



MEGAPOSIT™ SPR 350 SERIES PHOTORESIST

For Mid-Critical - i Line Applications

DESCRIPTION

SPR350 is an advanced mid-critical photoresist designed to give high throughput. SPR350 is developed as a multi-wavelength, all purpose photoresist ideal for mix and match applications. The SPR350 product family can be used for Line/Space and Contact Hole applications on a variety of substrates, including Silicon, Silicon-Dioxide, Nitride (SiN), and reflective Polysilicon/Metal substrates.

The SPR350 product family is PFOS free and is available in both dyed and un-dyed versions. It offers excellent resolution with very good feature profiles for Line/Space, Trench, and Contact Hole applications. SPR350 also performs well with Dry Etch, Wet Etch, and Implant processes, and can be used as a consolidation photoresist.

FEATURES

- High Throughput Mid-Critical Photoresist
- Very Good Process Latitude
- Excellent Wet/Dry Etch Performance
- Consolidation Resist for i-Line, g-Line, Widefield/Broadband
- A Range of Dyed versions to help on reflective substrates

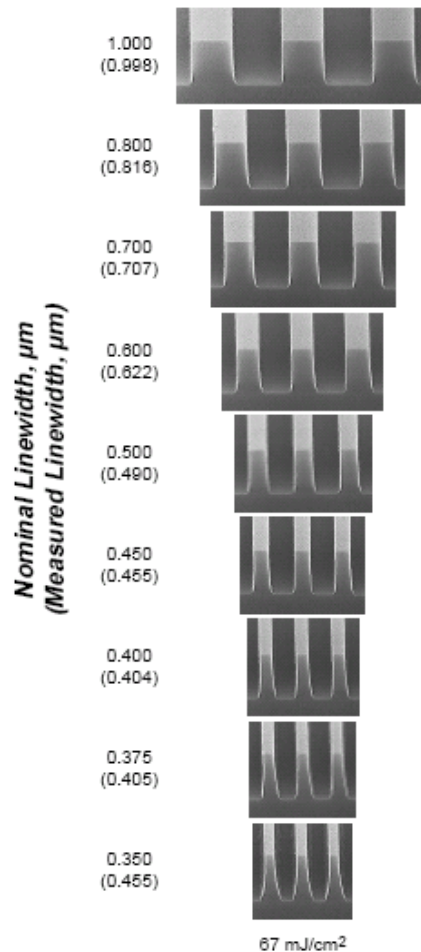
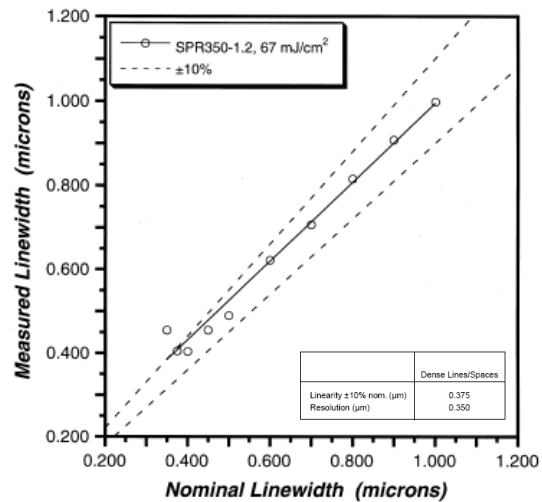
LITHOGRAPHIC PERFORMANCE

- Resolution:
 - 350nm for Dense 500nm 1:1Line/Space
 - 375nm for Dense 500nm 1:1Line/Space (+/- 10%)
- Sizing Energy:

- i-Line	67mJ/cm ²
- g-Line	125mJ/cm ²
- Widefield/Broadband	105mJ/cm ²
- Depth of Focus:
 - ~1.2μm for 500nm Dense Line/Space
 - >1.6μm for 700 nm Dense Line/Space
- Exposure Latitude:
 - >23% for 500nm Dense Line/Space
 - 45% for 700nm Dense Line/Space

See Figure 3 (page-3) for lithographic performance and Table 1 (next page) for recommended process conditions.

