

# Distribution DOW Products

*micro resist  
technology*

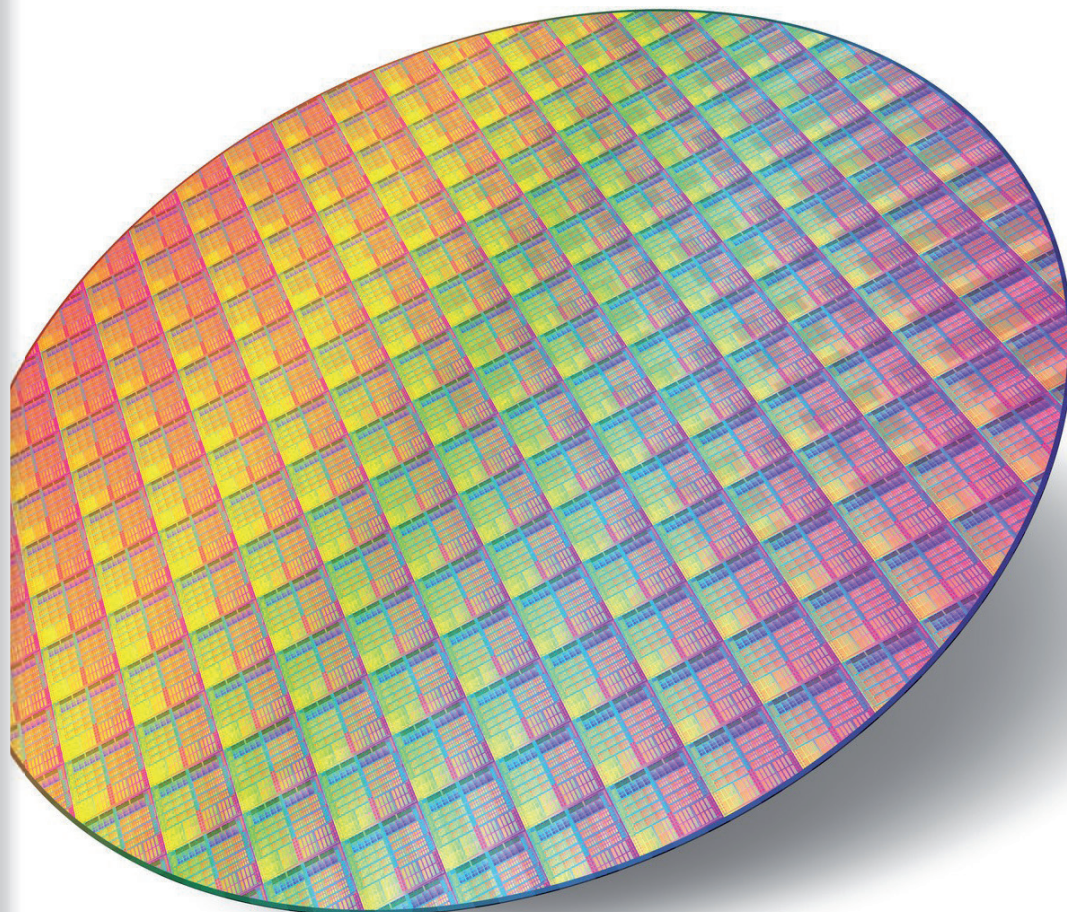
Gesellschaft für chemische Materialien spezieller Photoresistsysteme mbH

official distributor



Electronic Materials

- ⇒ **g-line • i-line • DUV - Resists**
- ⇒ **BARC Materials**
- ⇒ **Lift-off Resist**



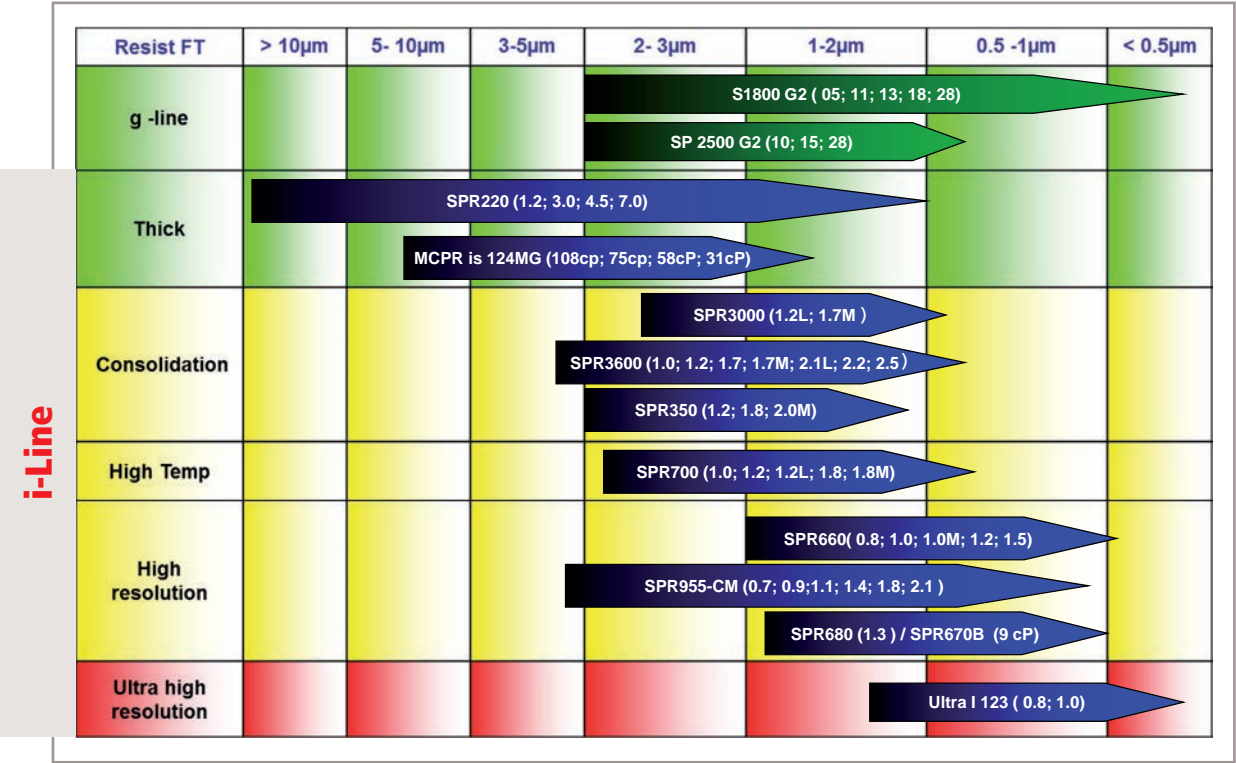
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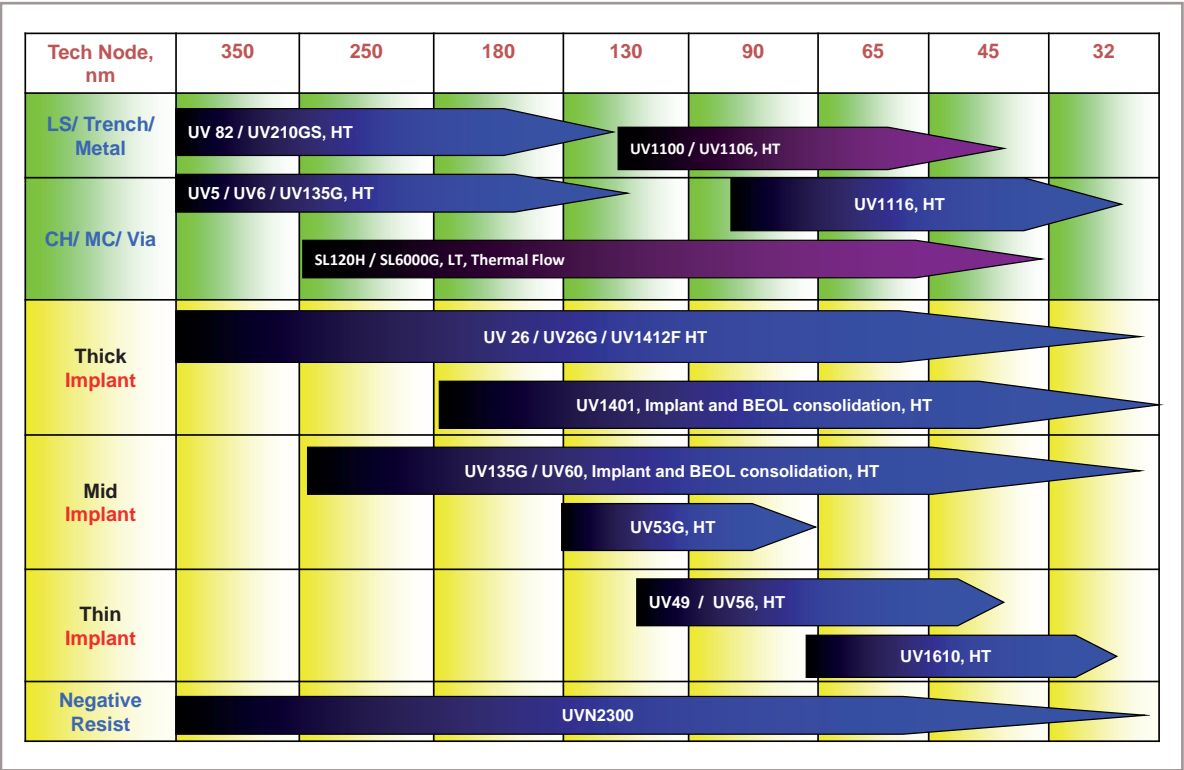
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RHEM • g-Line and i-Line Products – Overview vs. Film Thickness

