Distribution Products Part 1

micro resist technology

Gesellschaft für chemische Materialien spezieller Photoresistsysteme mbH

# Distribution Products Part 1

- ⇨ **g-line • i-line • DUV - Resists**
- ⇨ **Lift-off Resist**
- ⇨ **E-Beam Resist**
- ⇨ **Chrome Etchant (OSC)**

## Distributor for Rohm and Haas Electronic Materials Europe Ltd. (GB)



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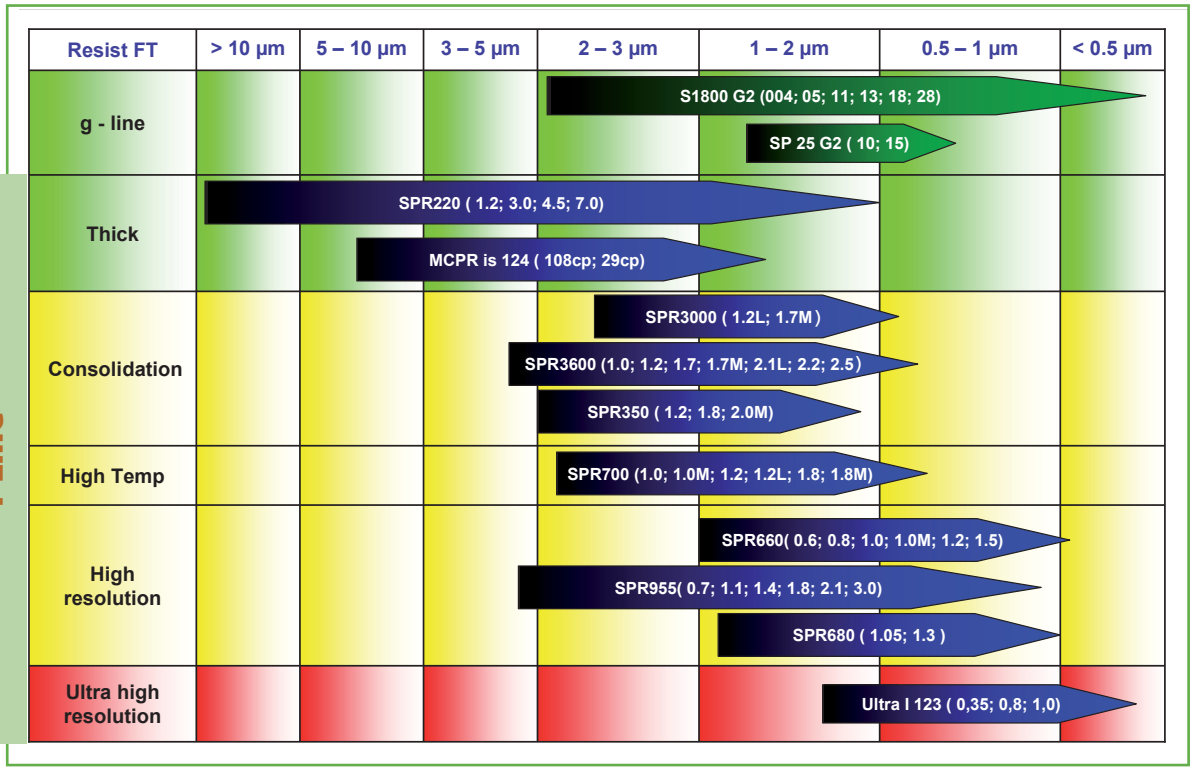
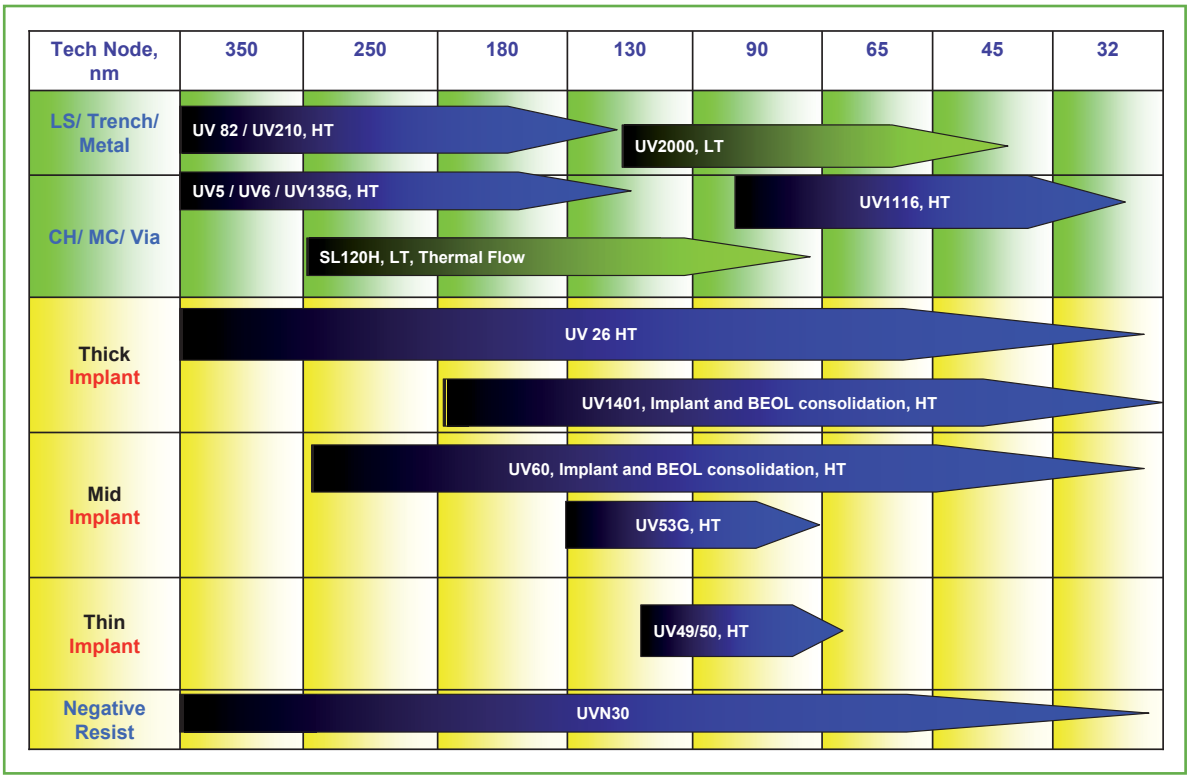
## RHEM • g-Line and i-Line Products – Overview vs. Film Thickness

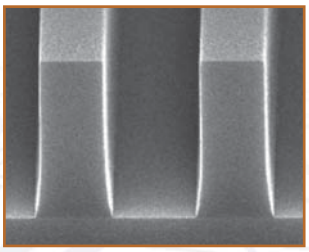



## RHEM • DUV Products – Overview vs. Technical Node

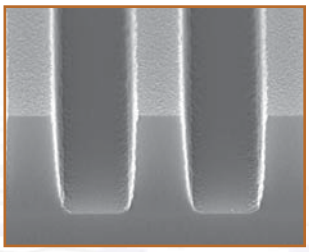


## Resist Series S1800 G2

| Resist | S1828 G2 | S1818 G2 (SP16) | S1813 G2 (SP15) | S1811 G2 | S1805 G2 | S1800 -4 G2 |
|---|---|---|---|---|---|---|
| Film thickness @ 4000 rpm | 2.8 µm | 1.8 µm | 1.3 µm | 1.1 µm | 0.5 µm | 67 nm |
| Viscosity / cSt | 88.5 | 39.4 | 25 | 15 | 5.3 | 1.5 |
| Dose (Broadband) | 300 mJ | 200 mJ | 160 mJ | 140 mJ | 100 mJ | - |