Figure 1. Linearity & Resolution



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Table 1. Recommended Process Conditions

	Line/Space & Trench	Contact Hole
Thickness	~8,000Å to 13,000Å	~8,000Å to 13,000Å
Softbake	90°C/90 sec. Proximity Hotplate	90°C/90 sec. Proximity Hotplate
PEB	110°C/90 sec. Proximity Hotplate	120°C/90 sec. Proximity Hotplate
Developer	MFCD-26 or MF-26A @ 22°C, 30-60 sec. single puddle	MFCD-26 or MF-26A @ 22°C, 30-60 sec. single puddle

Note: All data shown within this flyer used the process conditions listed above unless otherwise stated. Please consult your local Rohm & Haas representative about alternative processing conditions.

SUBSTRATE

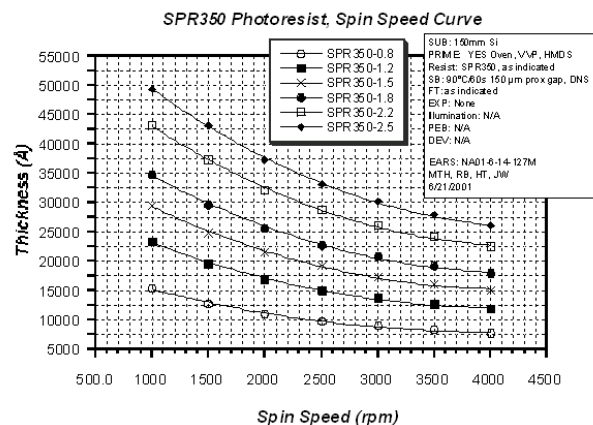
SPR350 is compatible with a wide range of substrates, including but not limited to Silicon, SiO₂, Polysilicon, Nitride, and Reflective Metal Substrates.

A hexamethyldisilazane (HMDS) based MICROPOSIT primer is recommended to promote adhesion with substrates that require such treatment. Vacuum vapor priming at 120°C for 30 seconds with concentrated HMDS is recommended.

COAT

Figure 2 shows the relationship between spin speed and resist thickness for silicon substrates. Nominal film thickness may vary slightly due to process, equipment, and ambient conditions. Table 3 shows the cauchy coefficients for resist thickness measurement.

Figure 2. Spin Speed Curve SPR350 Photoresist



Note: Other Viscosities are available as well as dyed versions.

Table 3. Cauchy Coefficients - SPR350

n_1	1.604
n_2	7.4×10^5
n_3	1.4×10^{13}

SOFTBAKE

See Table 2 for recommended softbake conditions.

Table 2. Softbake Process Conditions

Temperature	90°C
Time	90 sec. Proximity Hotplate (150 µm) 60 sec. Contact Hotplate

EXPOSE

SPR350 is sensitive to i-Line & g-Line exposure wavelengths and can be used as a multi-wavelength cross over photoresist ideal for consolidating processes & reducing the number of photoresists used. It also performs very well on Widefield g/h-Line & Broadband exposure tools.

POST-EXPOSURE BAKE

The recommended PEB conditions for SPR350 on reflective and non-reflective substrates are listed Table 4. For some Trench and Contact Hole applications a higher Temperature of 120°C may be of advantage.

