

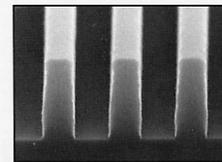
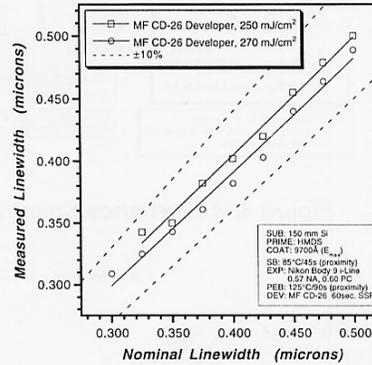
MEGAPOSIT® SPR®950 SERIES PHOTO RESIST meets the needs of critical layer i-Line resist applications, such as microprocessor, memory and custom or ASIC fabrication. SPR950 is an advanced resist capable of 0.35–0.30  $\mu\text{m}$  production design rules. SPR950 performs well in 0.26N and 0.24N developers, both with and without surfactant. SPR950 is formulated to be compatible with BARC (bottom anti-reflective coating). As with all Shipley i-Line photoresists, SPR950 has been formulated with safer solvent alternatives. Key features of this resist are:

- Ultimate resolution of 0.28  $\mu\text{m}$  dense lines/spaces and <0.25  $\mu\text{m}$  isolated lines
- Depth-of-focus for 0.30  $\mu\text{m}$  lines/spaces of 1.0  $\mu\text{m}$  and 0.35  $\mu\text{m}$  contact holes up to 1.3  $\mu\text{m}$
- Energy to size for 0.35  $\mu\text{m}$  Lines/Spaces ranging from 180–250  $\text{mJ}/\text{cm}^2$ , depending on process and equipment used
- Thermal stability  $\leq 125^\circ\text{C}$  for 10  $\mu\text{m}$  pad

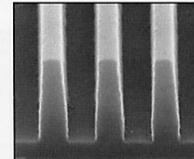
Recommended Process Conditions on Silicon	
Substrate	100 mm Silicon
Resist	SPR950-1.0
Thickness	8,600 Å or 9,700 Å (E max)
Softbake	85°C for 45 sec. Proximity Hotplate
Exposure	i-Line Stepper (0.48–0.60 NA)
PEB	125°C for 90 sec. Proximity Hotplate
Developer	LDD-26W (0.26N), MF CD-26 (0.26N) or MF-701 (0.24N) 60 sec. SSP @ 21°C

Recommended Process Conditions on BARC	
Substrate	Bottom Anti-Reflective Coating (BARC)
Resist	SPR950-1.0
Thickness	8,600 Å or 9,700 Å (E max)
Softbake	100°C for 60 sec. Proximity Hotplate
Exposure	i-Line Stepper (0.48–0.60 NA)
PEB	115°C for 90 sec. Proximity Hotplate
Developer	LDD-26W (0.26N), MF CD-26 (0.26N) or MF-701 (0.24N) 60 sec. SSP @ 21°C

**Figure 1. SPR950 Linearity**

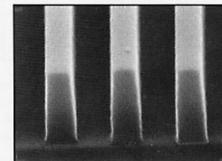


0.35  $\mu\text{m}$  L/S (250  $\text{mJ}/\text{cm}^2$ )



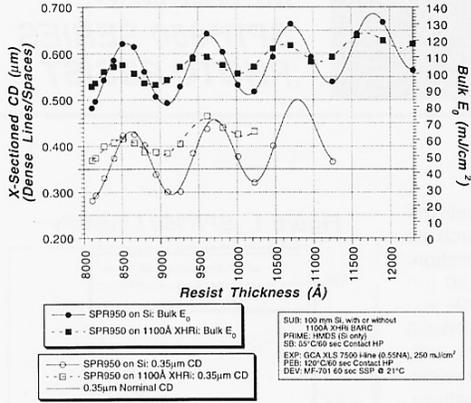
0.30  $\mu\text{m}$  L/S (270  $\text{mJ}/\text{cm}^2$ )

**Figure 2. SPR950 on Brewer XHR® BARC**

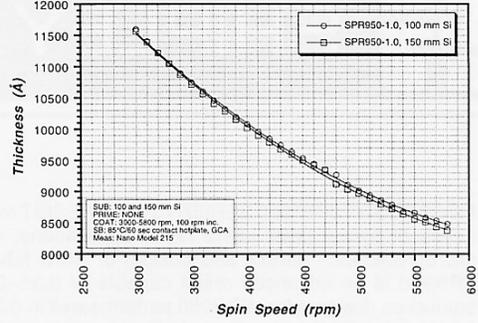


0.35  $\mu\text{m}$  L/S

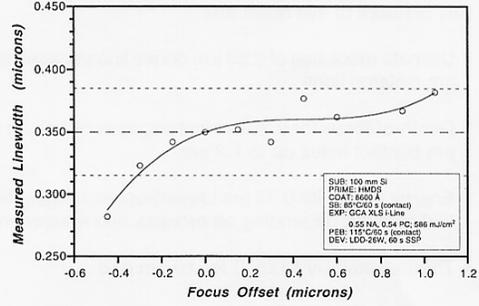
**Figure 3. Bulk E<sub>0</sub> & CD Swing Curve**



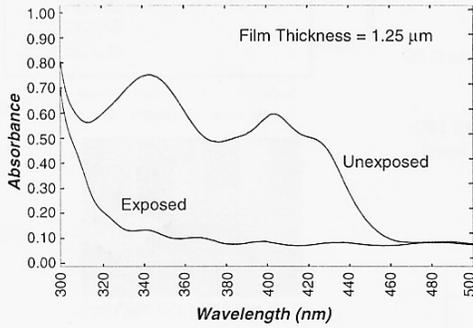
**Figure 5. Spin Speed Curve**



**Figure 6. Focus Latitude 0.35 µm Contact Holes**



**Figure 4. Absorbance Spectrum**



**Table 1. Dill Parameters**

	$\lambda = 365 \text{ nm}$
Dill A	$0.87 \mu\text{m}^{-1}$
Dill B	$0.04 \mu\text{m}^{-1}$

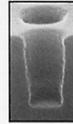
**Table 2. Cauchy Coefficients and Refractive Index**

$n_1$	$n_2$	$n_3$	Refractive Index @ 365 nm
1.601	1.10e+6	6.3e+12	1.70

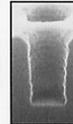
+0.30



0.00



+0.60



-0.30



+0.90



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