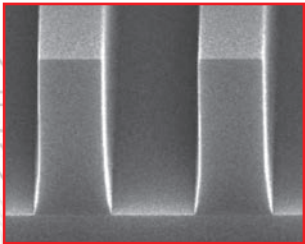


RHEM • DUV Products – Overview vs. Technical Node

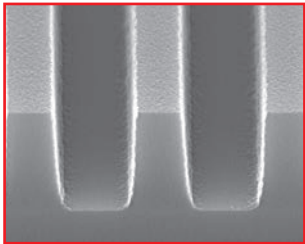




Resist	S1828 G2	S1818 G2 (SP16)	S1813 G2 (SP15)	S1811 G2	S1805 G2
Film thickness @ 4000 rpm	2.8 $\mu\text{m}$	1.8 $\mu\text{m}$	1.3 $\mu\text{m}$	1.1 $\mu\text{m}$	0.5 $\mu\text{m}$
Viscosity / cSt	88.5	39.4	25	15	5.3
Dose (Broadband)	300 mJ	200 mJ	160 mJ	140 mJ	100 mJ

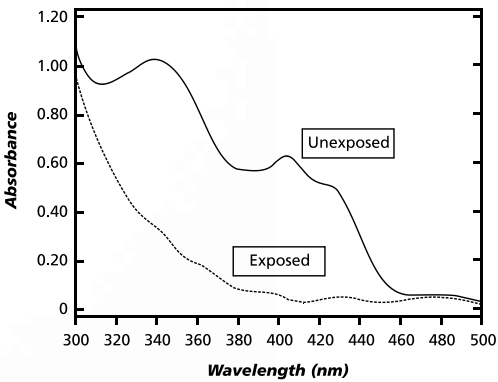


4  $\mu\text{m}$  Ft/ 2  $\mu\text{m}$  L/S 310 mJ



1.3  $\mu\text{m}$  Ft/ 0.8  $\mu\text{m}$  L/S 180 mJ

Absorbance Curve S1800G2

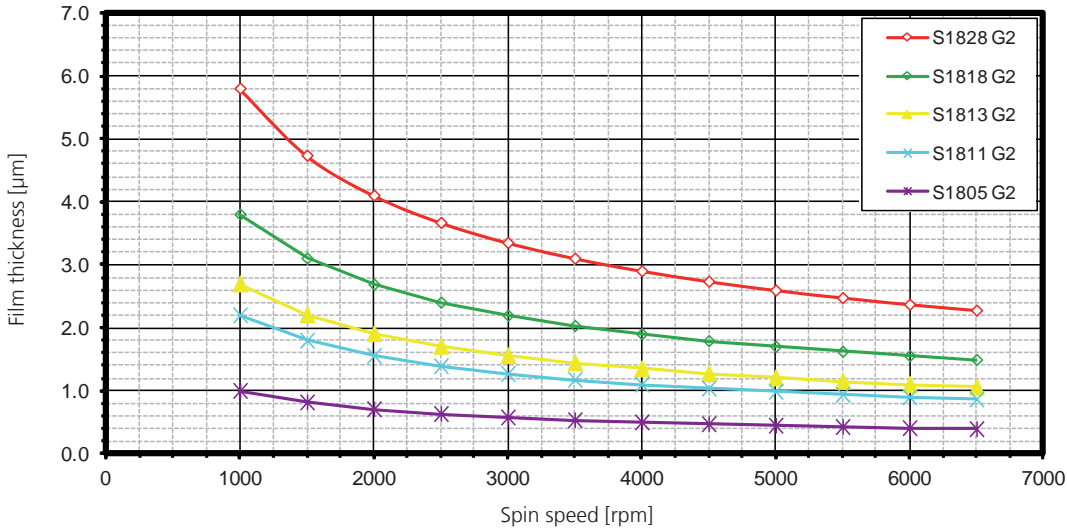


**S1800G2**  
For Microlithography Applications

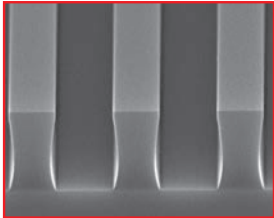
**MICROPOSIT S1800 G2** series photoresist are positive photoresist systems engineered to satisfy the microelectronics industry's requirements for IC device fabrication. The system has been engineered using a toxicologically – safer alternative casting solvent to the ethylene glycol derived ether acetates.

Advantages

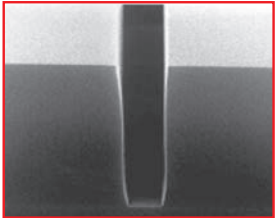
- Optimized for **g-line & i-line exposure**
- Effective for broadband exposure
- Excellent adhesion ( Improved with SP )
- PFOS / PFOA – free
- Optimized for use with MF-319 metal-ion-free developer family
- Compatible with metal-ion-bearing developers



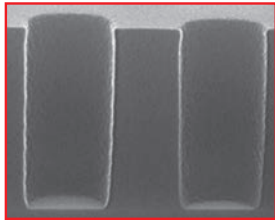
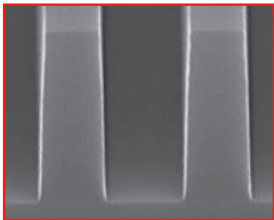
Resist	SPR220-7.0	SPR220-4.5	SPR220-3.0	SPR220-1.2
Film thickness @ 3000 rpm	7.0 $\mu\text{m}$	4.5 $\mu\text{m}$	3.0 $\mu\text{m}$	1.2 $\mu\text{m}$
Viscosity / cSt	390	123	49	11.5
Dose ( i-line)	470 mJ	380 mJ	310 mJ	160 mJ



8  $\mu\text{m}$  Ft/ 5  $\mu\text{m}$  L/S 310 mJ

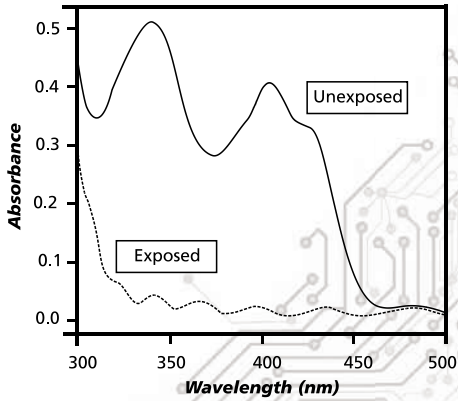


4.3  $\mu\text{m}$  Ft/ 0.8  $\mu\text{m}$  L/S 440 mJ



3.0  $\mu\text{m}$  Ft/ 1.0  $\mu\text{m}$  L/S 220 mJ

Absorbance Curve SPR220

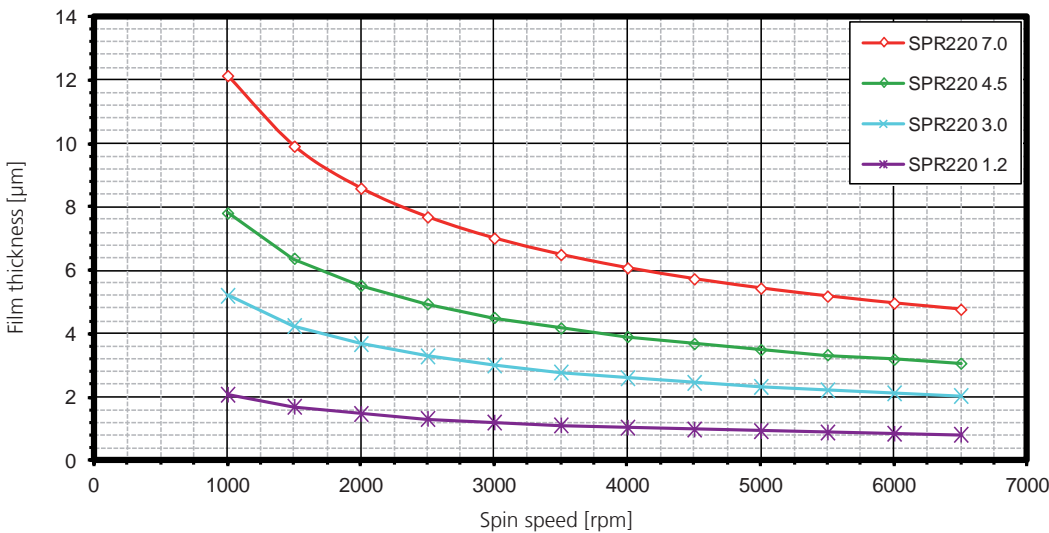


**SPR220**  
For Microlithography Applications

**MEGAPOSIT SPR220** i-line photo-resist is an optimized general-purpose, multi-wavelength resist designed to cover a wide range of film thicknesses, 1-30  $\mu\text{m}$ , 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
- >10 $\mu\text{m}$  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

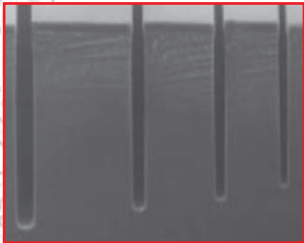


Recommended Process Conditions		
	1.1 μm to 4.0 μm Thickness*	1.1 μm to 10.0 μm Thickness*
Thickness:	1.1 μm – 4.0 μm	1.1 μm – 10.0 μm
Softbake:	115°C/ 90 sec. Contact hotplate	30 sec. step down to 115°C/ 90 sec. Contact hotplate**
Expose:	ASML PAS 5500/ 200 i-Line (0.48 NA, 0.50 σ)	ASML PAS 5500/ 200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

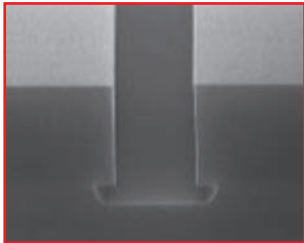
\* Recommended for isolated spaces as well

