C  
 HB: As indicated, 3 min. contact hotplate

# MEGAPOSIT SPR955-CM SERIES PHOTORESIST

**Figure 11. Thin Film Head Application  
1.0 μm Isolated Lines**

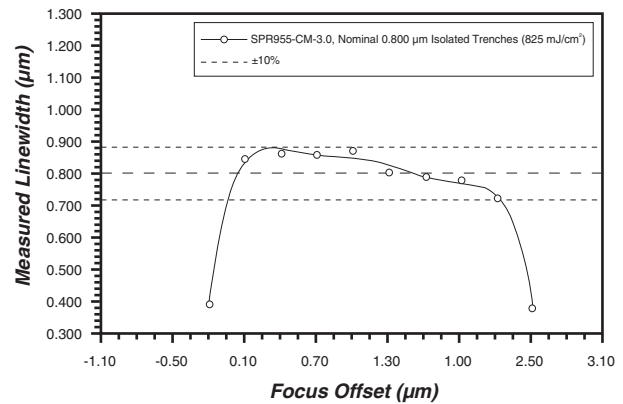
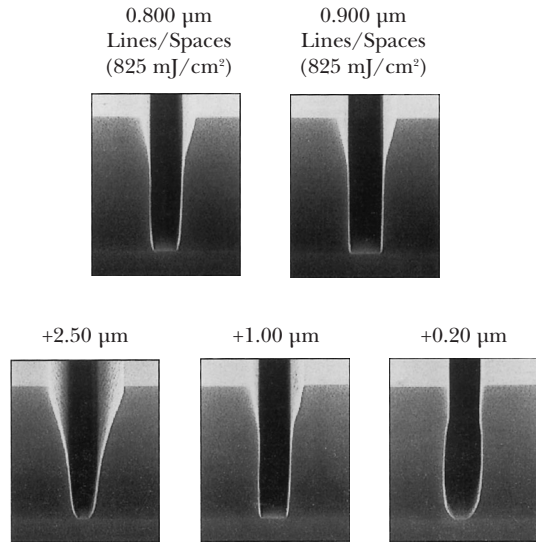


**Undercut CD Measurement**



SUB: 100 μm NiFe/850Å LOL™1000  
 FT: 0.80 μm ±25Å  
 SB: 90°C/120 sec. proximity hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54σ)  
 PEB: 115°C/60 sec. contact hotplate  
 DEV: LDD-26W, 40 sec. SP @ 21°C (TCU)

**Figure 12. High Energy Implant Application**



SUB: 100 mm Si  
 FT: 5.0 μm ±25Å  
 SB: 90°C/120 sec. contact hotplate  
 EXP: ASML PAS5500/200 (0.55 NA, 0.54σ)  
 PEB: 110°C/60 sec. proximity hotplate  
 DEV: MF-501, 30/30 sec. DSP @ 21°C

## MEGAPOSIT SPR955-CM SERIES PHOTORESIST

### HANDLING PRECAUTIONS

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product 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 Rohm and Haas Electronic Materials Technical Representative for more information.

# MEGAPOSIT SPR955-CM SERIES PHOTORESIST




## ELECTRONIC MATERIALS

  
Circuit Board Technologies

  
CMP Technologies

  
Flat Panel Display Technologies

  
Microelectronic Technologies

  
Packaging and Finishing Technologies

For locations and information please visit; <http://electronicmaterials.rohmhaas.com>

MEGAPOSIT, MF, SPR, Rohm and Haas, and Rohm and Haas Electronic Materials are trademarks of Rohm and Haas Company, Philadelphia, PA, USA, or its affiliates. PAS 5500 is a trademark of ASML. ARC is a trademark of Brewer Science, Inc.

### UNITED STATES

**Marlborough, MA**

Tel: 800.832.6200

Fax: 508.485.9113

### JAPAN

**Tokyo**

Tel: +81.3.5213.2910

Fax: +81.3.5213.2911

### ASIA

**Hong Kong**

Tel: +852.2680.6888

Fax: +852.2680.6333

### EUROPE

**Paris, France**

Tel: +33.1.40.02.54.00

Fax: +33.1.40.02.54.07

For Industrial Use Only. This information is based on our experience and is, to the best of our knowledge, true and accurate. However, since conditions for use and handling of products are beyond our control, we make no guarantee or warranty, expressed or implied, regarding the information, the use, handling, storage or possession of the products, or the applications of any process described herein or the results sought to be obtained. Nothing herein shall be construed as a recommendation to use any product in violation of any patent rights.