



# 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 μm front-end and back-end applications.

## ADVANTAGES

### 0.35 μm 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 mJ/cm<sup>2</sup> at 0.25 μm lines/spaces in 0.97 μm resist thickness
- 245 mJ/cm<sup>2</sup> at 0.40 μm lines/spaces in 1.40 μm resist thickness

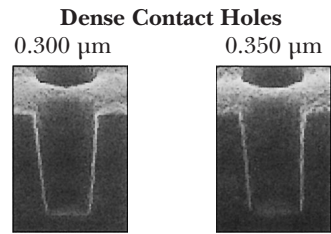
**Table 1. Recommended Process Conditions**

Contact Holes	
Thickness	0.70–1.20 μm
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**

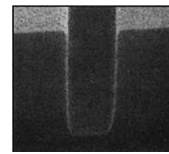
Lines/Spaces	
Thickness	1.00–2.30 μm
Softbake	100°C/90 sec. Proximity Hotplate
PEB	110°C/90 sec. Proximity Hotplate
Developer	Recommended for 0.26N; Compatible with 0.24N

**Figure 1.**



FT: 0.865 μm  
SUB: 3,000Å Silicon  
DEV: MF™-501 (0.24N)

**Isolated Trench**  
0.300 μm



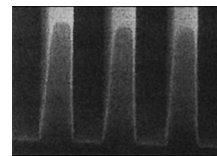
FT: 0.910 μm  
SUB: Si<sub>3</sub>N<sub>4</sub>  
DEV: MF-501 (0.24N)

**Dense and Isolated Lines/Spaces**  
0.325 μm Dense Lines/Spaces      0.250 μm Isolated Line



FT: 0.970 μm  
SUB: Polysilicon  
DEV: MF CD-26 (0.26N)

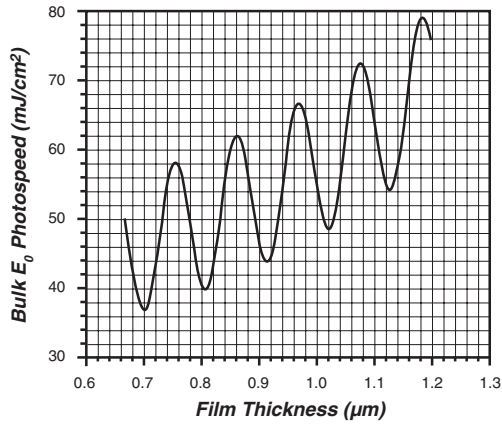
**Dense Metal Features**  
0.340 μm Dense Lines/Spaces



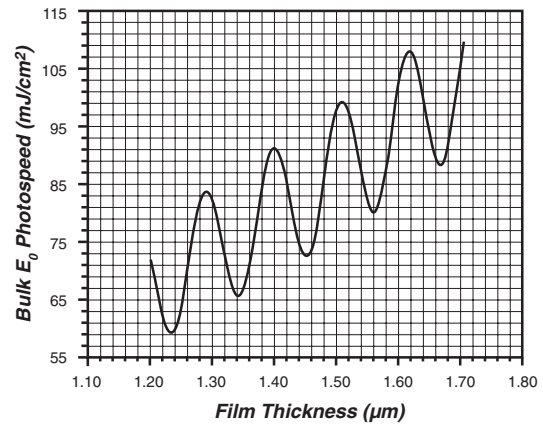
FT: 1.40 μm  
SUB: 400Å Titanium Nitride  
DEV: MF-501 (0.24N)