\*\*

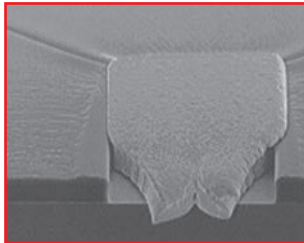
Refer to datasheet for further details



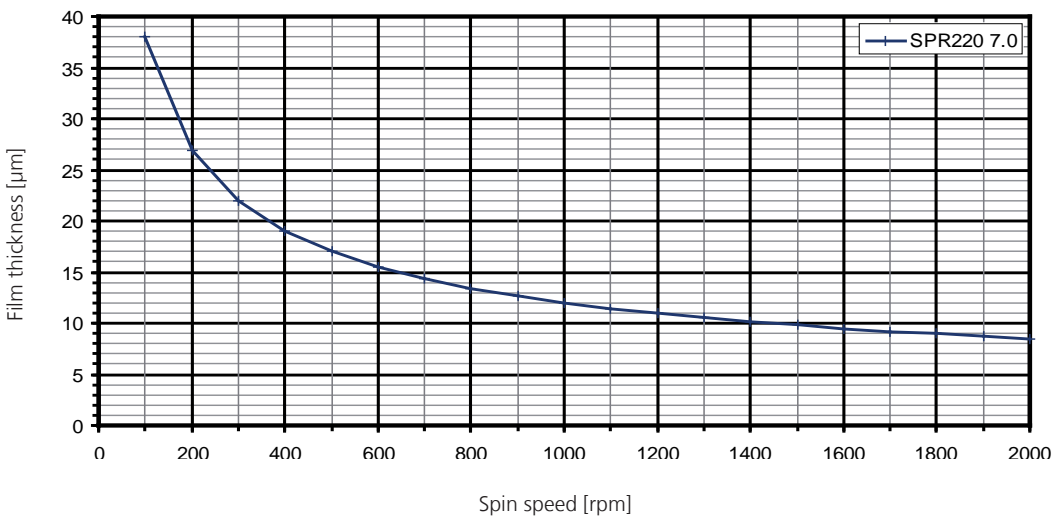
Etch trenches (Bosch Process)  
4 to 10 μm features  
(up to 100 μm deep)



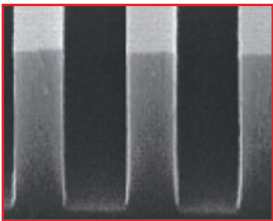
Wet wafer etch (1:5 HF 5 min)  
2 μm features



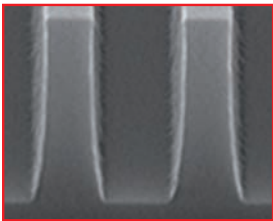
40 μm SPR220 over-plate with Au



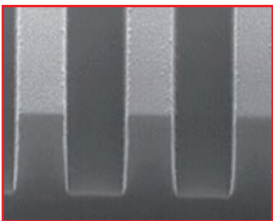
Resist	SPR3625	SPR3621 (L)	SPR3617 (M)	SPR3612	SPR3012 (L)	SPR3510
Film thickness @ 3000 rpm	2.5 $\mu\text{m}$	2.2 $\mu\text{m}$	1.7 $\mu\text{m}$	1.2 $\mu\text{m}$	1.18 $\mu\text{m}$	0.94 $\mu\text{m}$
Viscosity / cSt	59.7	45.3	31.5	18.3	24.3	14
Dose ( i-line)	140 mJ	110 mJ	150 mJ (M) 90 mJ	80 mJ	200 mJ	110 mJ



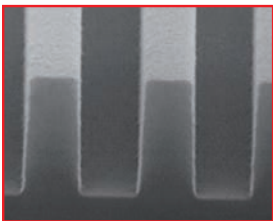
1.07  $\mu\text{m}$  FT / 600  $\mu\text{m}$  L/S  
85 mJ SPR3612



1.75  $\mu\text{m}$  FT / 600 nm L/S  
155 mJ SPR3617M

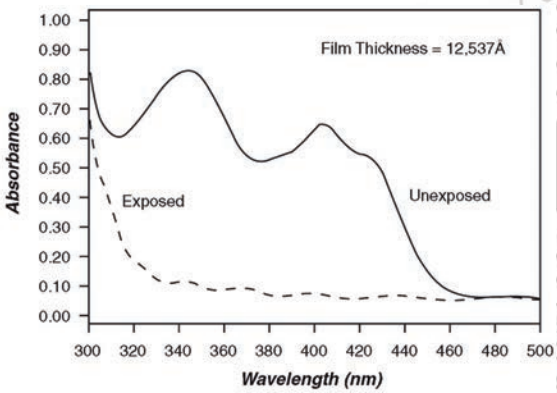


1.17  $\mu\text{m}$  FT / 700 nm L/S  
204 mJ SPR3012



1.07  $\mu\text{m}$  FT / 500 nm L/S  
105 mJ SPR3510

Absorbance Curve SPR3012



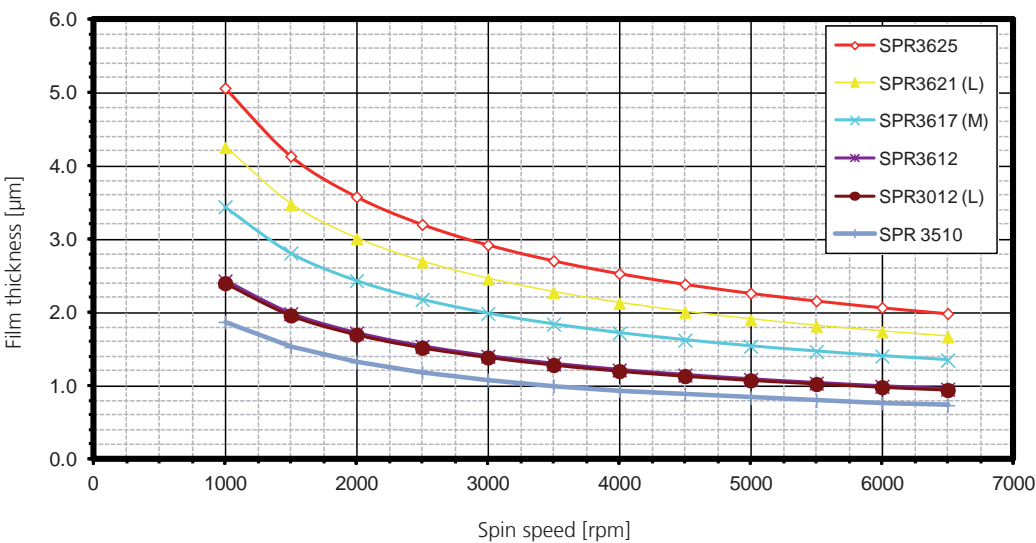
**SPR 3012 / 3510 / 3600**  
For Microlithography Applications

**MEGAPOSIT SPR3012/ 3510/3600**

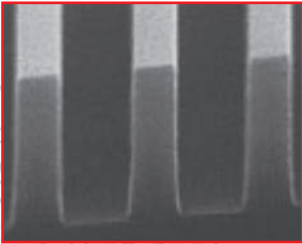
Series Photoresist are positive photoresist engineered for *i-line*, *g-line* and *broadband* application while providing high- throughput and excellent lithographic performance.

**Advantages**

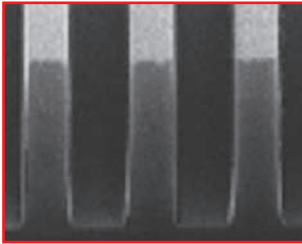
- MEGAPOSIT SPR 3012 :**
  - excellent adhesion
  - L-dyed version for improved CD control over topography
- MEGAPOSIT SPR 3510 :**
  - high thermal / etch resistance
  - high throughput process
- MEGAPOSIT SPR 3600 :**
  - extremely high throughput process
  - high thermal / etch resistance
  - dyed version for improved CD control over topography



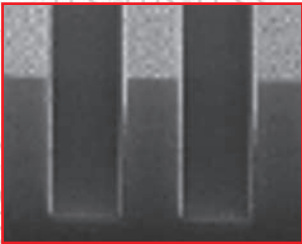
Resist	SPR700-1.8M	SPR700-1.8	SPR700-1.2L	SPR700-1.2	SPR700-1.0
Film thickness @ 4000 rpm	1.8 µm	1.8 µm	1.2 µm	1.2 µm	1.0 µm
Viscosity / cSt	35.1	35.1	18.3	18.3	14.1
Dose ( i-line)	270 mJ	190 mJ	160 mJ	140 mJ	130 mJ



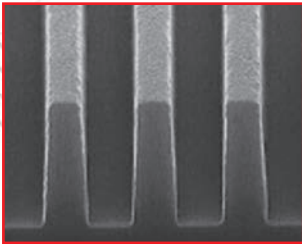
1.8 µm FT/ 0.6 µm L/S 270 mJ (1.8M)