4 µm Ft/ 2 µm L/S 310 mJ



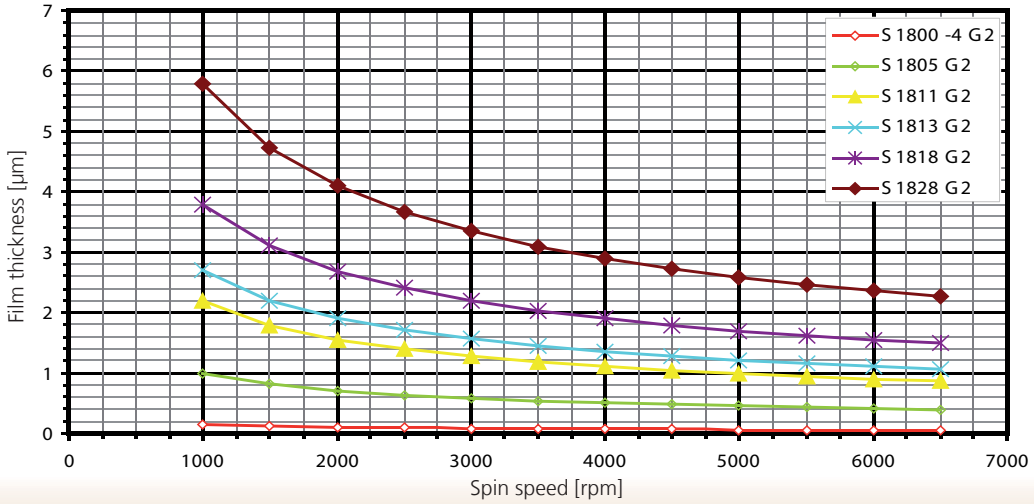
1.3 µm Ft/ 0.8 µm L/S 180 mJ

**S1800G2**
For Microlithography Applications

**MICROPOSIT S1800 G2** series photoresist are positive photoresist systems engineered to satisfy the microelectronics industry's requirements for IC device fabrication. The system has been engineered using a toxicologically – safer alternative casting solvent to the ethylene glycol derived ether acetates.

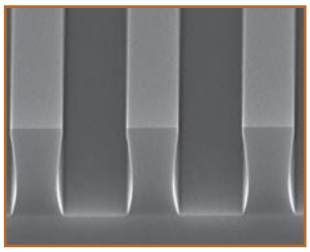
### Advantages

- Optimized for **g-line & i-line exposure**
- Effective for broadband exposure
- Excellent adhesion ( Improved with SP )
- PFOS / PFOA – free
- Optimized for use with MF-319 metal-ion-free developer family
- Compatible with metal-ion-bearing developers

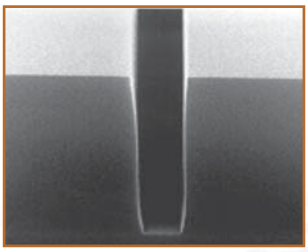


# Resist Series SPR220

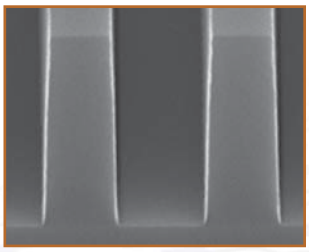
| Resist | SPR220-7.0 | SPR220-4.5 | SPR220-4.0 | SPR220-3.0 | SPR220-1.0 |
|---|---|---|---|---|---|
| Film thickness @ 3000 rpm | 7.0 µm | 4.5 µm | 4.0 µm | 3.0 µm | 1.2 µm |
| Viscosity / cSt | 390 | 124 | 84 | 49 | 11.5 |
| Dose ( i-line) | 470 mJ | 380 mJ | 350 mJ | 310 mJ | 160 mJ |

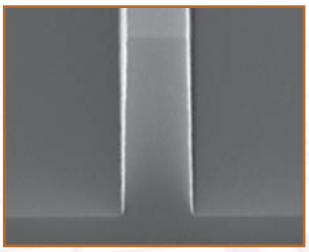


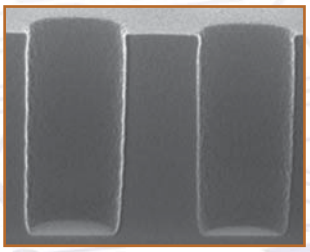
8 µm Ft/ 5 µm L/S 310 mJ



4.3 µm Ft/ 0.8 µm L/S 440 mJ







3.0 µm Ft/ 1.0 µm L/S 220 mJ

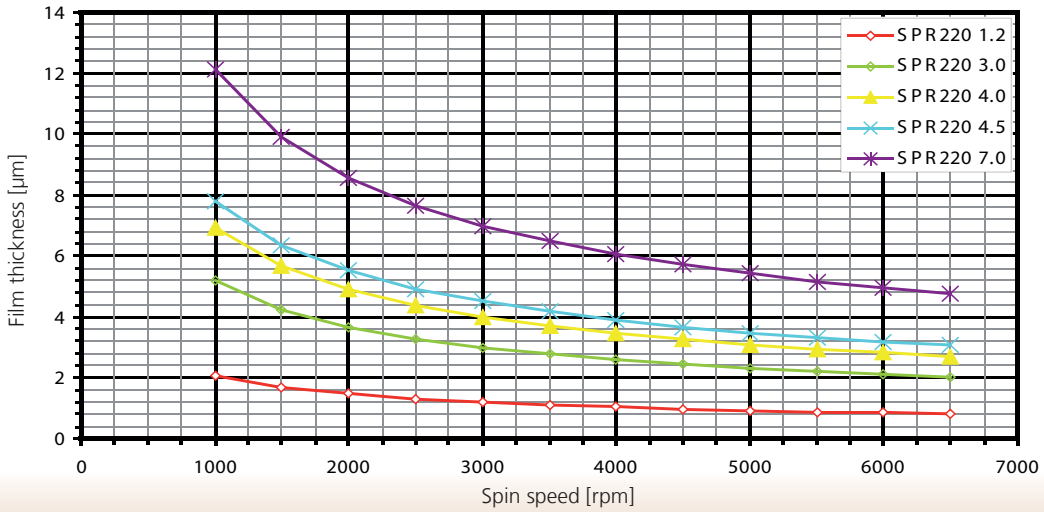
## SPR220

For Microlithography Applications

**MEGAPOSIT SPR220** i-line photoresist is an optimized general-purpose, multi-wavelength resist designed to cover a wide range of film thicknesses, 1-30 µm, with a single-coat process. MEGAPOSIT SPR220 photoresist also has excellent adhesion and plating characteristics, which make it ideal for such thick film applications as MEMS and bump process.

### Advantages

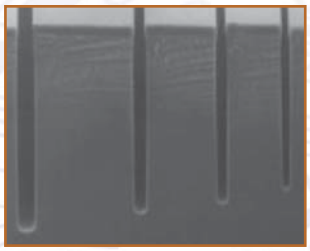
- Broadband, g-line and i-line capable
- >10µm film thickness in a single coat with good uniformity
- Excellent wet and dry etch adhesion
- Au; Cu and Ni/Fe plating without cracking
- MIF and MIB developer compatible



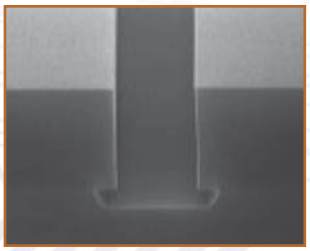
# Resist Series SPR220 – Thick Application

| Recommended Process Conditions | | |
|---|---|---|
| | *1.1 µm to 4.0 µm Thickness** | *1.1 µm to 10.0 µm Thickness** |
| Thickness:<br>Softbake:<br>Expose:<br>PEB:<br>Developer: | 1.1 µm – 4.0 µm<br>115°C/ 90 sec. Contact hotplate<br>ASML PAS 5500/ 200 i-Line (0.48 NA, 0.50 σ)<br>115°C/ 90 sec. Contact hotplate<br>MF™- 24 A @ 21°C, 60 sec.<br>single spray puddle | 1.1 µm – 10.0 µm<br>30 sec. step down to 115°C/ 90 sec. Contact hotplate**<br>ASML PAS 5500/ 200 i-Line (0.48 NA, 0.50 σ)<br>115°C/ 90 sec. Contact hotplate<br>MF™- 24 A @ 21°C, 60 sec.<br>single spray puddle |

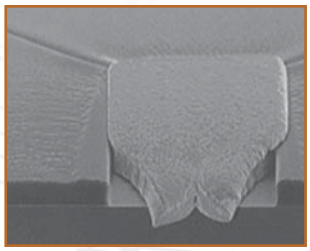
* Recommended for isolated spaces as well ** Refer to datasheet for further details



