ELECTRONIC MATERIALS
MICROELECTRONIC TECHNOLOGIES

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/cm² at 0.25 µm lines/spaces in 0.97 µm resist thickness
- 245 mJ/cm² 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

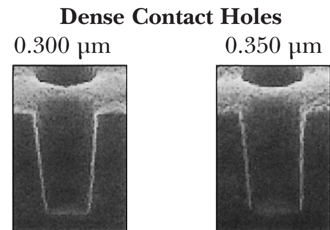
Table 2. Recommended Process Conditions

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.

Dense Contact Holes

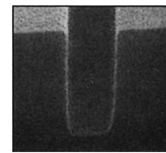
0.300 µm 0.350 µm



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

Isolated Trench

0.300 µm



FT: 0.910 µm
SUB: Si_3N_4
DEV: MF-501 (0.24N)

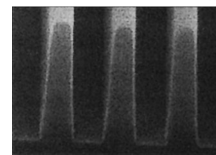
Dense and Isolated Lines/Spaces

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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ME04N117, Rev. 0
July 2006

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Figure 2. Interference Curves on Silicon at 0.70–1.15 µm Thickness

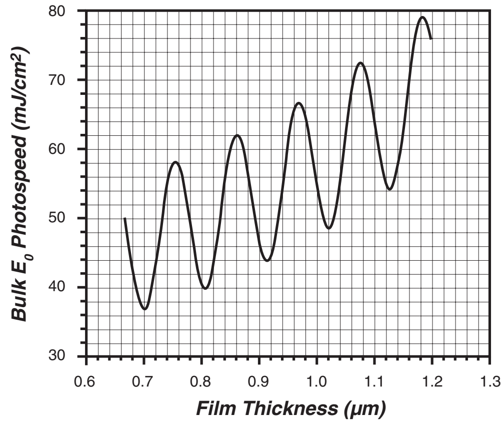

Figure 4. Interference Curves on Silicon at 1.20–1.65 µm Thickness

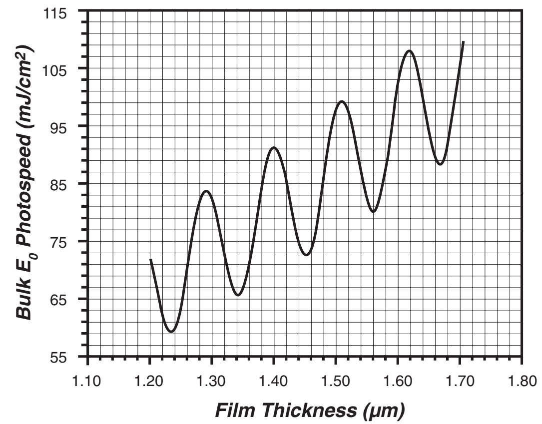

Figure 3. Absorbance Curves