2.2 µm FT/ 0.6 µm L/S 197 mJ

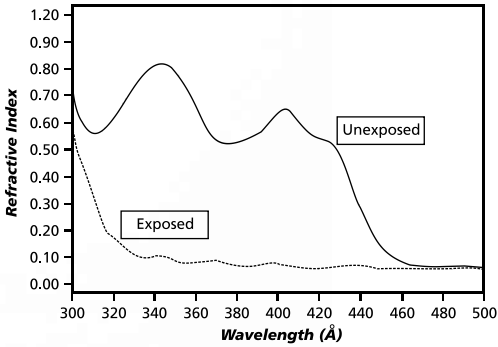


1.2 µm FT/ 0.5 µm L/S 134 mJ



0.968 µm FT/ 350 nm L/S 135 mJ

Absorbance Curve SPR700

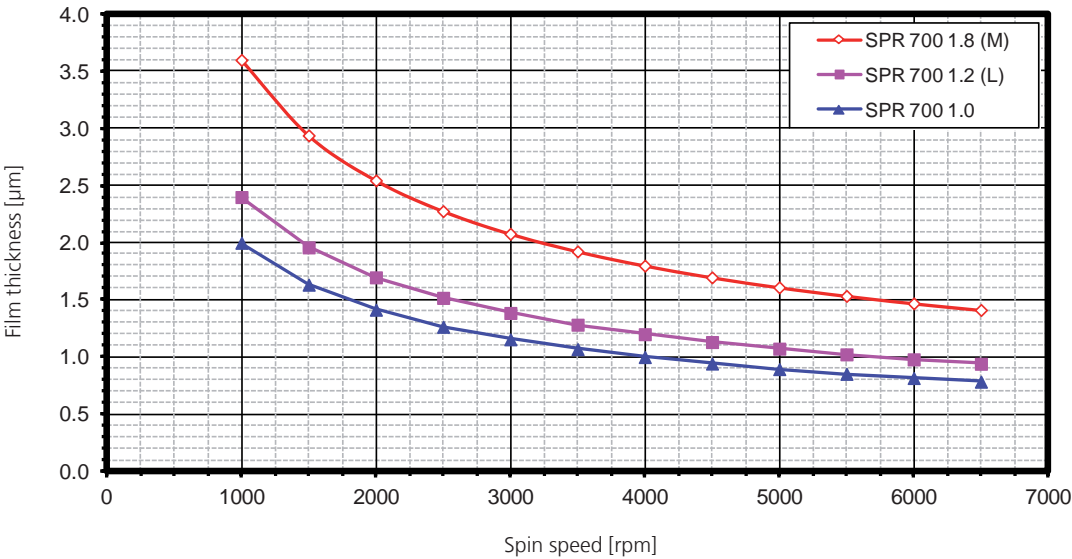


**SPR700**  
For Microlithography Applications

**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.

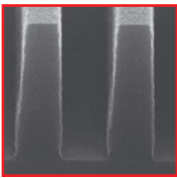
**Advantages**

- 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

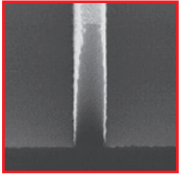




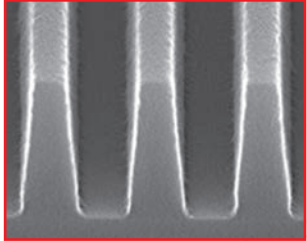
Resist	SPR660-1.5	SPR660-1.2	SPR660-1.0	SPR660-1.0M	SPR660-0.8
Film thickness @ 3200 rpm	1.5 $\mu\text{m}$	1.2 $\mu\text{m}$	1.0 $\mu\text{m}$	1.0 $\mu\text{m}$	0.8 $\mu\text{m}$
Viscosity / cSt	17.6	13.06	10.4	10.4	8
Dose ( i-line)	250 mJ	210 mJ	170 mJ	205 mJ	150 mJ



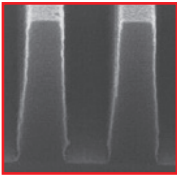
340



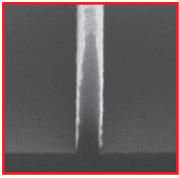
250



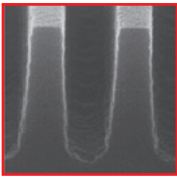
SPR660 1.0M, 0.977  $\mu\text{m}$  FT/  
0.35 $\mu\text{m}$  L/S, 202 mJ



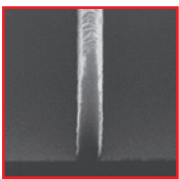
320



220



300

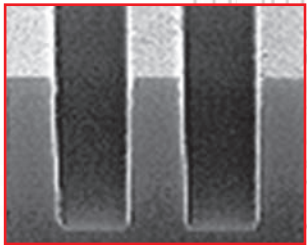


210

187 mJ/cm<sup>2</sup>

SPR660 – 1.0 (1.08  $\mu\text{m}$  FT)

200 mJ/cm<sup>2</sup>



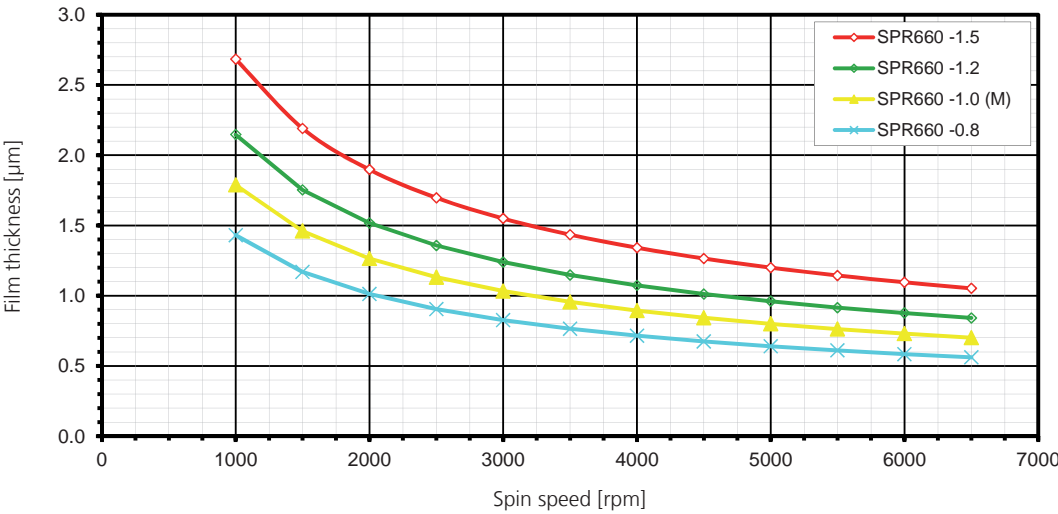
0.97  $\mu\text{m}$  FT/ 350 nm L/S, 163 mJ

**SPR660**  
For Microlithography Applications

**SPR660** series is an **advanced i-line photo-resist** designed for processing 0.350 micron features and larger. SPR660 performs in both line / space and contact hole application and on variety of substrates, including silicon dioxide, titanium nitride, and organic anti-reflectant coatings. The SPR660 product family includes a range of undyed dilutions as well dye loadings for improved processing over reflective surface.

**Advantages**

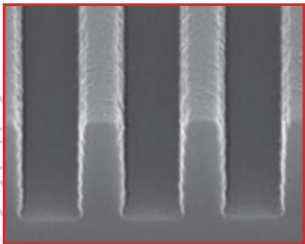
- Linear resolution
  - 0.325  $\mu\text{m}$  over silicon substrate
  - < 0.300  $\mu\text{m}$  over anti-reflectant
- Wide process latitudes
  - DoF 1.5  $\mu\text{m}$  for 0.4  $\mu\text{m}$  lines / Spaces
  - DoF 1.2  $\mu\text{m}$  for 0.4  $\mu\text{m}$  contact holes
- Compatible with 0.24N and 0.26N developer
- 12 month shelf life



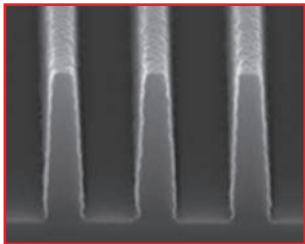
# Resist Series SPR955-CM

## Selection of i-Line Resists

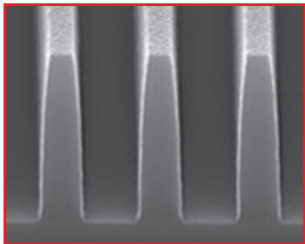
Resist	SPR955-CM-2.1	SPR955-CM-1.8	SPR955-CM-1.4	SPR955-CM-1.1	SPR955-CM-0.9	SPR955-CM-0.7
Film thickness @ 3000 rpm	2.1 μm	1.8 μm	1.4 μm	1.1 μm	0.9 μm	0.7 μm
Viscosity / cSt	34.3	28.6	19	14.3	11.2 μm	8.5
Dose ( i-line)	238 mJ	210 mJ	197 mJ	173 mJ	165 mJ	157 mJ



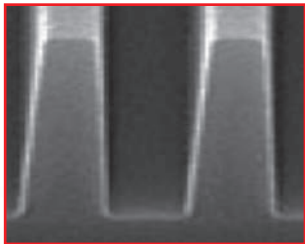
0.76 μm FT/ 350 nm L/S 160 mJ



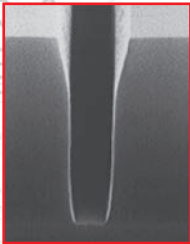
1.08 μm FT/ 280 nm L/S 170 mJ



1.5 μm FT/ 0.4 μm L/S 197 mJ



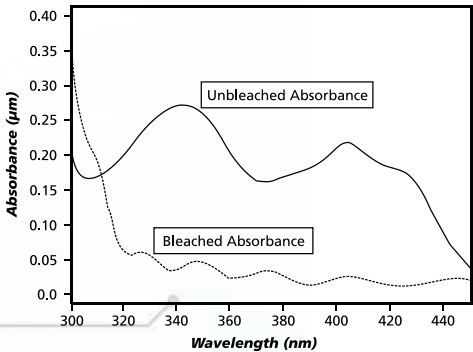
1.8 μm FT/ 450 nm L/S 205 mJ



5.0 μm FT/ 0.8 μm L/S 800 mJ

**SPR955-CM**  
For Microlithography Applications

Absorbance Curve SPR955-CM

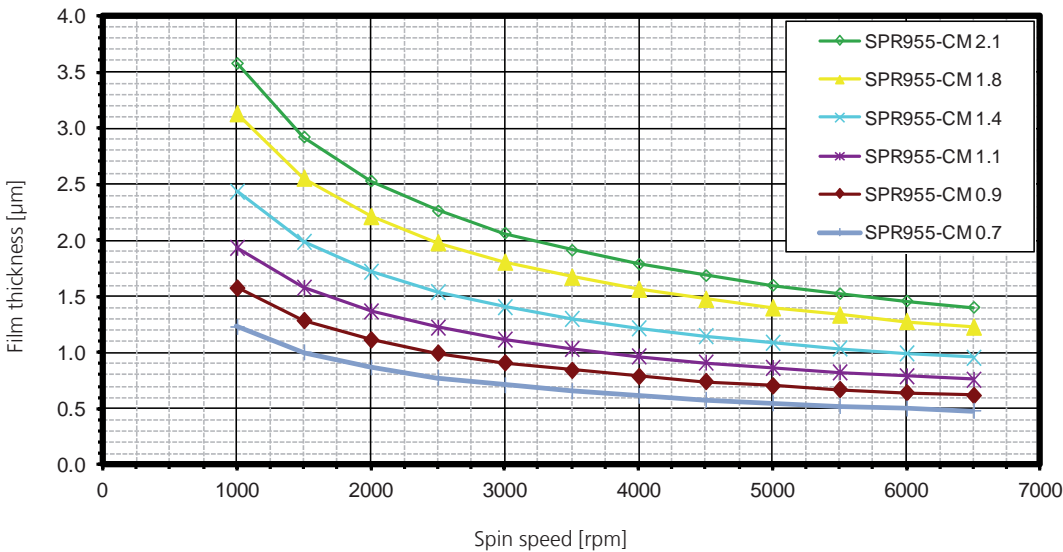


**MEGAPOSIT SPR955-CM** series photo-resist is a general purpose, high – throughput, **i-line photoresist for 0.35 μm front-end and back-end applications.** SPR955-CM is optimized for anti-reflective (organic and inorganic) coating.