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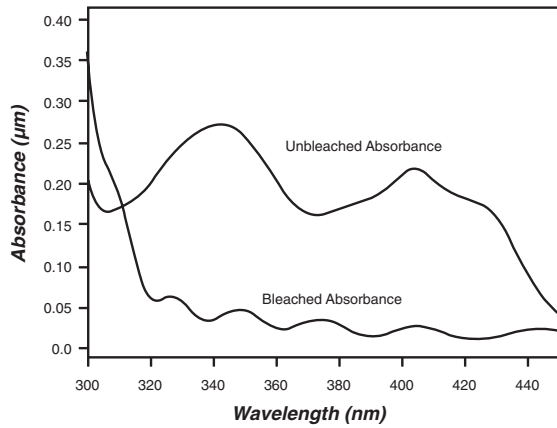
**Figure 2. Interference Curves on Silicon at 0.70–1.15  $\mu\text{m}$  Thickness**



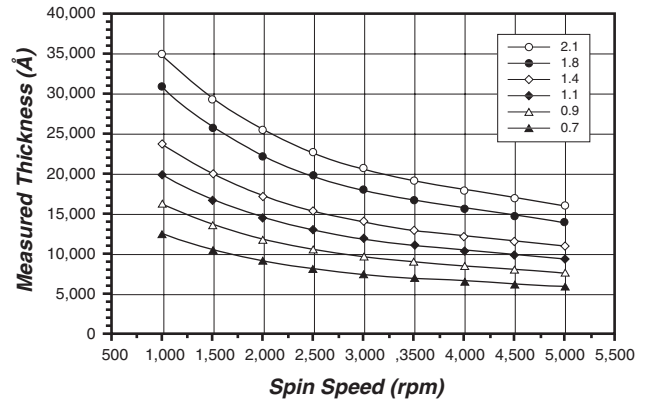
**Figure 4. Interference Curves on Silicon at 1.20–1.65  $\mu\text{m}$  Thickness**



**Figure 3. Absorbance Curves**



**Figure 5. Spin Speed Curve**



**Table 3. Cauchy Coefficients**

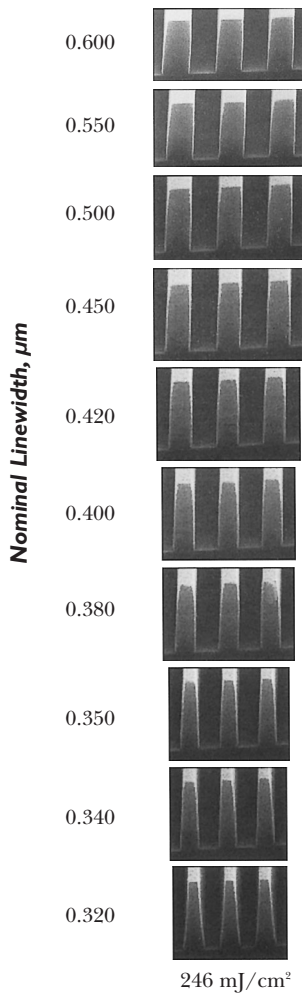
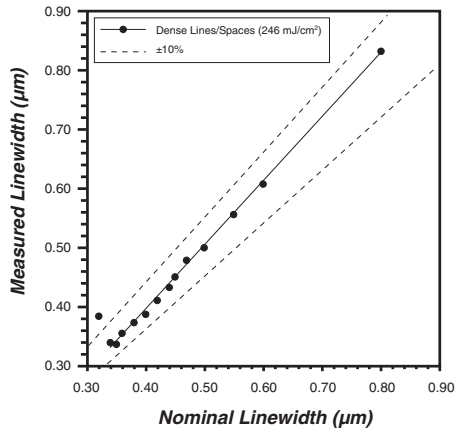
$n_1$	1.6463
$n_2$	-2.2496e+6
$n_3$	6.3448e+13