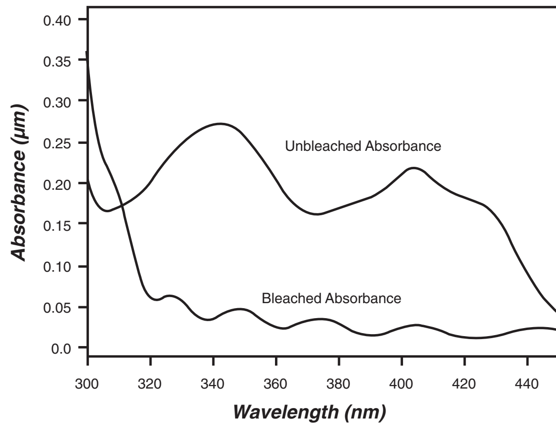

Figure 5. Spin Speed Curve

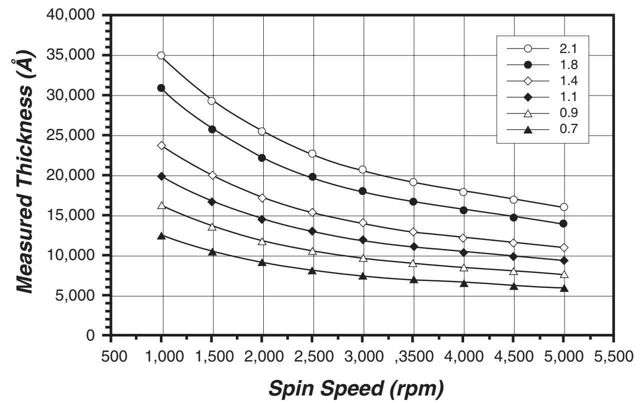

Table 3. Cauchy Coefficients

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

Table 4. Dill Parameters

Dill A Value	0.76 µm-1
Dill B Value	0.05 µm-1

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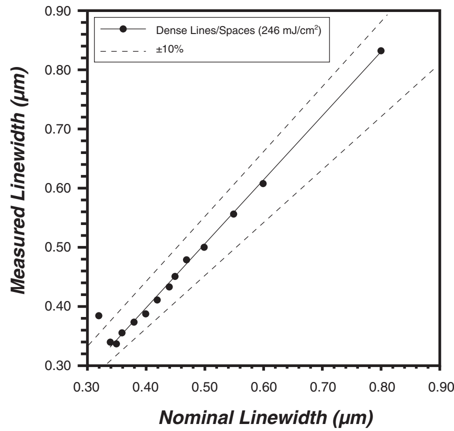
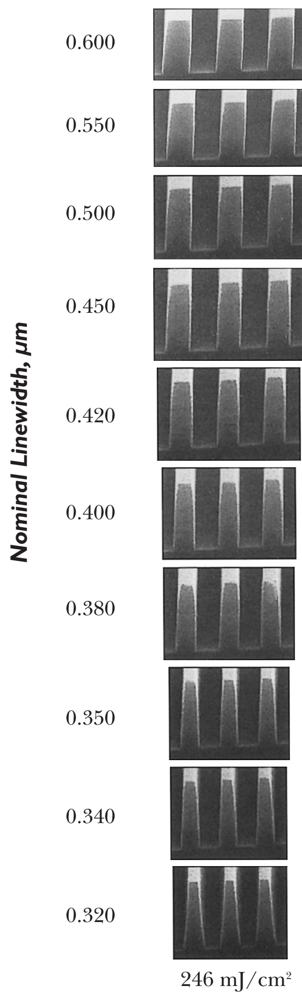
Figure 6. Linearity for Dense Lines/Spaces at 1.4 µm





SUB: 400Å TiN over 100 nm silicon

FT: 1.40 µm ±50Å

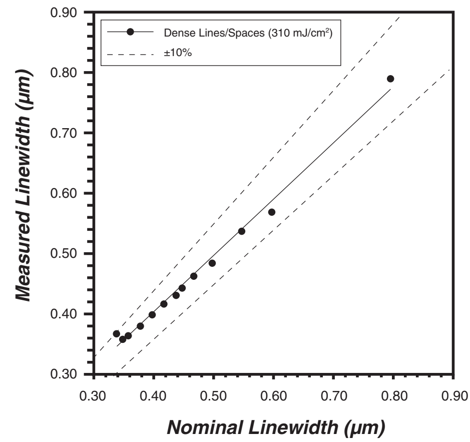
SB: 100°C/60 sec. contact hotplate

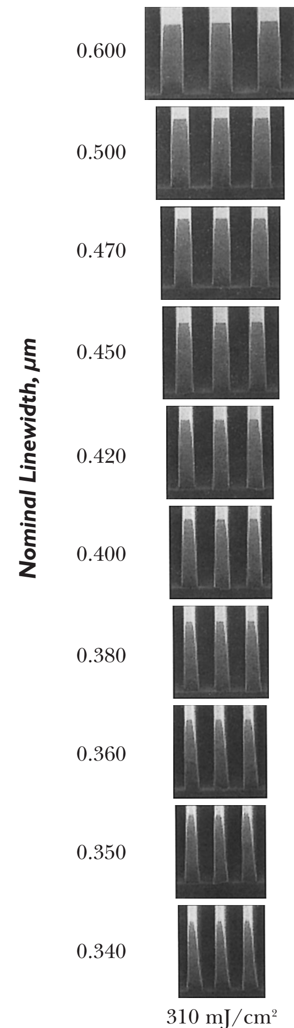
EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54σ)

PEB: 110°C/60 sec. contact hotplate

DEV: MF-701, 60 sec. SP

Figure 7. Linearity for Dense Lines/Spaces at 1.8 µm





SUB: 100 nm on Si, 1,600Å Brewer BARC

FT: 1.80 µm ±50Å

SB: 100°C/90 sec. contact hotplate

EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54σ)

PEB: 110°C/60 sec. contact hotplate

DEV: MF-501, 60 sec. SP

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Figure 8. Linearity for Isolated Trenches