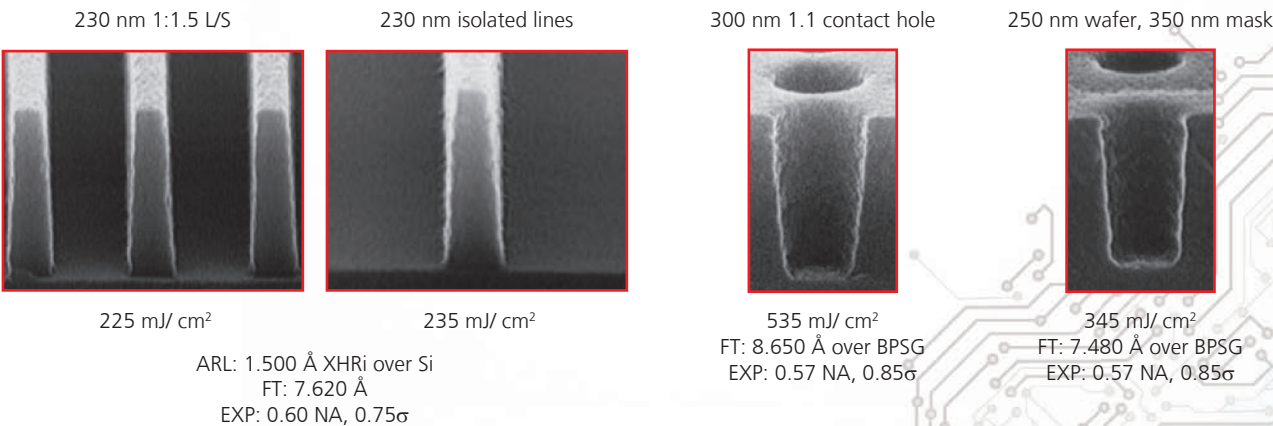
### Advantages

#### 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	Ultra-i™123-1.0	Ultra-i™123-0.8
Film thickness @ 2500 rpm	1.0 µm	0.8 µm
Viscosity / cSt	8.6	6.6
Dose ( i-line)	295 mJ	250 mJ

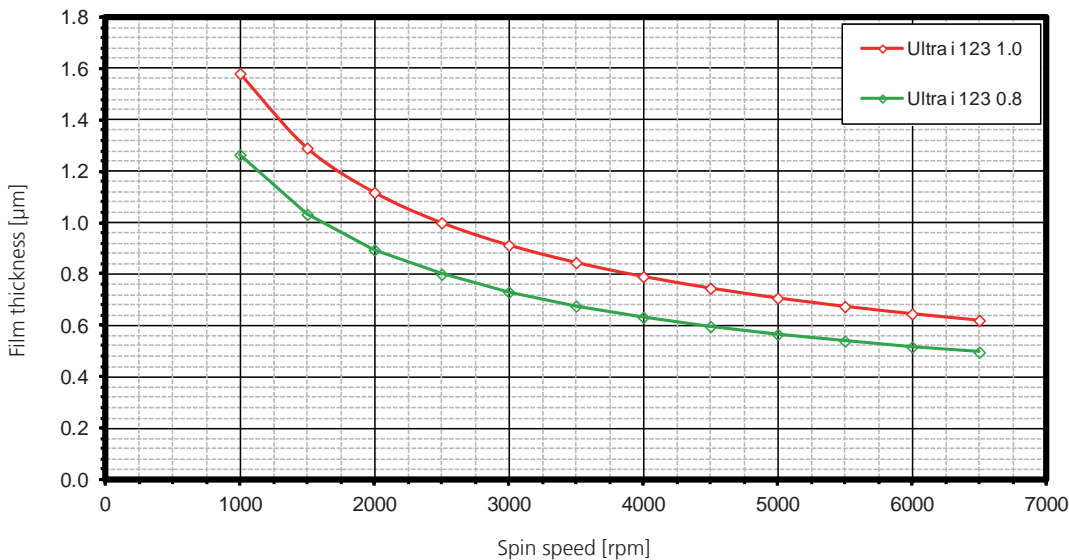


**Ultra-i™123**  
For Microlithography Applications

**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)



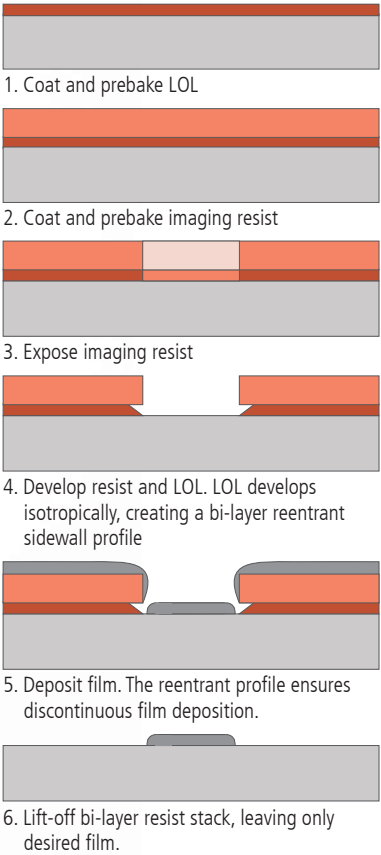
MICROPOSIT LOL 1000 and 2000  
For Bi-Layer Lift-Off Processes

Lift-off Resist – Protective Surface Coating Resist

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 subtractive 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

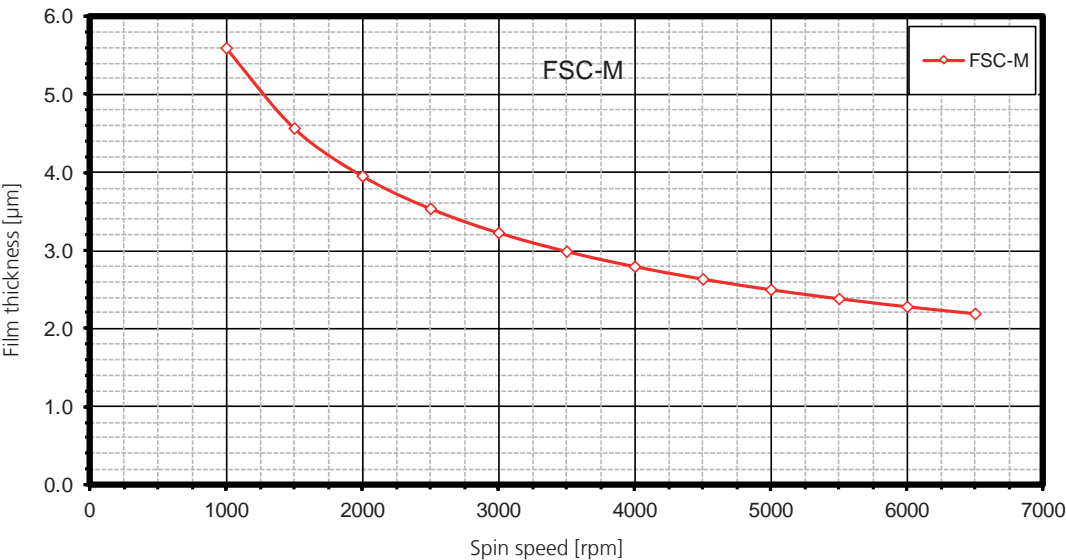


MICROPOSIT FSC – PROTECTIVE SURFACE COATING

**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.

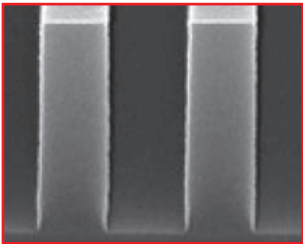
**Microposit FSC Series Surface Coating is available in two thickness ranges.**

- FSC-M: 2.4 to 3.3  $\mu\text{m}$   
For front-side protection during back lapping 0.2  $\mu\text{m}$  filtration

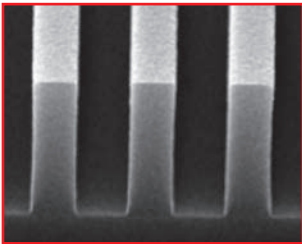




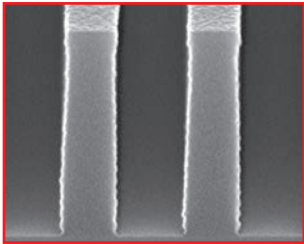
Resist	UV26 3.0	UV26 2.5	UV26 2.0	UV26 1.35	UV26 0.7	UV26G 1.6	UV26G 1.3
Film thickness @ 3000 rpm	3.0 µm	2.5 µm	2.0 µm	1.35 µm	0.7 µm	1.6 µm	1.3 µm
Viscosity / cSt	112	80	58.4	33	12.5	44	31.3
Dose (average for L/S)	30 mJ	27 mJ	25 mJ	20 mJ	15 mJ	22 mJ	20 mJ