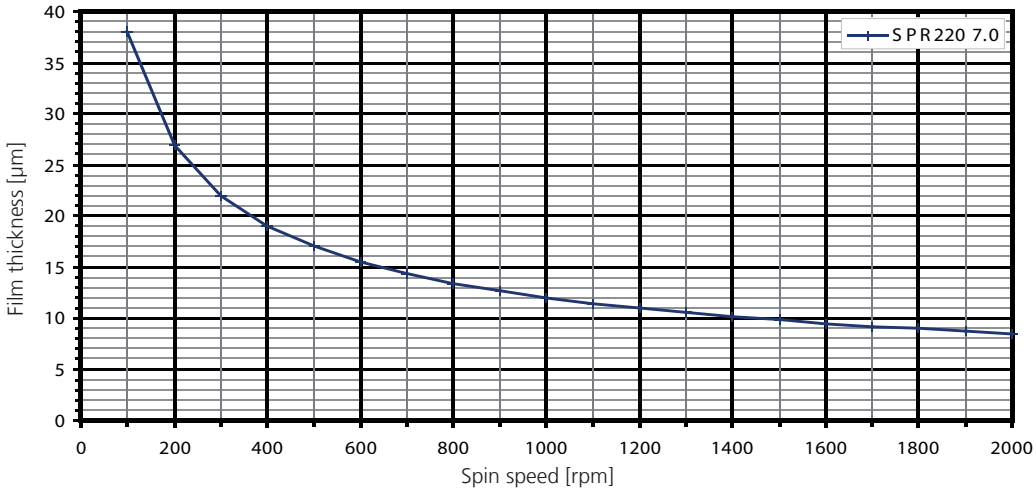
Etch trenches (Bosch Process)
4 to 10 µm features
(up to 100 µm deep)



Wet wafer etch (1:5 HF 5 min)
2 µm features

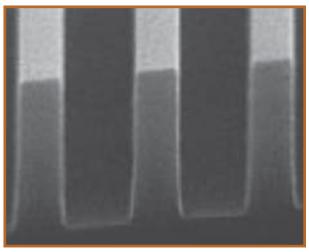


40 µm SPR220 over-plate with Au

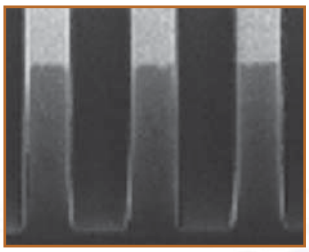


# Resist Series SPR700

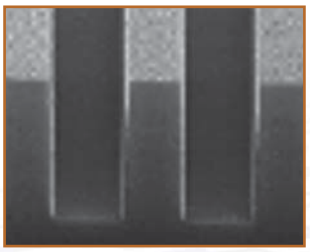
| Resist | SPR700-1.8M | SPR700-1.8 | SPR700-1.2 L | SPR700-1.2 | SPR700-1.0 |
|---|---|---|---|---|---|
| Film thickness @ 4000 rpm | 1.8 µm | 1.8 µm | 1.2 µm | 1.2 µm | 1.0 µm |
| Viscosity / cSt | 34.1 | 35.1 | 18.3 | 18.3 | 14.1 |
| Dose ( i-line) | 270 mJ | 190 mJ | 160 mJ | 140 mJ | 130 mJ |



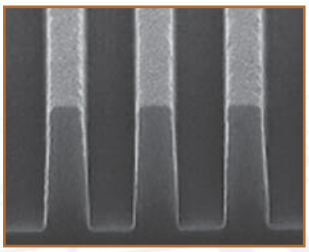
1.8 µm FT/ 0.6 µm L/S 270 mJ (1.8M)



2.2 µm FT/ 0.6 µm L/S 197 mJ



1.2 µm FT/ 0.5 µm L/S 134 mJ



0.968 µm FT/ 350 nm L/S 135 mJ

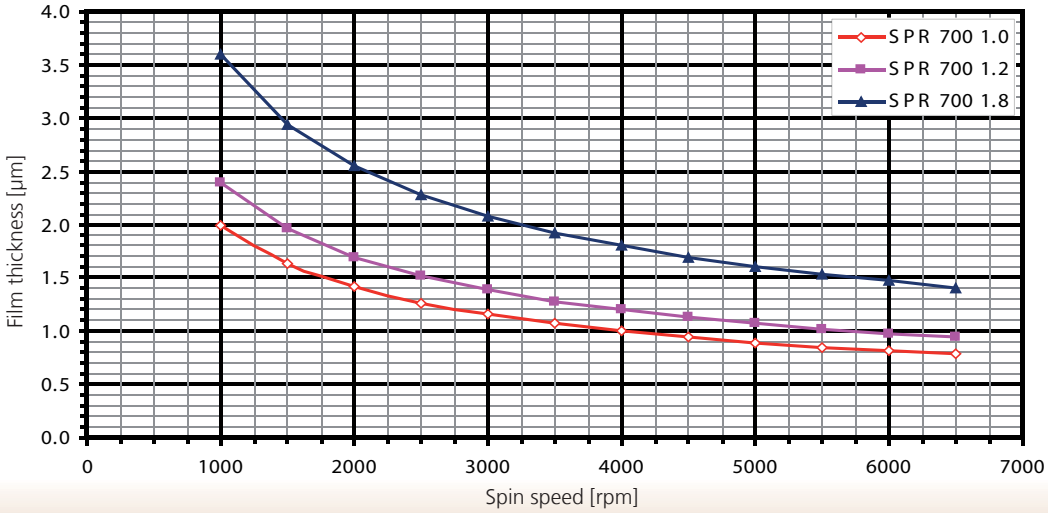
## SPR700

For Microlithography Applications

**MEGAPOSIT SPR700** series photoresists are positive multiwavelength photoresists that are optimized to provide robust process latitudes and high throughput with excellent thermal stability. SPR700 resists are compatible across a wide variety of developer families. This versatility makes SPR700 photoresists ideal for a number of applications, especially mix and match lithography.

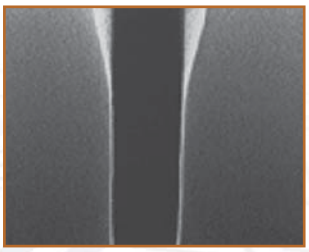
### Advantages

- Multiwavelength (i-line, g-line and broadband)
- Compatible across a wide variety of developer families (0.26N,0.24N, 0.21N)
- Excellent process latitudes and robust process
- Thermal stability greater than or equal to 135°C
- High throughput for stepper and developer process
- Excellent DOF

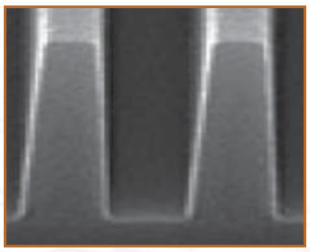


## Resist Series SPR955

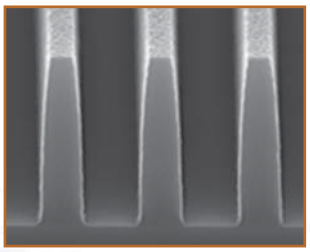
| Resist | SPR955-3.0 | SPR955-2.1 | SPR955-1.8 | SPR955-1.4 | SPR955-1.1 | SPR955-0.7 |
|---|---|---|---|---|---|---|
| Film thickness @ 3000 rpm | 3.0 µm | 2.1 µm | 1.8 µm | 1.4 µm | 1.1 µm | 0.7 µm |
| Viscosity / cSt | 63.6 | 34.3 | 28.6 | 19 | 14.3 | 8.5 |
| Dose ( i-line) | 415 mJ | 238 mJ | 210 mJ | 197 mJ | 173 mJ | 157 mJ |