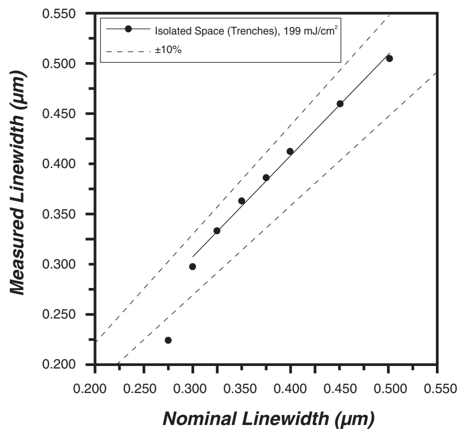
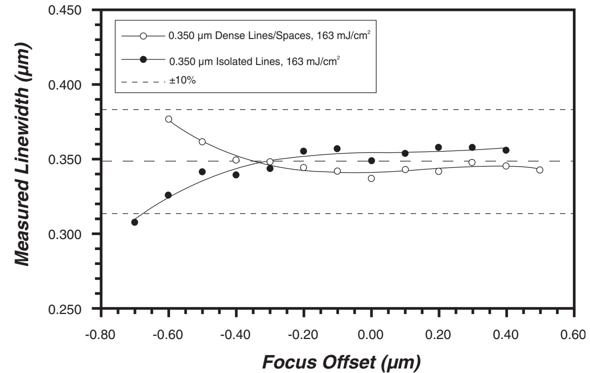
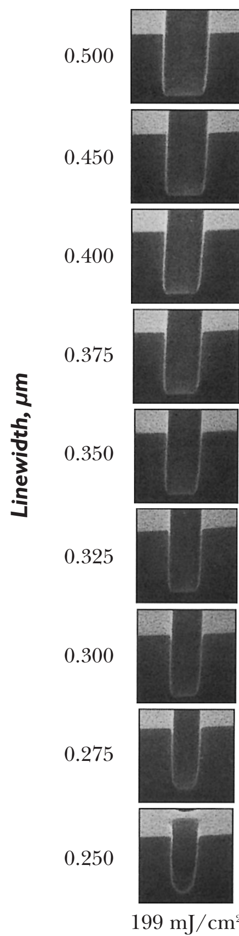
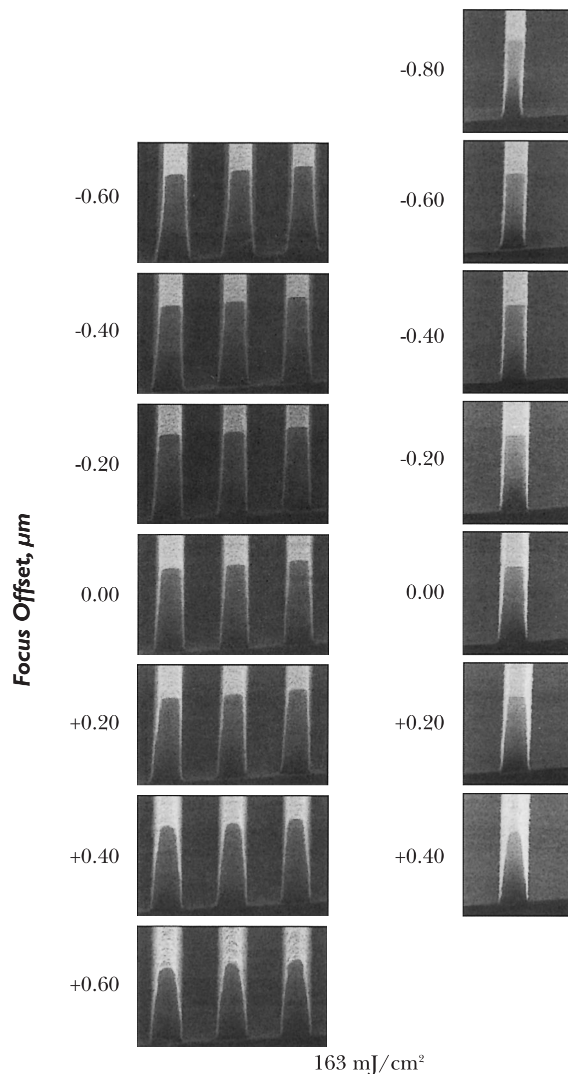