2.5 µm Ft / 800 nm L/S 25 mJ

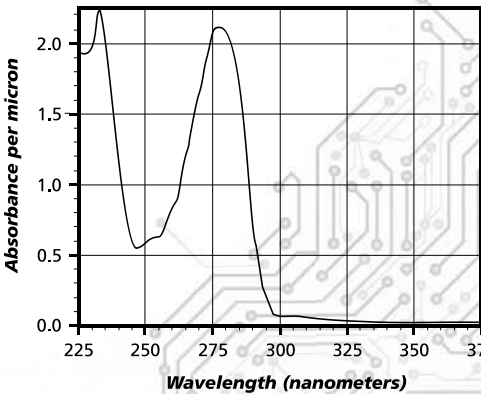


1.8 µm Ft / 600 nm L/S 21 mJ



1.4 µm Ft / 380 nm L/S 19 mJ

Absorbance Curve UV26

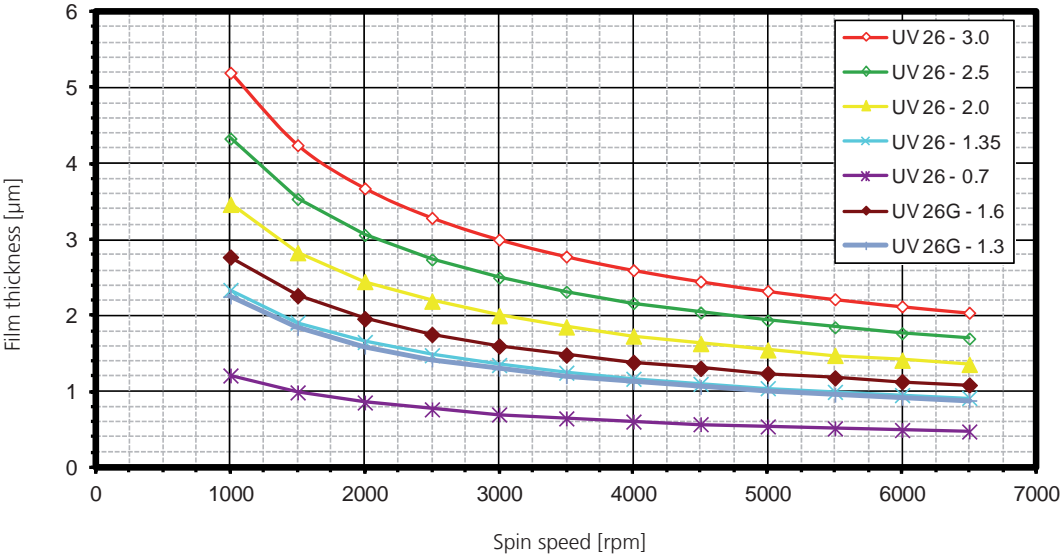


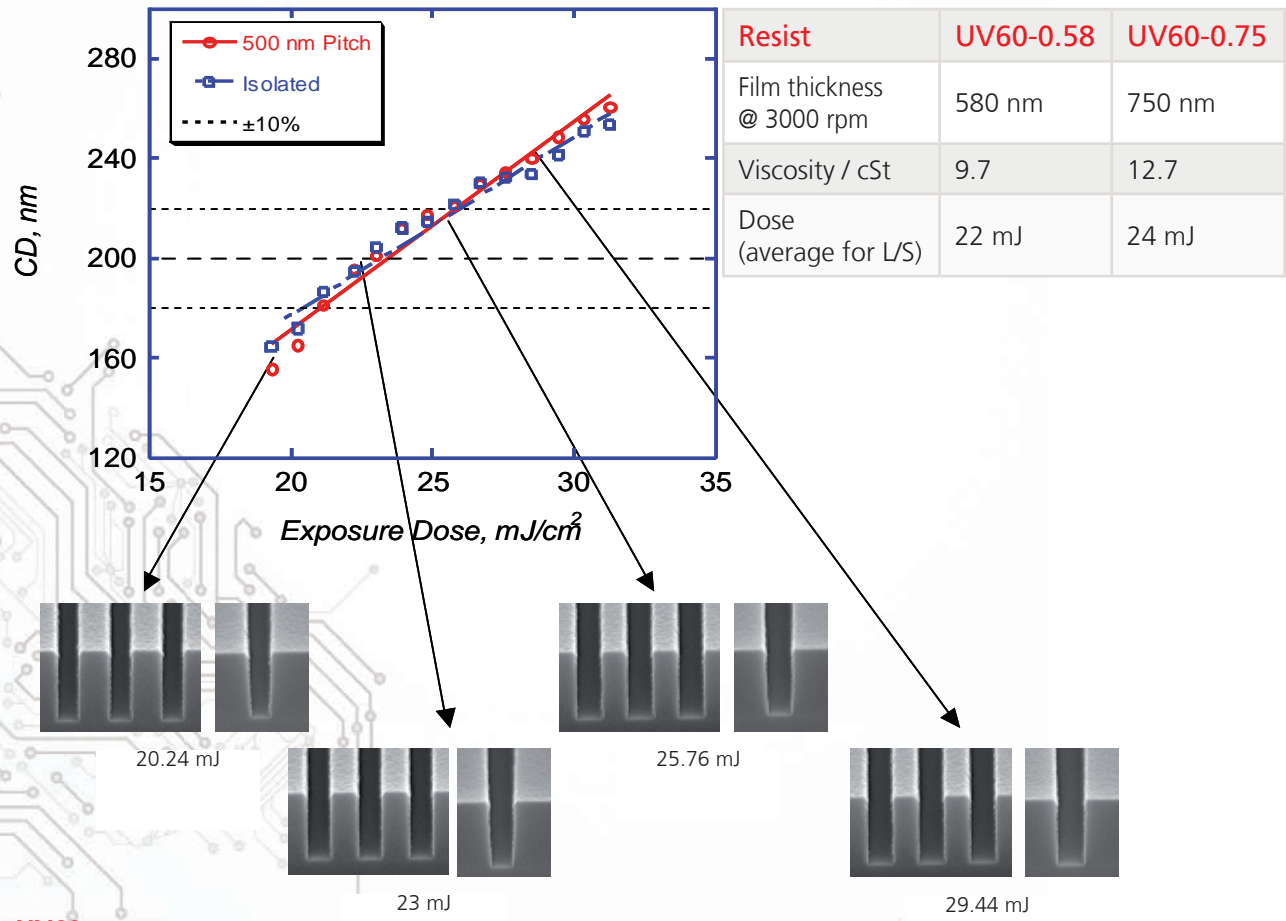
UV26 / UV26G  
Description

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. UV26G is the long term “green” replacement of UV26

Features

- Sizing Energy⇒DoF⇒Resolution**
- 16.5 mJ/cm<sup>2</sup> for 350 nm 1:1 Lines/Spaces at 1.1 µm FT⇒0.80 µm DoF⇒Resolution 240 nm
  - 18.5 mJ/cm<sup>2</sup> for 450 nm 1:1 trenches at 1.8 µm FT⇒1.35 µm DoF⇒Resolution 280 nm
  - 20.5 mJ/cm<sup>2</sup> for 600 nm 1:1 Lines/Spaces at 2.5 µm FT⇒1.0 µm DoF⇒Resolution 500 nm