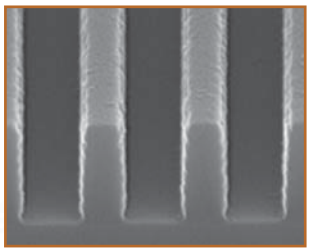
5.0 µm FT/ 0.8 µm L/S 800 mJ



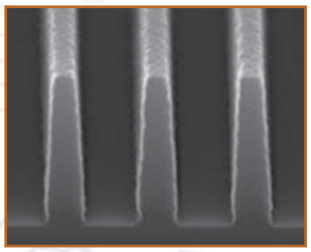
1.8 µm FT/ 450 nm L/S 205 mJ



1.5 µm FT/ 0.4 µm L/S 197 mJ



0.76 µm FT/ 350 nm L/S 160 mJ



1.08 µm FT/ 280 nm L/S 170 mJ

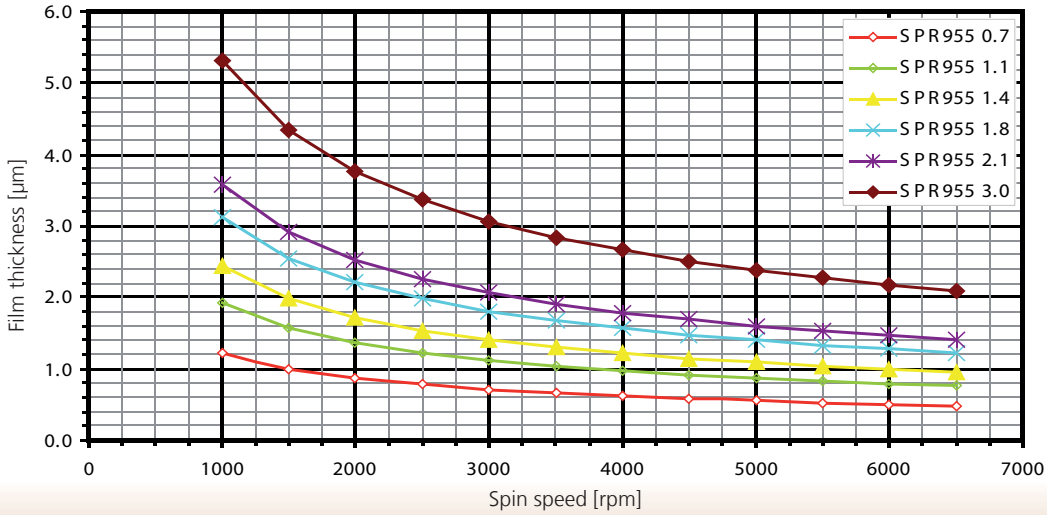
### SPR955
For Microlithography Applications

**MEGAPOSIT SPR955** series photoresist is a general purpose, high – throughput, i-line photoresist for **0.35 µm** front-end and back-end applications. SPR955 is optimized for anti-reflective (organic and inorganic) coating.

### Advantages

**350 nm Design Rules**

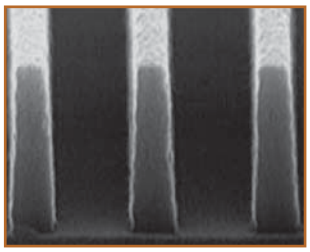
- Dense Lines/Spaces and isolated lines on polysilicon
- Dense Lines/Spaces in high-aspect ratio film on TiN
- Contact holes on oxide
- Isolated spaces (trenches)



# Resist Series Ultra-*i* ™123 – High Resolution < 0.25 µm

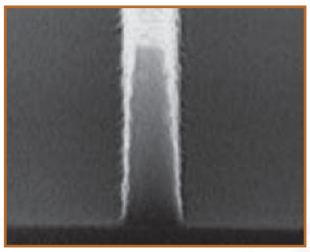
| Resist | Ultra-*i* ™123-1.0 | Ultra-*i* ™123-0.8 | **Ultra-*i* ™123-0.35** |
|---|---|---|---|
| Film thickness @ 2500 rpm | 1.0 µm | 0.8 µm | 0.35 µm |
| Viscosity / cSt | 8.6 | 6.6 | 4.09 |
| Dose ( i-line) | 295 mJ | 250 mJ | 150 mJ |

230 nm 1:1.5 L/S



225 mJ/ cm²

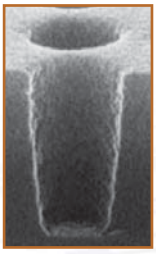
230 nm isolated lines



235 mJ/ cm²

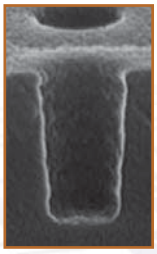
ARL: 1.500 Å XHRi over Si
FT: 7.620 Å
EXP: 0.60 NA, 0.75σ

300 nm 1.1 contact hole



535 mJ/ cm²
FT: 8.650 Å over BPSG
EXP: 0.57 NA, 0.85σ

250 nm wafer, 350 nm mask



345 mJ/ cm²
FT: 7.480 Å over BPSG
EXP: 0.57 NA, 0.85σ

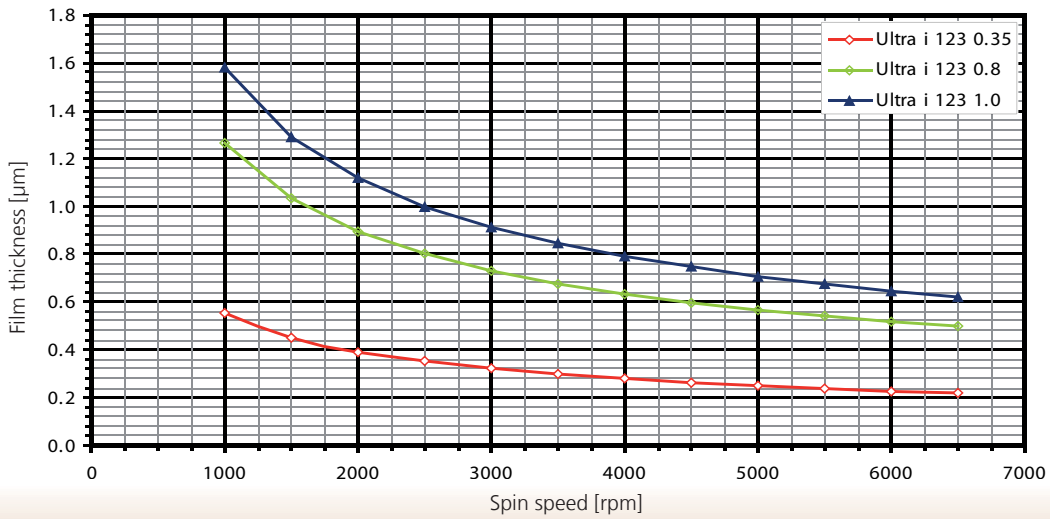
## Ultra-*i* ™123
For Microlithography Applications

**Ultra-*i* ™123** is an advanced, general purpose, 0.25 µm critical i-line photoresist with extendibility to 0.23 µm and below. Ultra-*i* ™123 is optimized for antireflective coating.

### Advantages

**Lines / Spaces**
- ≥ 1.0 µm DoF @ 0.25 µm dense
- ≥ 1.1 µm DoF @ 0.23 µm semi-dense

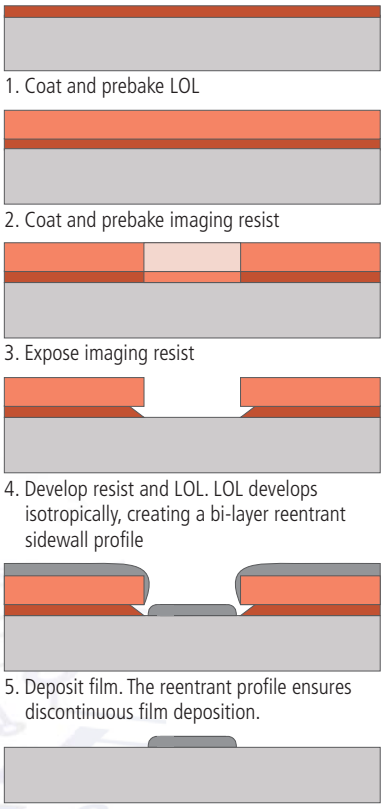
**Contact Holes**
- ≥ 1.1 µm DoF @ 0.30 µm CH
- ≥ 1.1 µm DoF @ 0.25 mm CH (with PSM)



## MICROPOSIT LOL 1000 and LOL 2000 – Lift off – LOL for Bi-Layer Processes

Microposit LOL 1000/2000 lift-off layer is an enhanced dissolution rate, dyed PMGI (polymethylglutarimide) solution used for lift-off processes requiring tight CD control, such as GMR thin film head, GaAs, and other leading-edge semiconductor applications. The LOL bilayer lift-off process is suitable for applications where a thin layer of metal is sputtered or evaporated in an additive process. CD variation due to etch bias inherent in substractive processes is eliminated, resulting in superior metal line width control. Attack on the substrates by an etchant is eliminated.