Figure 9. Focus Latitude for 0.350 μm Dense and Isolated Lines/Spaces



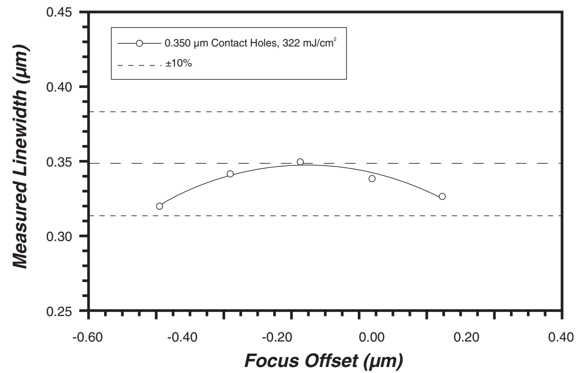


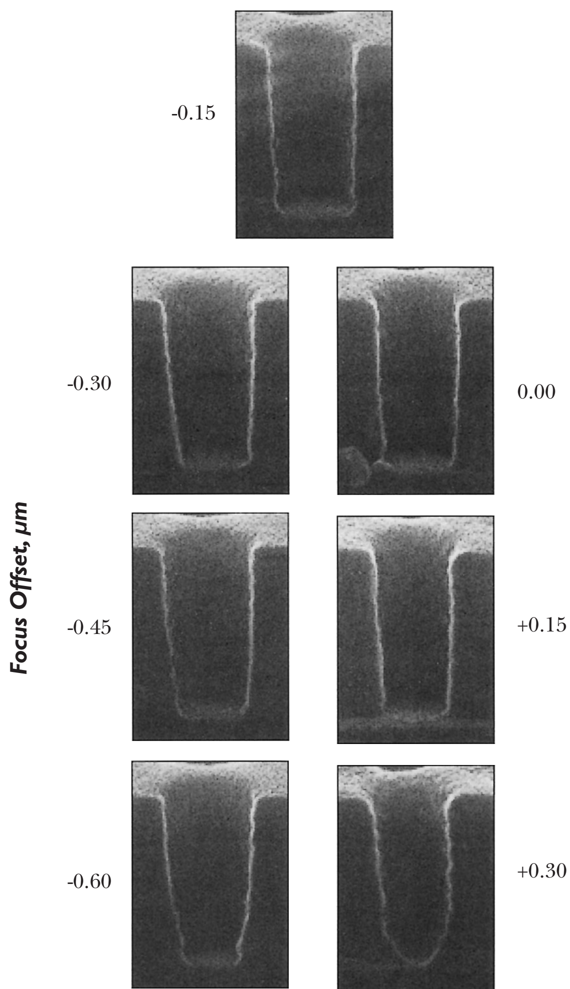
SUB: 3,000Å Si_3N_4 on Si
FT: 9,100Å ±25Å
SB: 100°C/90 sec. contact hotplate
EXP: ASML PAS5500™/200 (0.55 NA, 0.65σ)
PEB: 110°C/90 sec. contact hotplate
DEV: MF CD-26, 60 sec. SP



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

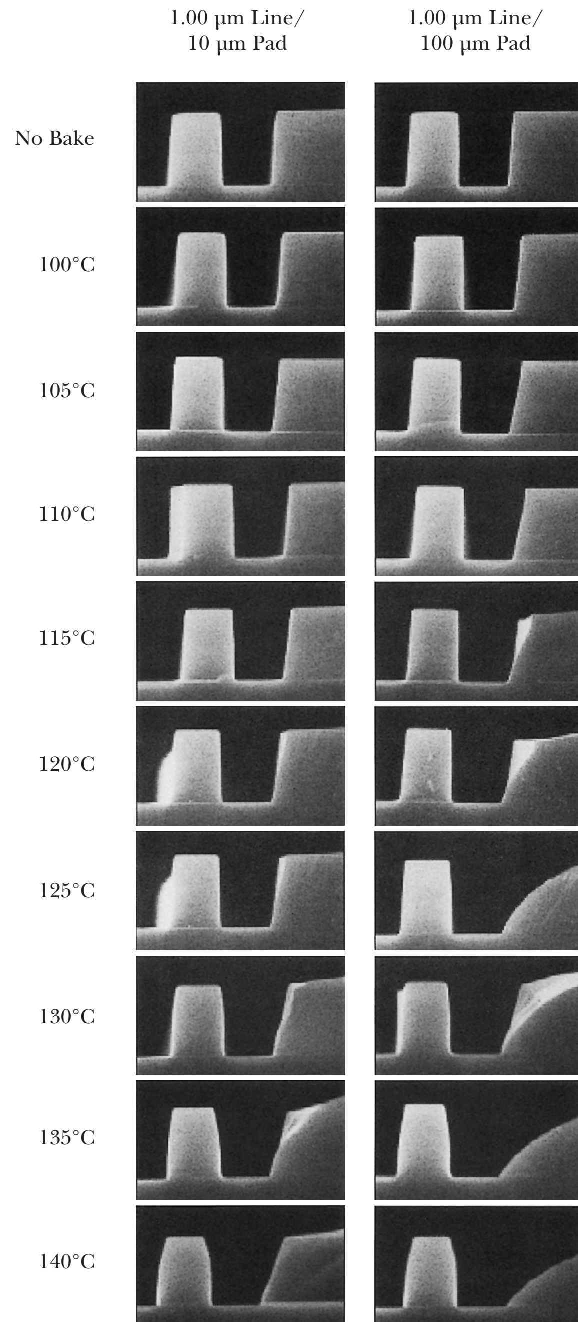
Figure 10. Focus Latitude for 0.350 µm Contact Holes