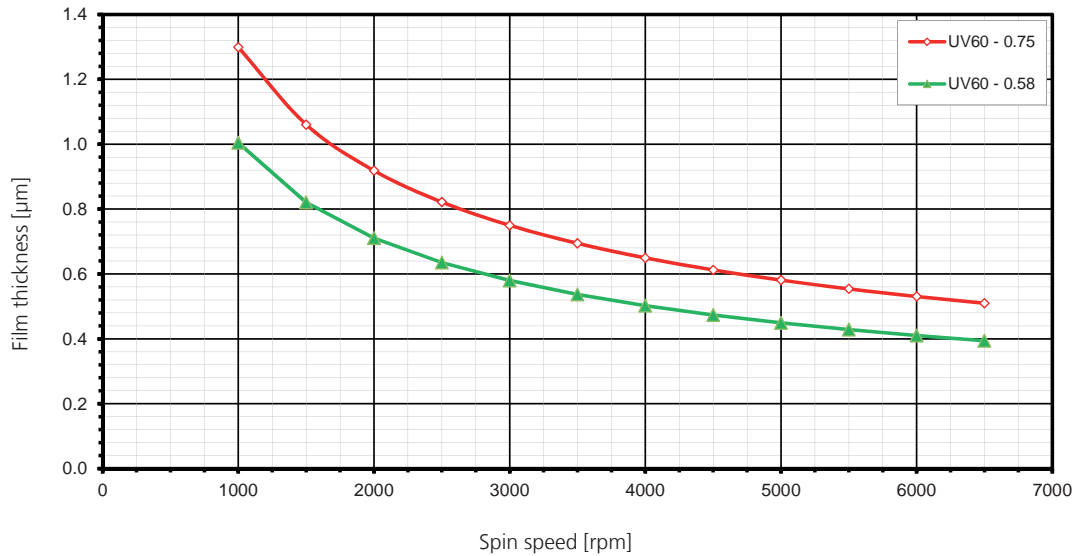


**UV60**  
For Microlithography Applications

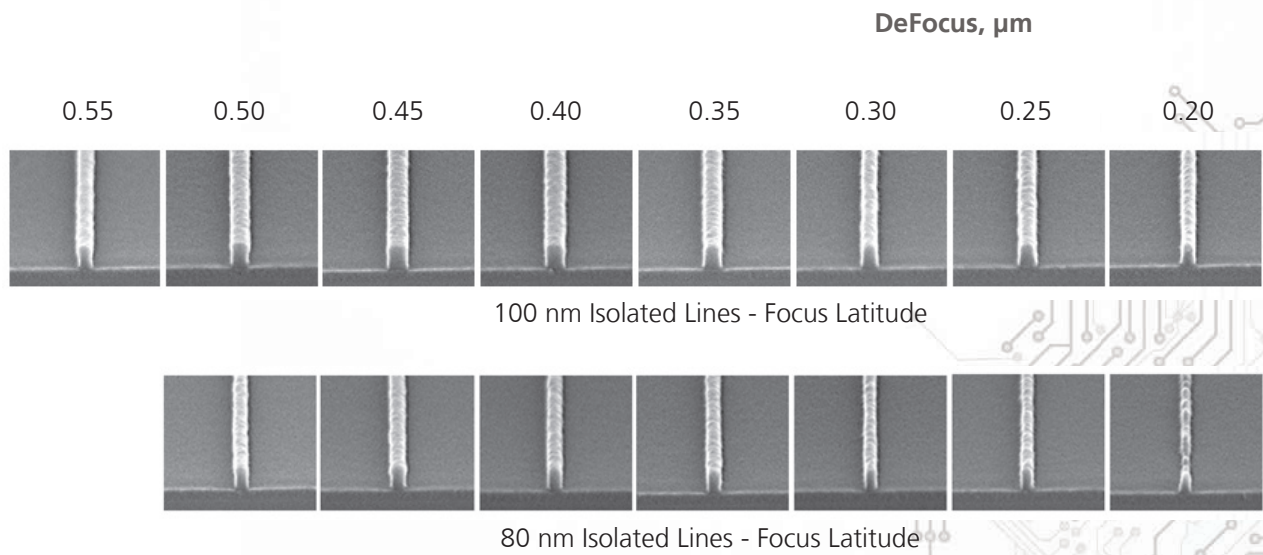
**UV60** is a positive DUV photoresist designed for consolidation of implant, metal contact hole and via applications for 200 nm features. UV60 works well on reflective substrates.

**Advantages**

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



Resist	UV1100-0.38
Film thickness @ 3000 rpm	380 nm
Viscosity / cP	5.9
Dose (for 100nm iso-Line)	43 mJ

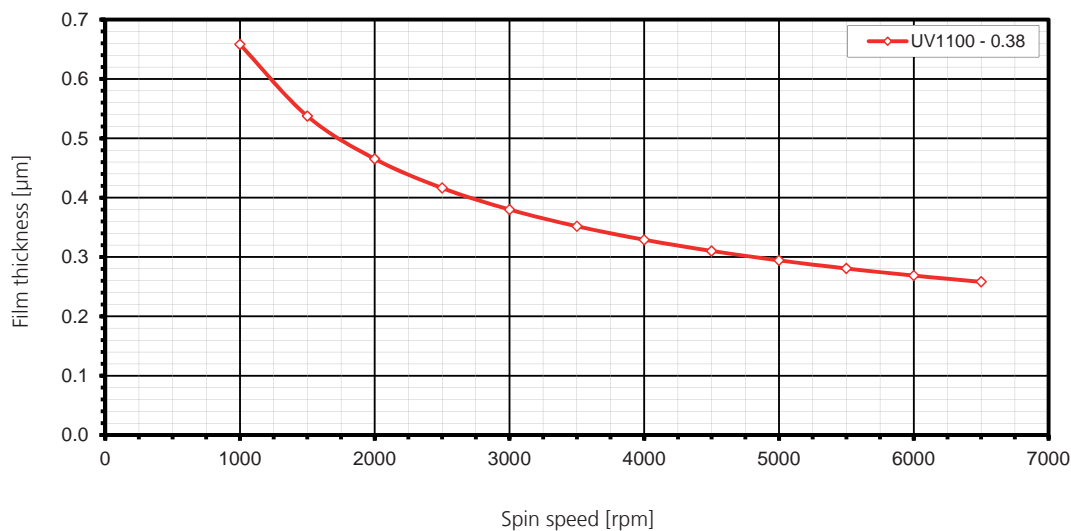


**UV1100**  
Description

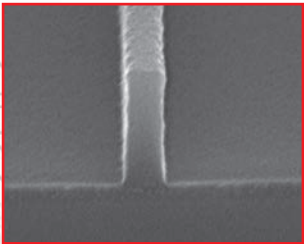
**UV1100** is a high temperature, positive DUV resist . UV1100 features excellent resolution and wide process windows for metal and trench application. UV1100 works well on organic anti-reflectant for hard mask processes and is especially suited for metal trench application.

**Advantages**

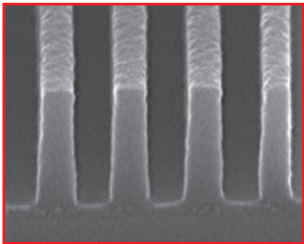
- Low through-pitch bias
- Excellent etch resistance
- Minimal SB/PEB sensitivity
- Good process window
- Good resolution



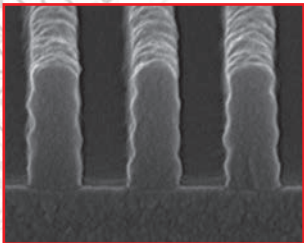
Resist	UV210GS-0.6	UV210GS-0.4	UV210GS-0.3
Film thickness @ 2750 rpm	600 nm	400 nm	300 nm
Viscosity / cSt	13.83	10.07	7.52
Dose (average for L/S)	30 mJ	28 mJ	26 mJ



500 nm Ft/ 180 nm L/S

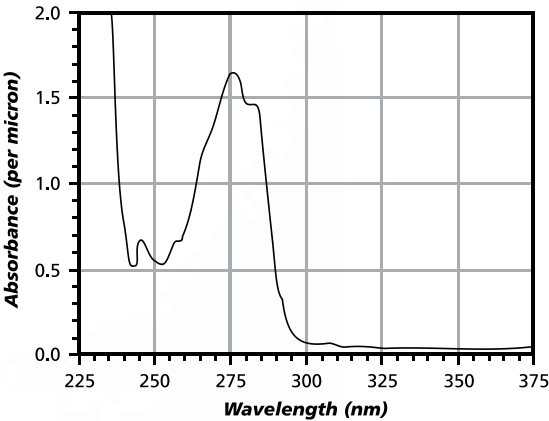


500 nm Ft/ 180 nm L/S



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

Absorbance Curve UV210GS

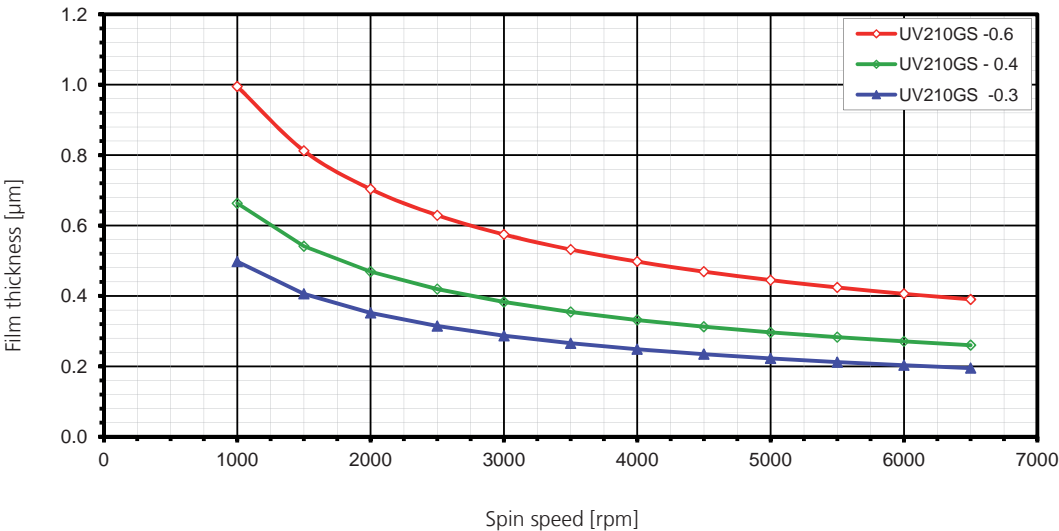


**UV210GS**  
For Microlithography Applications

**UV210GS** is a multipurpose resist that can be utilized for **gate, phase shift mask contact holes and trench applications** in 180 – 130 nm CD range.

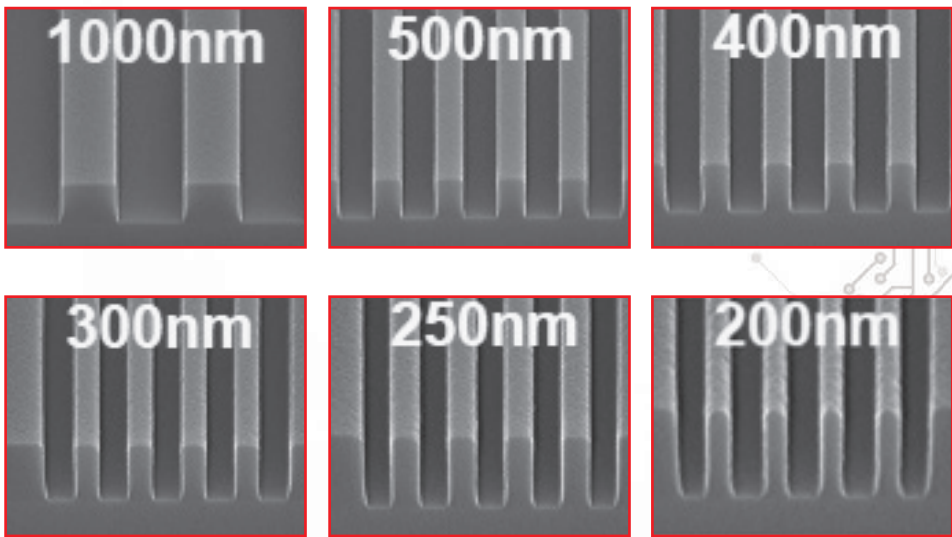
**Features**

- Sizing Energy⇒DoF⇒Resolution**
- 28 mJ/cm<sup>2</sup> for 130 nm 1:1.5 lines / spaces  
⇒ 1.0 μm DoF⇒Resolution 130 nm
  - 33 mJ/cm<sup>2</sup> for 180 nm 1:1 trenches  
⇒ 0.8 μm DoF⇒Resolution 160 nm
  - 60 mJ/cm<sup>2</sup> for 180 nm 1:1 contact holes  
⇒ 0.7 μm DoF⇒Resolution 150 nm (70 nm Bias)