**Table 4. Dill Parameters**

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

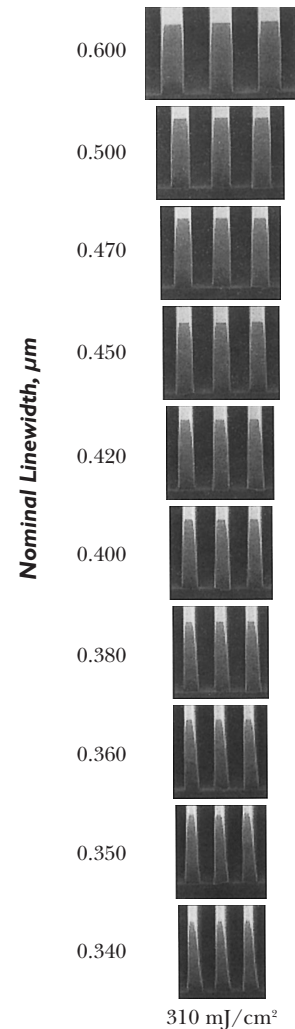
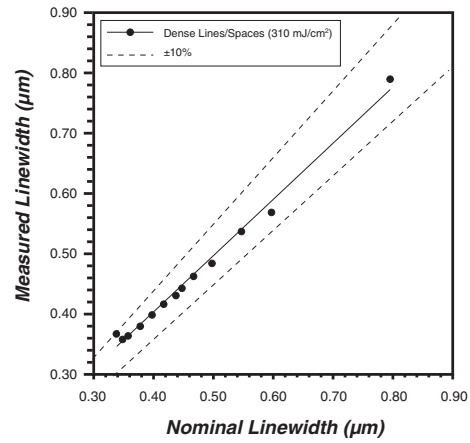
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Figure 6. Linearity for Dense Lines/Spaces at 1.4  $\mu\text{m}$



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

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Figure 8. Linearity for Isolated Trenches

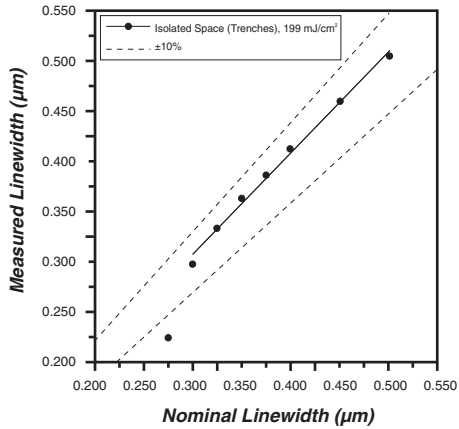
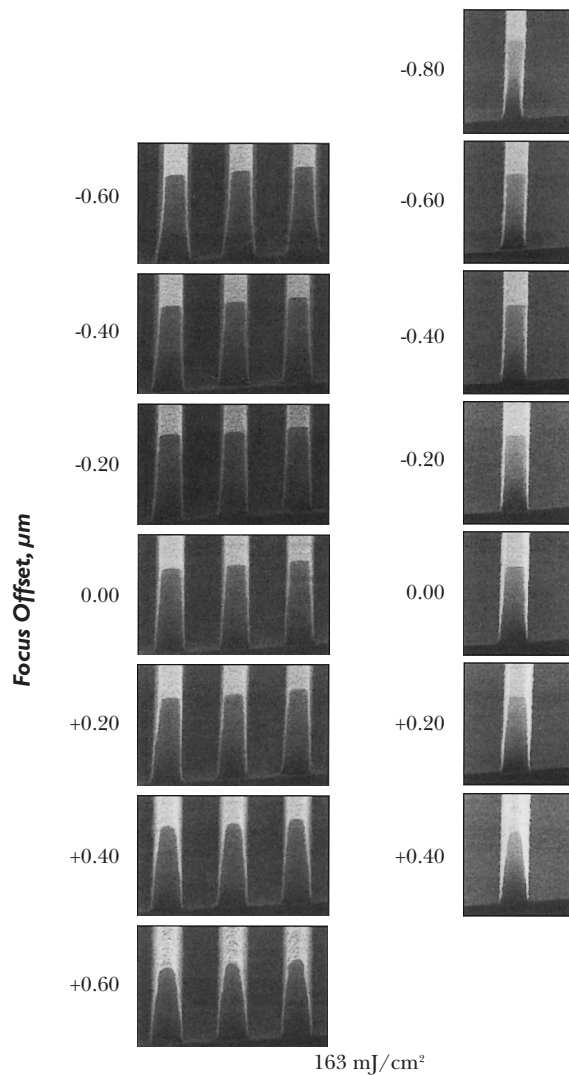
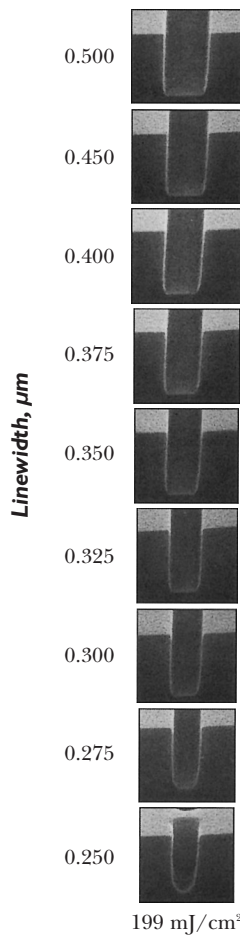
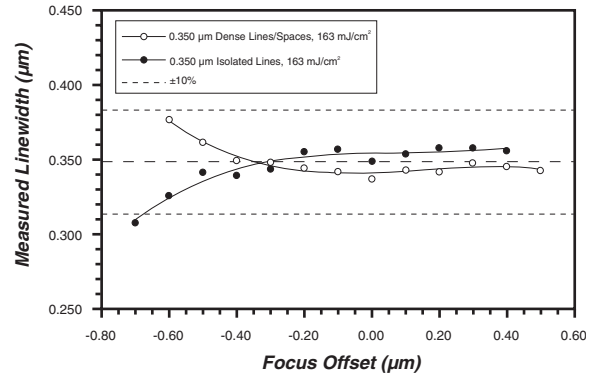