LOL 2000 on Si at 200 °C/ 5 min. with 5.0 micron SPR950



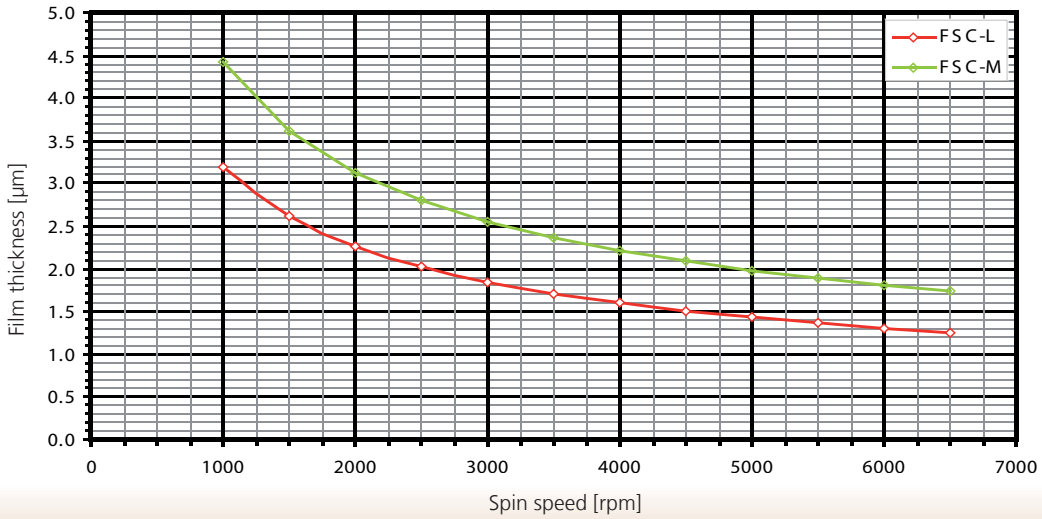
1. Coat and prebake LOL
2. Coat and prebake imaging resist
3. Expose imaging resist
4. Develop resist and LOL. LOL develops isotropically, creating a bi-layer reentrant sidewall profile
5. Deposit film. The reentrant profile ensures discontinuous film deposition.
6. Lift-off bi-layer resist stack, leaving only desired film.

## MICROPOSIT FSC – PROTECTIVE SURFACE COATING

**MICROPOSIT FSC** series surface coating is a non-imagable coating formulated as a protective coat for use during chemical or mechanical processes in microelectronic fabrication. The system has been formulated with a single solvent. It does not contain xylene, acetone, or Cellosolve acetate.

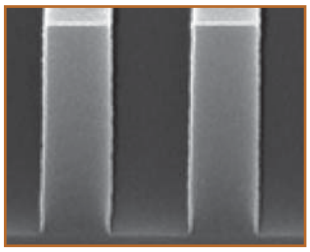
**Microposit FSC Series Surface Coating is available in two thickness ranges.**

- FSC-L: 1.3 to 1.8 µm
  For wet and dry etch protection 0.2 µm filtration
- FSC-M: 2.4 to 3.3 µm
  For front-side protection during back lapping 0.2 µm filtration

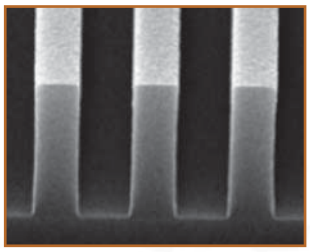


## Resist Series UV26

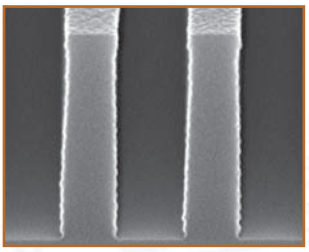
| Resist | UV26-3.0 | UV26-2.5 | UV26-2.0 | UV26-1.5 | UV26-1.1 | UV26-0.85 |
|---|---|---|---|---|---|---|
| Film thickness @ 3000 rpm | 3.0 µm | 2.5 µm | 2.0 µm | 1.5 µm | 1.1 µm | 0.85 µm |
| Viscosity / cSt | 112 | 80 | 58.4 | 37 | 23.75 | 18.5 |
| Dose (average for L/S) | 30 mJ | 27 mJ | 25 mJ | 20 mJ | 19 mJ | 15 mJ |



2.5 µm Ft / 800 nm L/S 25 mJ



1.8 µm Ft / 600 nm L/S 21 mJ



1.4 µm Ft / 380 nm L/S 19 mJ

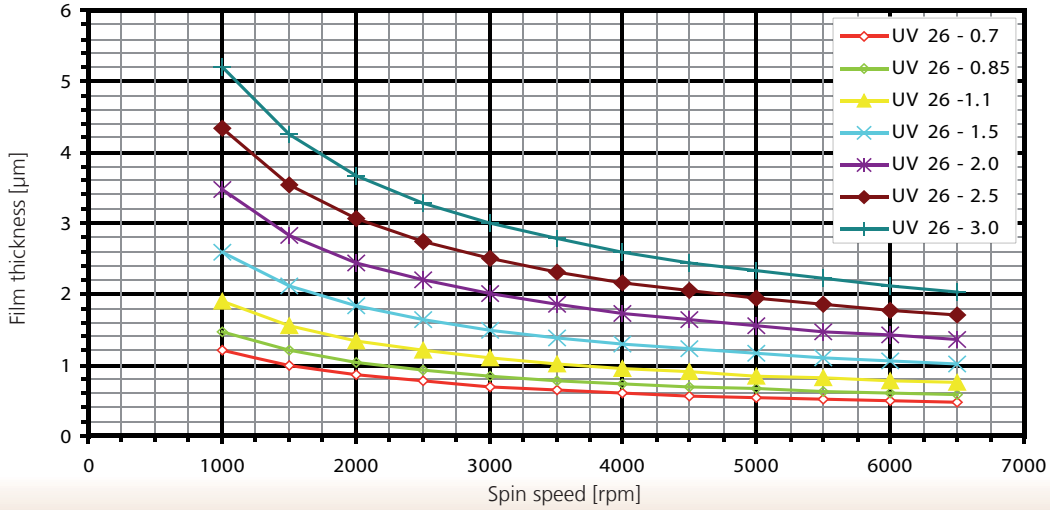
### UV26
Description

**UV26** is a positive DUV photoresist developed for deep Implant applications. The low viscosity of UV26 allows for reduced dispense volume and improved coating uniformity for film ranging from 0.7 µm to 3.0 µm.