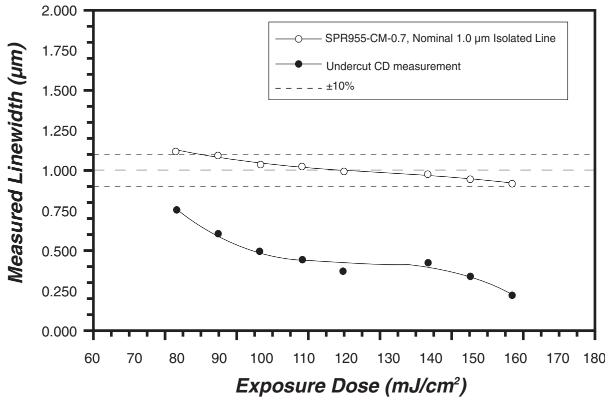
SUB: 1.00 mm Si with 1,100Å XHRi-11 Brewer ARC
FT: 8.65 µm ±25Å
SB: 90°C/60 sec. contact hotplate
EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54σ)
PEB: 110°C/60 sec. contact hotplate
DEV: MF CD-26, 30 sec. SP @ 21°C (TCU)

Figure 10. Thermal Flow Characteristics

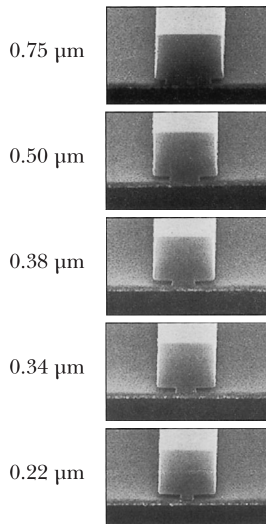


SUB: 1.00 mm Si with 1,100 Å XHRi-11 Brewer ARC
FT: 1.41 µm ±25Å
SB: 100°C/90 sec. proximity hotplate
EXP: GCA XLS 7500 i-Line (0.55 NA, 0.54σ)
PEB: 110°C/90 sec. proximity hotplate
DEV: LDD-26W, 60 sec. SP @ 21°C
HB: As indicated, 3 min. contact hotplate

Figure 11. Thin Film Head Application
1.0 µm Isolated Lines

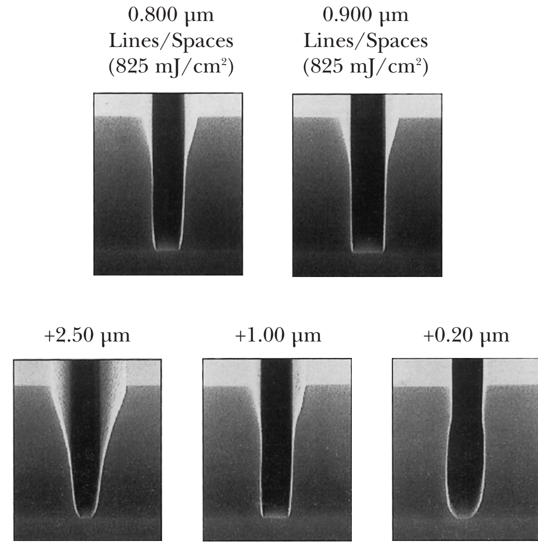


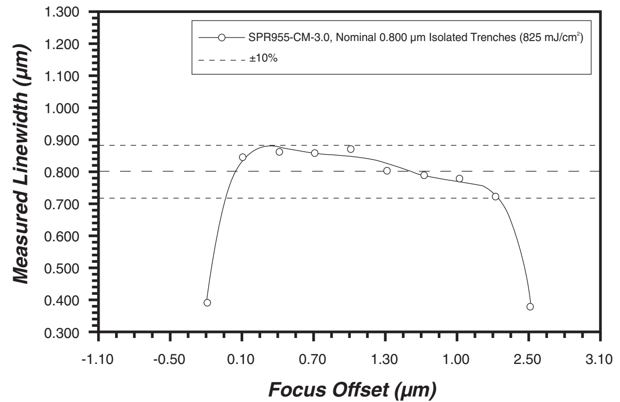
Undercut CD Measurement



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

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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