Figure 9. Focus Latitude for 0.350 µm Dense and Isolated Lines/Spaces

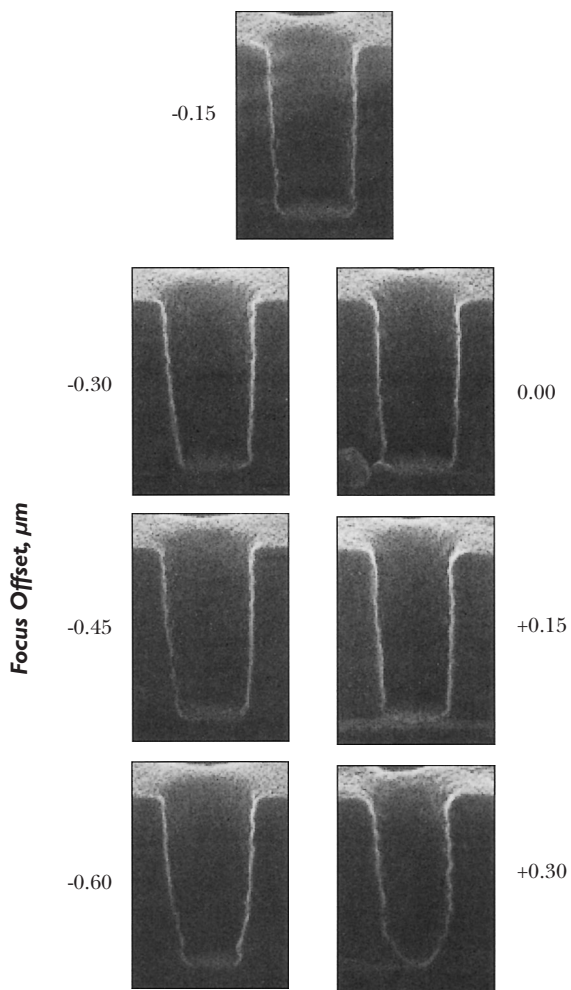
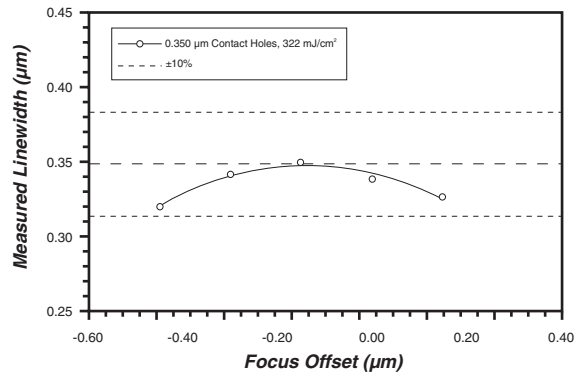