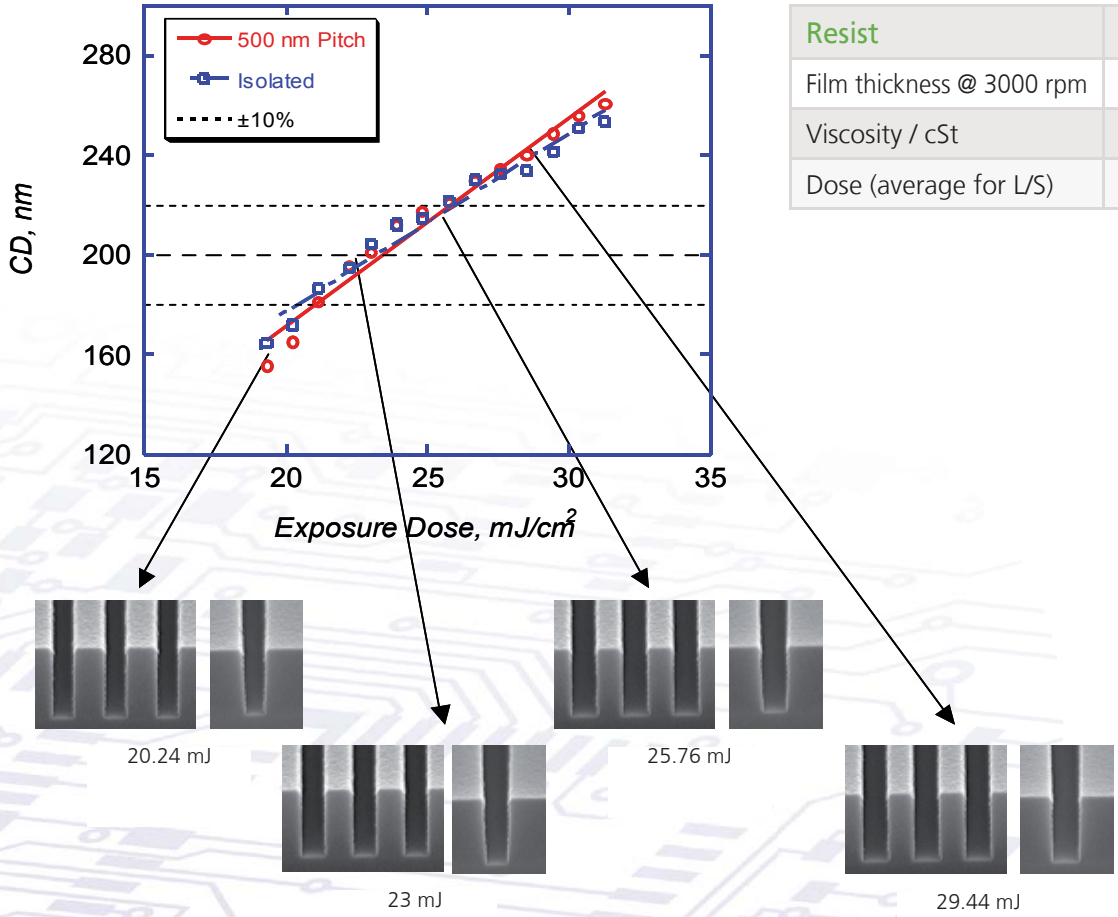
### Features

**Sizing Energy⇨DoF⇨Resolution**

- 16.5 mJ/cm² for 350 nm 1:1 Lines/Spaces at 1.1 µm FT⇨0.80 µm DoF⇨Resolution 240 nm
- 18.5 mJ/cm² for 450 nm 1:1 trenches at 1.8 µm FT⇨1.35 µm DoF⇨Resolution 280 nm
- 20.5 mJ/cm² for 600 nm 1:1 Lines/Spaces at 2.5 µm FT⇨1.0 µm DoF⇨Resolution 500 nm



# Resist Series UV60




| Resist | UV60-0.75 |
|---|---|
| Film thickness @ 3000 rpm | 750 nm |
| Viscosity / cSt | 12.7 |
| Dose (average for L/S) | 23 mJ |

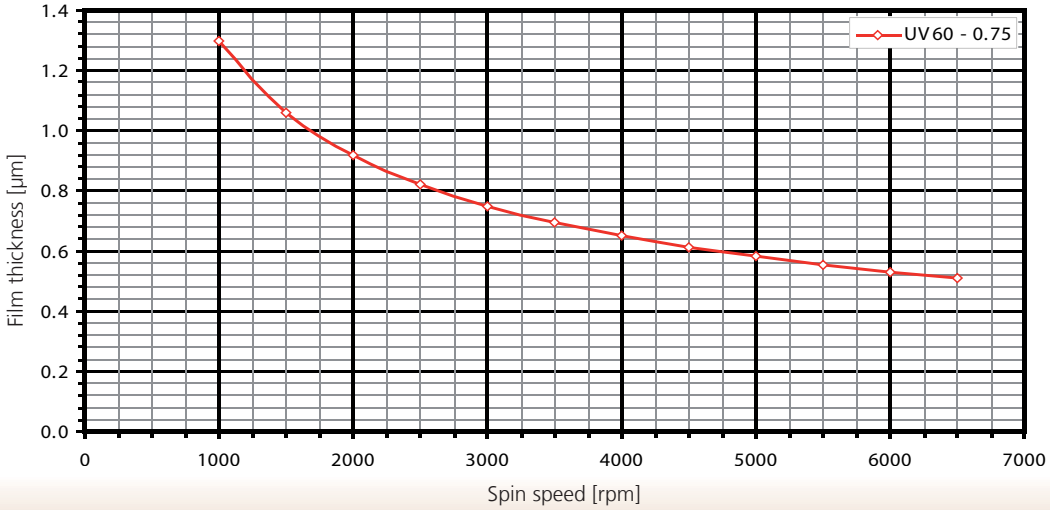
## UV60

For Microlithography Applications

**UV60** is a positive DUV photoresist designed for consolidation of implant, metal contact hole and via applications for 200 nm features. UV60 works well on reflective substrates.

### Advantages

- DoF > 0.5 µm for 200 nm 1:1.25 trenches
- Excellent resolution
- Good exposure latitude
- Vertical profiles

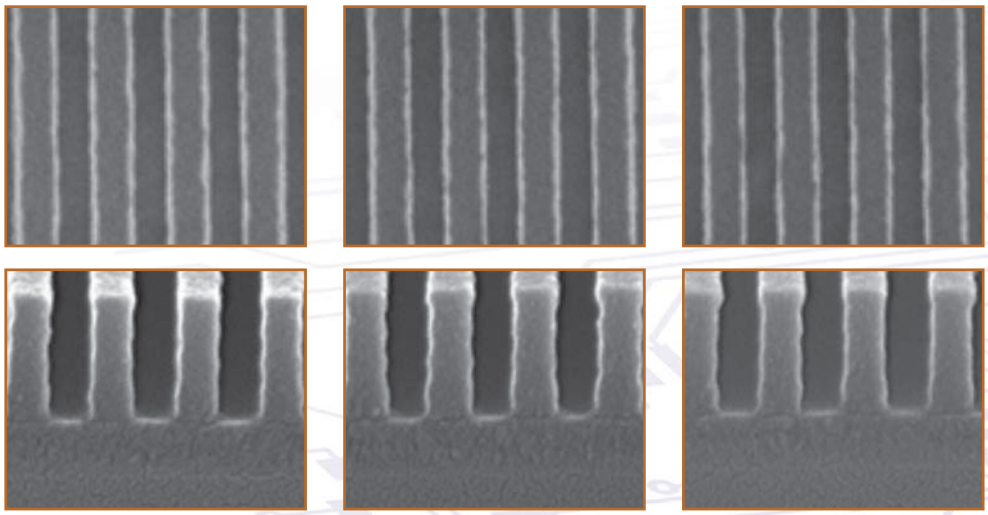


# Resist Series UV2000 – High Resolution < 130 nm

| Mask Space CD | 90 nm | 100 nm | 110 nm |
|---|---|---|---|
| Target Space CD | 90 nm | 90 nm | 90 nm |
| Bias | 0 nm | +10 nm | +20 nm |
| Es | 1074 J/m$^2$ | 800 J/m$^2$ | 624 J/m$^2$ |
| EL max | 9.9% | 9.9% | 9.0% |
| FL max | 0.63 um | 0.60 um | 0.65 um |
| FL @ 8% EL | 0.42 um | 0.50 um | 0.50 um |
| MEEF | NA | 4.2 | NA |

| Resist | UV2000-0.35 |
|---|---|
| Film thickness @ 3000 rpm | 350 nm |
| Viscosity / cSt | 4.8 |
| Dose (for 100nm 1:1 L/S) | 73.5 mJ |

| | Space/Line | Space/Line | Space/Line |
|---|---|---|---|
| Mask CD: | 90/130nm | 100/120nm | 110/110nm |
| Wafer CD: | 90/130nm | 90/130nm | 90/130nm |

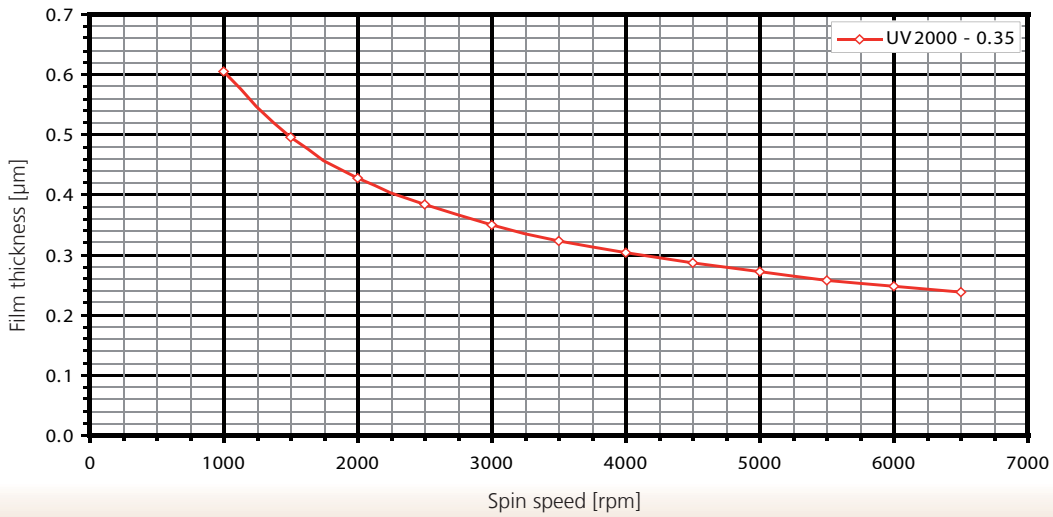


## UV2000
Description

**UV2000** is a high resolution < 130 nm, low temperature, positive DUV resist product for critical line/space applications in FEOL and BEOL (DRAM, Flash Memory and Logic). This product features good process window, profiles, resolution and low pattern collapse.