Resist	UVN2300-0.4	UVN2300-0.5	UVN2300-0.8
Film thickness @ 3200 rpm	400 nm	500 nm	800 nm
Viscosity / cSt	3.85	4.77	8.07
Dose (average for L/S)	18 mJ	20 mJ	40 mJ

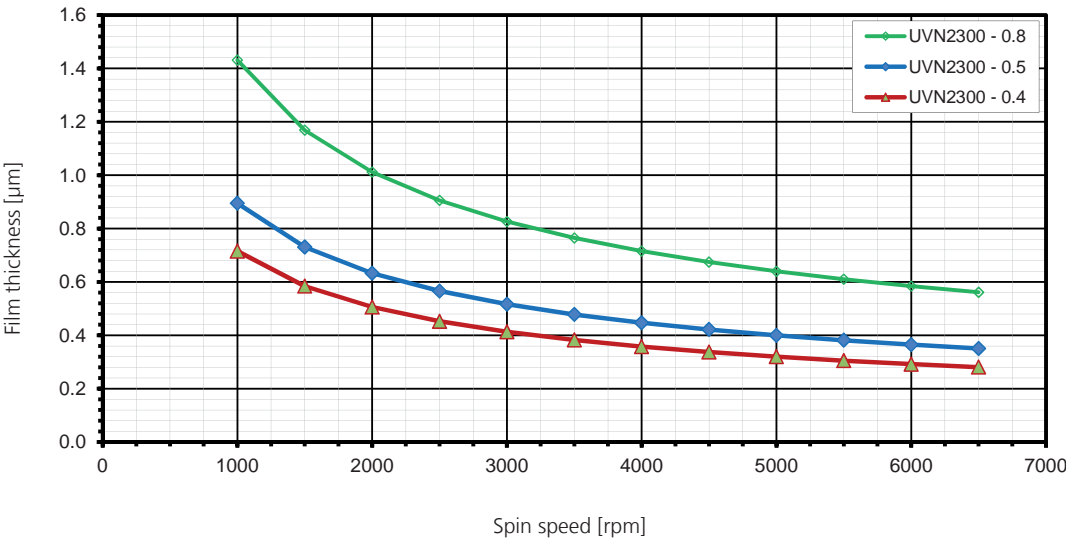














UVN2300  
Description

UVN2300 is a negative PFOS-free photoresist for DUV 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 UVN2300 offers.

Features

- Sizing Energy**
  - 10.0 – 100 mJ for lines and spaces
- Depth of Focus**
  - 1.3 µm DoF for 300 nm semi trench
  - 1.6 µm DoF for 300 nm 1:1 trenches
  - 0.90 µm DoF for 180 nm 1:1 lines/spaces
  - 0.80 µm DoF for 150 nm 1:1 lines/spaces
  - 0.45 µm DoF for 180nm 1:1 CH



248 nm Anti-Reflectants Product Selection Guide					
	Attributes	AR3GSF	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)	1.2	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				
					
		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-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 354 Developer (0.31N)** – concentrate  
**Microposit 351 Developer (1.39N)** – concentrate  
**Microposit 303A Developer (1.7N)** – concentrate  
**Microposit Developer (0.6N)** – concentrate, lowest attack on Aluminum

		S1800 G2	SPR350 SPR3000	SPR220	SPR700	SPR660 SPR680 SPR955CM	ULTRA-i 123	UV26G UV60 UV210GS UV1100	UVN2300
MIF	MF-20A								
	MF-300								
	MF-CD-26								
MIB	351/ 354 Dev								
	303A Dev								
	Micro Dev								

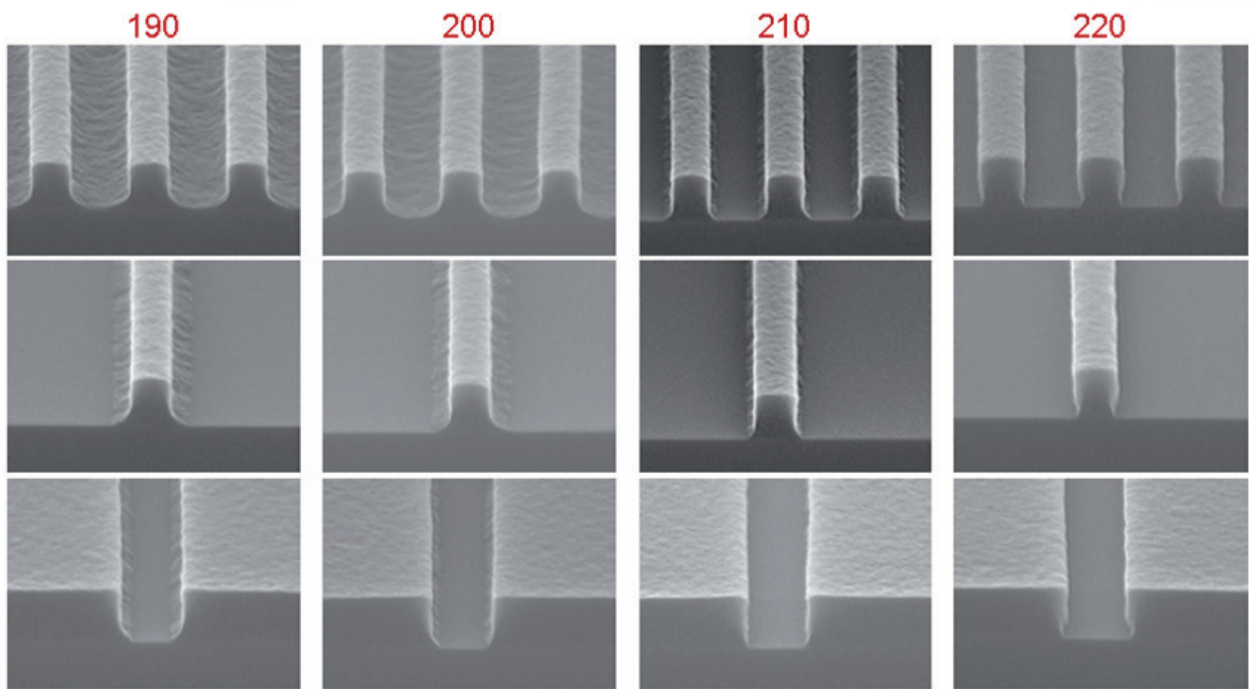
recommended

possible

not recommended

Cure and Dissolution Rate AR602

Cure Temperature, °C

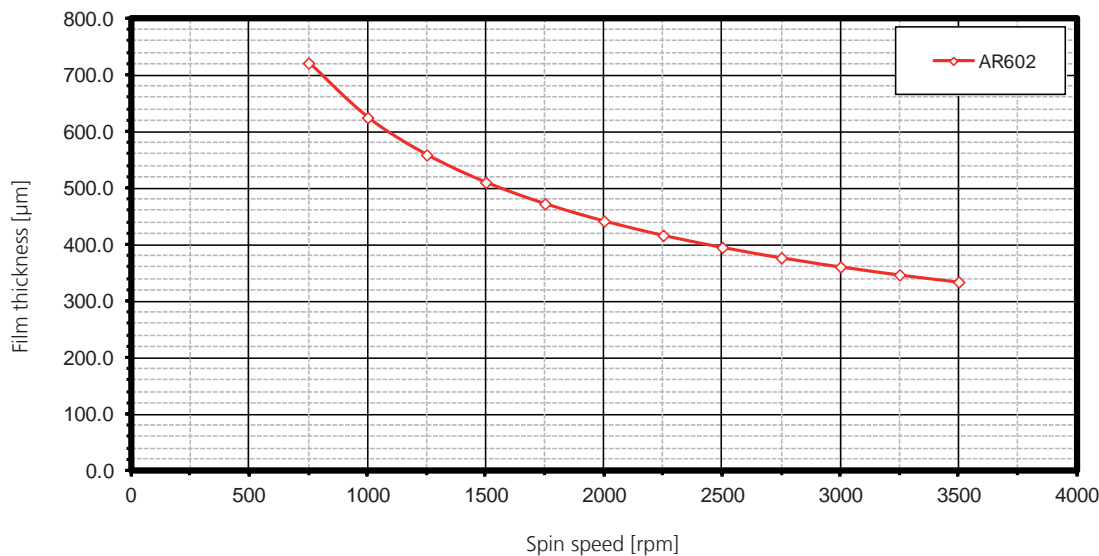


AR602 Description

AR602 is a developable organic bottom anti-reflectant for use in both KrF and ArF application. AR602 is designed for improved performance of critical implant layers while minimizing the negative effects of other implant solution. AR602 has excellent reflection control and improves profile and CDU concerns of a traditional top anti-reflectant-coating.

Advantages

- Optical density at 248nm = 7.5  $\mu\text{m}$  and at 193 = 10.4  $\mu\text{m}$
- Fast minimum thickness at 520Å over reflective substrates
- Turntable dissolution rate with cure temperature
- Product dilution targeted at 510Å
- Compatible with many common EBR solvents
- Excellent CD and Profile control



<b>Edge Bead Removers EBR</b> EC Solvent, EC Solvent 11	<b>NMP-based General Purpose Resist Remover</b> 1165	<b>NMP-free General Purpose Resist Remover</b> SVC-14, 1112A
<b>Polymer Remover Aluminum - Batch Processing</b> ARS-425	<b>Polymer Remover Aluminum - Single Wafer Processing</b> 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



*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 DOW Chemicals (USA), 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 and to DIN ISO 14001 since 2011.



*micro resist technology's* products are:

- Polymers for Nanoimprint Lithography
- (Hybrid Polymers) (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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**micro resist  
technology**

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Register number: HRB 47424

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*micro resist  
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Electronic Materials

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