SUB: 3,000Å Si<sub>3</sub>N<sub>4</sub> on Si  
 FT: 9,100Å ±25Å  
 SB: 100°C/90 sec. contact hotplate  
 EXP: ASML PAS5500™/200 (0.55 NA, 0.65σ)  
 PEB: 110°C/90 sec. contact hotplate  
 DEV: MF CD-26, 60 sec. SP

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

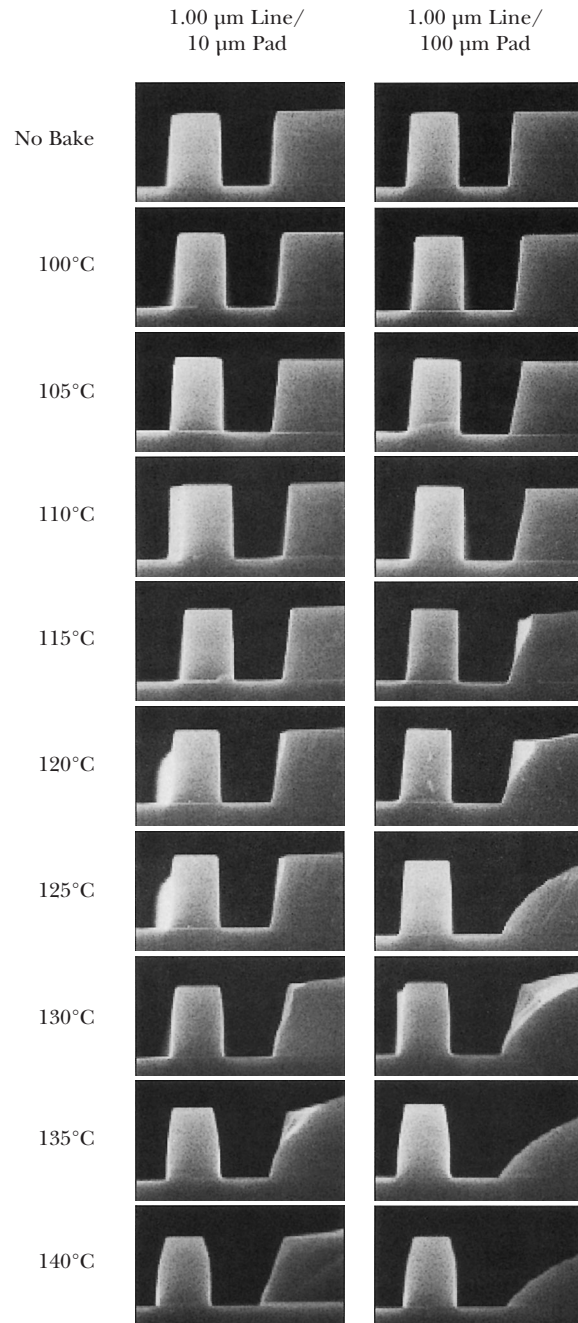
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Figure 10. Focus Latitude for 0.350  $\mu\text{m}$  Contact Holes



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)