Table 4. Post Exposure Bake Process Conditions

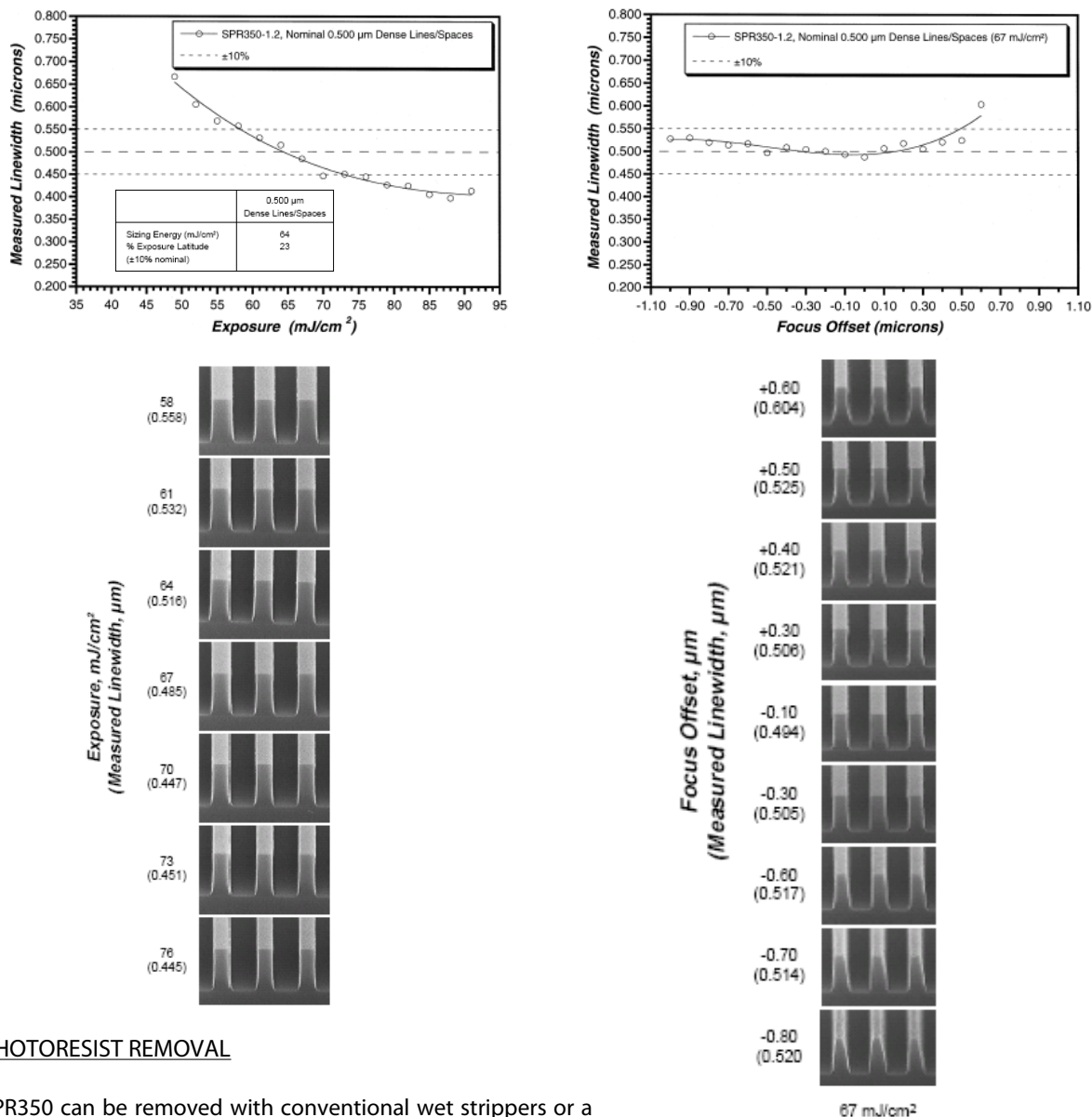
Thickness	8,000Å to 13,000Å
Temperature	110°C
Time	90 sec. Proximity, Hotplate (150 µm)

DEVELOP

SPR350 is optimized for 0.26N developers. A 30-60 second single puddle with no pre-wet is recommended for most applications, including dense line/spaces, semi-dense lines/spaces, and isolated lines. This can be adjusted to improve Develop track throughput.

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Figure 3. Lithographic Performance (Process Window 500nm 1:1 Dense Line/Space)



PHOTORESIST REMOVAL

SPR350 can be removed with conventional wet strippers or a dry plasma strip. Rohm & Haas has a range of wet resist strippers capable of removing SPR350 contact your local sales representative for more information on these products.

HANDLING PRECAUTIONS CAUTION!

SPR350 is a combustible liquid containing various solvents. Handle with care. Ground and bond all containers when handling or transferring combustible materials.

Contact with eyes, skin and mucous membranes can cause irritation. In case of eye or skin contact, flush affected areas with plenty of water for at least 15 minutes. If irritation persists, contact your physician immediately. Avoid breathing vapors or mists. Use with adequate ventilation. It is highly recommended that during handling chemical goggles, chemical gloves and protective clothing be worn.

Please consult the Materials Safety Data Sheet prior to use.

WASTE TREATMENT

SPR350 contains various solvents and may be included with other wastes containing similar organic solvents to be discarded for destruction or reclaim in accordance with local, authorities, and EU regulations.

It is your responsibility to ensure the disposal of SPR350 and residues therefrom is made in compliance with all applicable environmental regulations.

STORAGE

Recommended storage for SPR350 is in an upright position in a dry area at 4-15°C (40-60°F). Keep away from oxidizers, acids, and bases. Keep container sealed when not in use. The shelf life for SPR350 is 12 months based on these conditions.

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Circuit Board Technologies



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