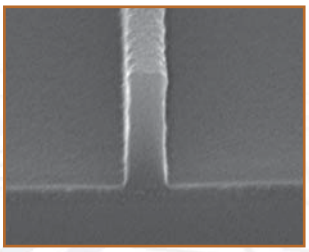
### Advantages

- Low pattern collapse
- Low defect density
- Good process windows
- DOF=0.5 µm for 100 nm 1:1 Lines/Spaces

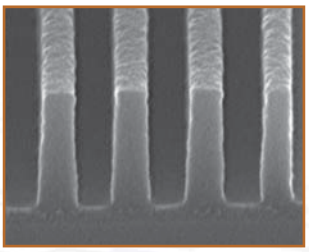


# Resist Series UV210

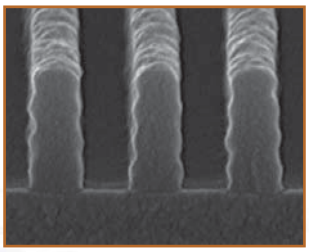
| Resist | UV210-0.6 | UV210-0.4 | UV210-0.3 |
|---|---|---|---|
| Film thickness @ 2750 rpm | 0.6 µm | 0.4 µm | 0.3 µm |
| Viscosity / cSt | 13.83 | 10.07 | 7.52 |
| Dose (average for L/S) | 30 mJ | 28 mJ | 26 mJ |



500 nm Ft/ 180 nm L/S



500 nm Ft/ 180 nm L/S



315 nm Ft/ 130 nm/ 220 nm L/S

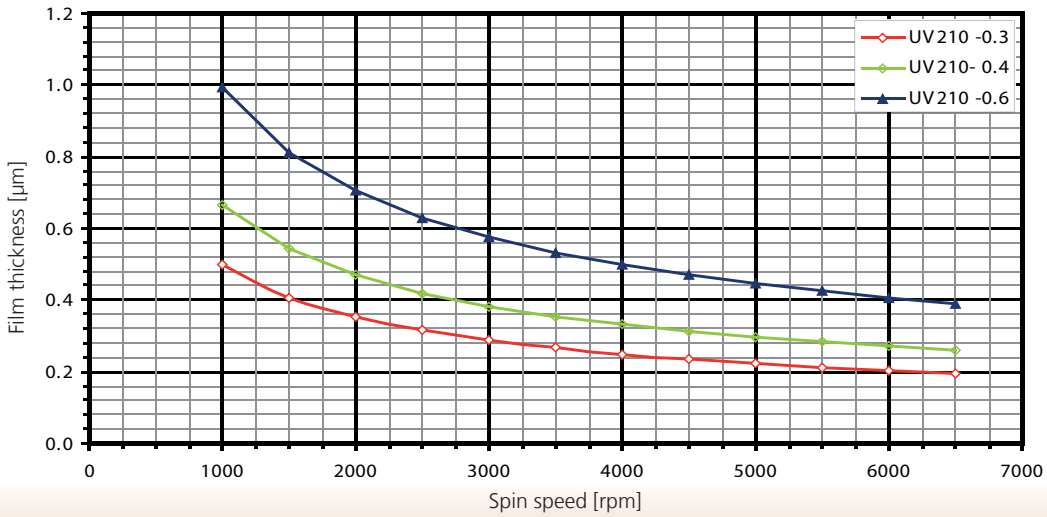
## UV210
For Microlithography Applications

**UV210** is a multipurpose resist that can be utilized for gate, phase shift mask contact holes and trench applications in 180 – 130 nm CD range.

### Features

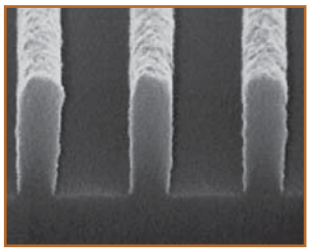
**Sizing Energy⇨DoF⇨Resolution**

- 28 mJ/cm² for 130 nm 1:1.5 lines / spaces
  ⇨1.0 µm DoF⇨Resolution 130 nm
- 33 mJ/cm² for 180 nm 1:1 trenches
  ⇨0.8 µm DoF⇨Resolution 160 nm
- 60 mJ/cm² for 180 nm 1:1 contact holes
  ⇨0.7 µm DoF⇨Resolution 150 nm (70 nm Bias)

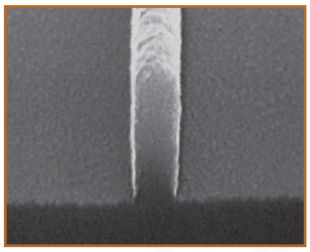


# Resist Series UVN30 – Negative Photoresist

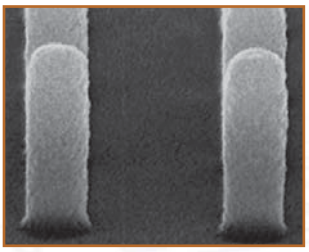
| Resist | UVN30-0.5 | UVN30-0.4 |
|---|---|---|
| Film thickness @ 3000 rpm | 0.5 µm | 0.4 µm |
| Viscosity / cSt | 4.69 | 3.81 |
| Dose (average for L/S) | 18.5 mJ | 15 mJ |



150 nm 1:2 L/S



150 nm isolated lines



250 nm 1:2 posts

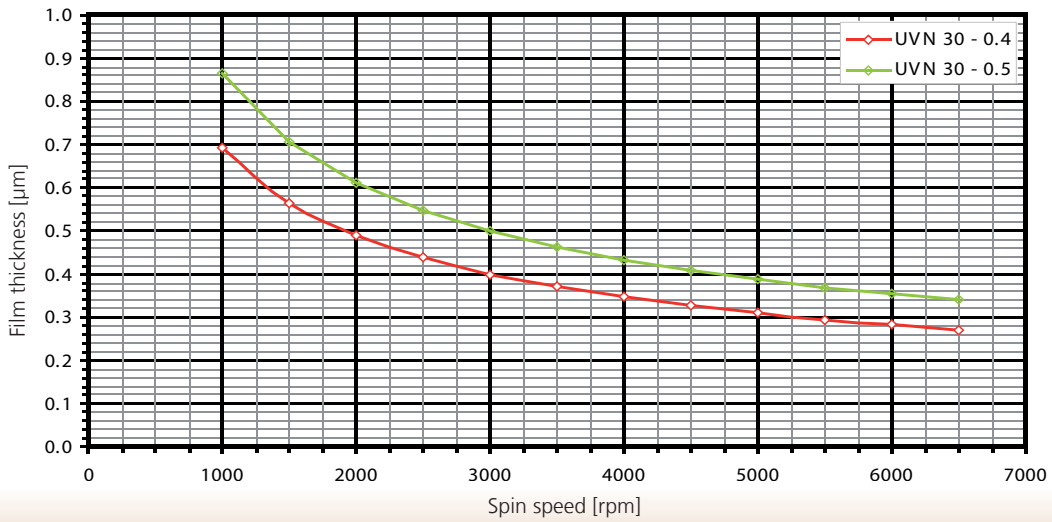
## UVN30
Description

**UVN30** is a negative photoresist for DUV, X-Ray, and e-beam applications. This resist is targeted for fast throughput device production rules down to 150 nm. Nested lines/spaces, isolated lines, posts, and contacts can be resolved with wide process windows. Minimal PEB sensitivity, insensitivity to airborne contaminants, and superior metal etch resistance are only some of the properties UVN30 offers.