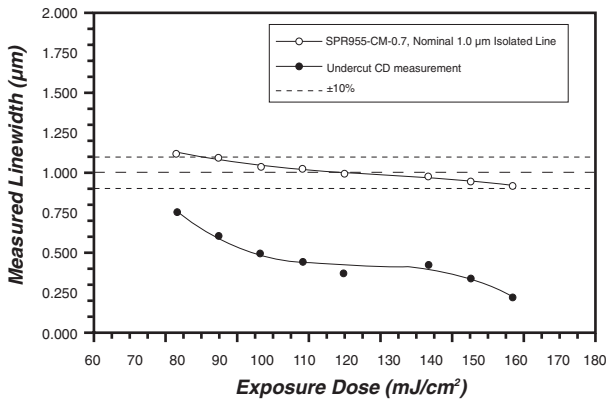
Figure 10. Thermal Flow Characteristics



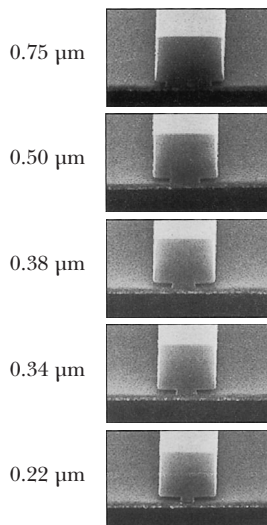
SUB: 1.00 mm Si with 1,100 Å XHRi-11 Brewer ARC  
 FT: 1.41  $\mu\text{m} \pm 25\text{\AA}$   
 SB: 100°C/90 sec. proximity hotplate  
 EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54 $\sigma$ )  
 PEB: 110°C/90 sec. proximity hotplate  
 DEV: LDD-26W, 60 sec. SP @ 21°C  
 HB: As indicated, 3 min. contact hotplate

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

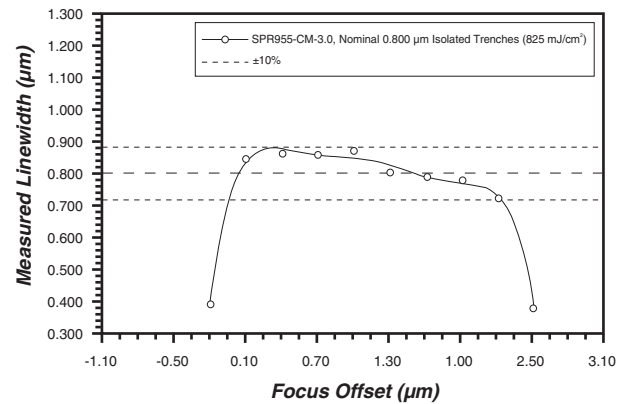
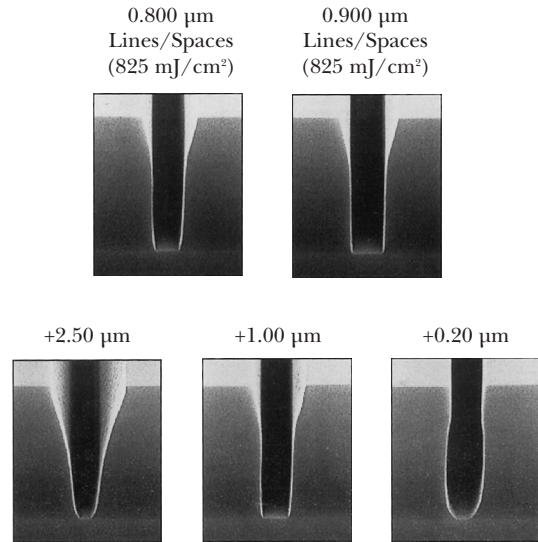


**Undercut CD Measurement**



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

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### 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.

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## ELECTRONIC MATERIALS

 Circuit Board Technologies

 CMP Technologies

 Flat Panel Display Technologies

 Microelectronic Technologies

 Packaging and Finishing Technologies

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