### Features

**Sizing Energy**
- 10.0 – 300 mJ for Lines and Spaces

**Depth of Focus**
- 1.0 µm DoF for 350 nm 1:2 posts
- 0.8 µm DoF for 300 nm 1:2 posts
- 0.75 µm DoF for 250 nm 1:2 posts
- 0.80 µm DoF for 150 nm 1:2 Lines/Spaces
- 0.60 µm DoF for 150 nm isolated lines

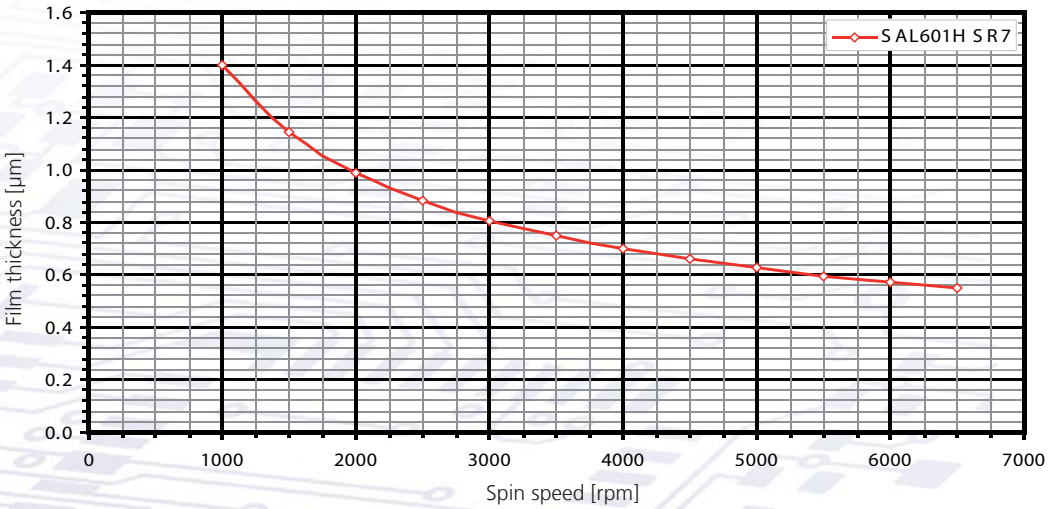


## SAL601H-SR7 – Negative E-Beam Resist

**MICROPOSIT SAL601 E-BEAM RESIST** has been designed to maximize the throughput and resolution capabilities of electron beam lithography. Its attributes of high sensitivity, greater process tolerance, and easy alignment result in efficient use of expensive equipment. Because this resist is novolac based and aqueous alkaline developable, it is non-swelling, and thus provides greater resolution and critical dimension control.

Companion developers include the metal ion free MICROPOSIT MF-322 Developer, or, for use on aluminium subtrates, MICROPOSIT Developer. Ideal use of the negative-tone SAL601 Resist is in direct-write applications.

**Expose:**
Approximately 4-12µC/cm² matrix @ 20 keV








## MICROPOSIT PRIMER

**MICROPOSIT** Primers are based upon hexamethyldisilizane (HMDS), a well-known chemical pretreatment for increasing photoresist adhesion to doped and undoped oxides, nitride, polysilicon, glass, quartz and other semiconductor surfaces.

### Advantages

- Process consistency
- High purity
- Compatible with all MICROPOSIT and MEGAPOSIT™ photoresists
- Suitable for in-line or batch processing
- Reduced undercutting at wet etch
- Increased yields

| Recommended Spin Priming Dilutions | | |
|---|---|---|
| Surface | Concentration | |
| | 20% | 50% |
| Phosphorous doped oxide | | x |
| undoped oxide | x | |
| Nitrides | x | |
| Silicon and polysilicon | x | |
| Metals | x | |

# ARC 248nm

| 248 nm Anti-Reflectants Product Selection Guide | | | | | |
|---|---|---|---|---|---|
| | Attributes | AR2/3 | AR10L | AR14 | AR14H |
| Minimum Reflectivity | Minimum (1st or 2nd) | 1st | 1st | 1st | 1st |
| | Thickness (nm) | 60 | 60 | 60 | 60 |
| ETCH | Bulk Etch Rate (Relative to UV6 Resist) | 1.3 | 1.3 | 1.3 | 1.3 |
| | Relative Etch Time (Relative to AR2/3) | 1.0 | 1.0 | 1.0 | 1.0 |
| Coating | Conformal | ● | ● | | |
| | Planar & Via fill | | | ● | ● |
| Resist Compatibility | ESCAP Resists | ● | ● | ● | ● |
| | Acetal/ Hybrid | | ● | ◐ | |
| | | PFOS | ● | ◐ | |
| | | | compatible | some compatible | |

# Developers

### Metal Ion Free (MIF)

(recommended where it is desirable to avoid a potential source of metal ion contamination)
**MF-20A Series –** MF-21A (0.21N), MF-24A (0.24N), MF-26A (0.26N), MF-28A (0.28N)
**MF-300 Series –** MF-319 (0.237N), MF-321 (0.21N), MF-322 (0.268N)
**MF-CD-26 Developer –** (0.26N, surfactant-free)

### Metal Ion Bearing (MIB)

**Microposit 351 Developer (1.39N) –** concentrate
**Microposit 303A Developer (1.7N) –** concentrate
**Microposit Developer (0.6N) –** concentrate, lowest attack on Aluminum
**Photoposit 160 Developer (0.6N) –** concentrate

| | | SP25 G2 | S1800 G2 | SPR350 SPR3000 | SPR220 | SPR700 | SPR660 SPR680 SPR955CM | ULTRA-i 123 | UV26 UV60 UV210 UV2000 | UVN30 | SAL601H |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MIF | MF-20A | | | | | | | | | | |
| | MF-300 | | | | | | | | | | |
| | MF-CD-26 | | | | | | | | | | |
| MIB | 351 Dev | | | | | | | | | | |
| | 303A Dev | | | | | | | | | | |
| | Micro Dev | | | | | | | | | | |
| | Photop. 160 | | | | | | | | | | |

recommended | possible | not recommended

www.microresist.com

## Advanced Removers

| | | |
|---|---|---|
| **Edge Bead Removers EBR**<br>EC Solvent, EC Solvent 11 | **Resist Remover Specialty Applications**<br>SRX-400 | **General Purpose Resist Remover**<br>SVC-14, 1165, 1112A, PRX-127 |
| **Resist and Polymer Remover - Batch Processing**<br>SVC-175 | **Polymer Remover Aluminum - Batch Processing**<br>PRX-417, ARS-425 | **Polymer Remover Aluminum - Single Wafer Processing**<br>PRX-505 |



## CHROME ETCHANT 18

**Chrome Etchant 18** is designed for use in micro-lithographic applications where high reproducibility and tight dimensional control is required. The ready-to-use solution, which is based on acidic ceric salts, is stable and compatible with positive and negative resist systems.

The principle application is mask manufacture in microelectronic industry for etching bright and anti-reflective chrome thin-films on mask blanks. Other applications are in thin-film technology, (thin film circuitry, optical gratings, microelectronic devices, etc) for etching chromium, chrome-nickel alloys, molybdenum and tungsten films.

**PHYSICAL & CHEMICAL PROPERTIES:**

| | |
|---|---|
| Specific Gravity at 20/ 20°C | : Approx. 1.140 |
| Colour | : Orange |
| Turbidity | : Clear |
| Ceric Content | : Approx. 40 g/l |
| Total Acid Normality | : Approx. 1.90 N |

## Imprint

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Dipl. Chem. Gabi Grützner

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Jurisdiction:
Amtsgericht Berlin
Handelsregister 96 HBR 47424

technical realization and design:

*micro resist technology* GmbH
Liane Strauch
l.strauch@microresist.de

*micro resist technology* develops and produces photoresists and materials for advanced lithography and nano-imprint lithography as well as hybrid polymers for microoptical applications.
The products of micro resist technology are mainly used in MEMS applications, in the semiconductor industry, in optoelectronics, in new data storage media, and in nano-technology. Over 50 % of the turnover is achieved through exports. A world-wide network of distributors supports this.

Additionally to the own products micro resist technology has distribution contracts with Rohm & Haas Electronic Materials Europe Ltd. (GB), MicroChem Corp. (USA), and DuPont (USA).
*micro resist technology*'s customer services range from lithographic patterning of customers' substrates to the on-site introduction into production.

One of the essential criteria for success is the technological advice for the product applications by the company's scientists. micro resist technology puts a high priority on the consistent implementation of quality management methods. It has had a quality management system certified to DIN EN ISO 9001 since 1997.

*micro resist technology*'s products are:

- Polymers for Nanoimprint Lithography
- ORMOCER®s for micro-optical applications
- Photoresists for Deep-UV and Electron-beam Lithography
- Photoresists and Photopolymers for UV, Laser and X-ray Lithography
- Customer Services

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