

EBR-SR14



EBR-SR14 consistently delivers a sharp edge

EBR-SR14 is an advanced solvent formulation specifically designed for modern microlithography applications. SR14 is a blend of the same high purity solvents used in most mainstream photoresists. SR14 effortlessly removes photo resist edge beads that build up during spin coat wafer processing.

Applications include:

- Solvent prewet for reduced resist consumption (RRC)
- Edge bead removal for multiple resist technologies
 - G-Line (i.e. S1800, System 8, SPR2-FX, ...)
 - I-Line (i.e. SPR3000, SPR3600, SPR500, SPR700, SPR955, Ultra-i 120 series, ...)
 - DUV (i.e. UVIIHS, UVIII, UV5, UV6, UV26, UV110 series, UV210, UV400 series, ...)
 - 193 nm (i.e. "S" series, "V" series, ...)
- Edge bead removal for anti-reflective coatings & lift-off layers
 - BARCs (i.e. AR2, AR3, AR7, ...)
 - LOL (i.e. LOL1000, LOL2000, ...)

RRC & Resist Spin Coat Steps

* RRC operation is programmed into specific arm recipes

EBR Steps

top EBR & bottom wash
(actual recipe and track setup may be modified for optimal results)

General Track Coat Recipe

Step	Time sec.	Speed RPM	Accel. RPM	Disp. source
1	1.0	1500	10000	
2*	3.0	1500	10000	1 Resist
3	1.0	2800	10000	
4	1.0	2000	10000	
5	1.0	2000	10000	6 Top EBR
6	5.0	2000	10000	Bottom Rinse 5 & 6
7	1.0	2000	10000	6
8	1.0	2000	10000	
9	5.0	2000	10000	
10	1.0	0	10000	



RRC Operation

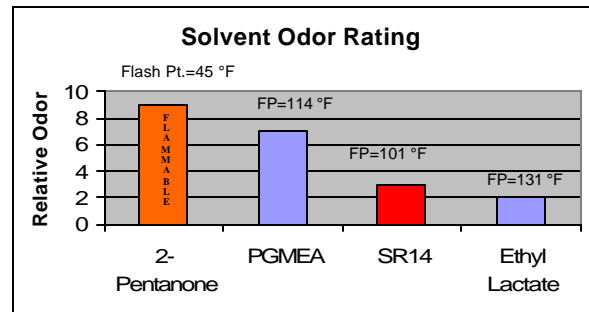
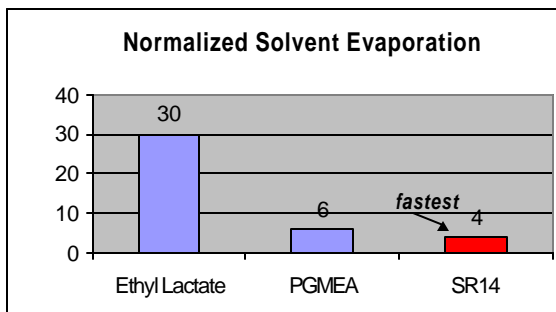
Photo courtesy of TEL America

Reduced Resist Consumption (RRC)

SR14 has proven to be effective as a prewet solvent in advanced photoresist applications for all wafer sizes.

RRC Requirements:

- Very low levels of cationic metals (e.g. Na, K, Li, ...) to minimize contamination on active device regions
- Rapid evaporation to minimize trapped solvent-induced defects on devices
- Environmentally safe low odor formulations
- Maintain integrity to resist priming layer (HMDS), and subsequent photoresist adhesion
- Effective reduced resist dispense for 200 & 300 mm wafers



Substrate: 200 mm Bare Si wafer

Film thickness tool: Thermawave 49 pt. contour map

Resist: 1.5cc of SPR955CM-0.9; 1.5cc of UV 110-0.6

Coater Track: TEL Clean Track Act™ 8

RRC Spin Coat Uniformity
SPR 955 CM-0.9

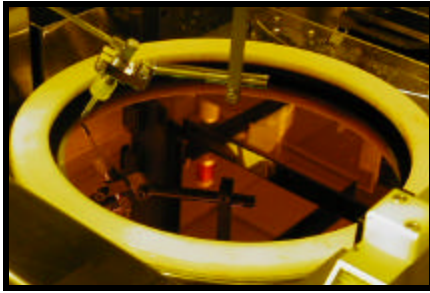
Wafer #	Thickness (Ang)	s (Ang)
1	9004	5.11
2	9005	8.48
3	9004	7.22
4	9013	7.80
5	9016	5.54

RRC Spin Coat Uniformity
UV 110-0.6

Wafer #	Thickness (Ang)	s (Ang)
1	6078	4.60
2	6084	4.67
3	6078	3.64
4	6077	5.04
5	6077	3.64

Top EBR Performance

SR14 is universally applicable across multiple technologies including G-line, I-line, 248nm DUV, 193nm photoresists, LOL, and anti-reflective coatings for all wafer sizes.



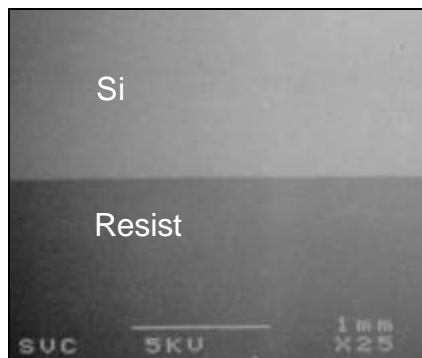
Top EBR Operation

Photo courtesy of TEL America

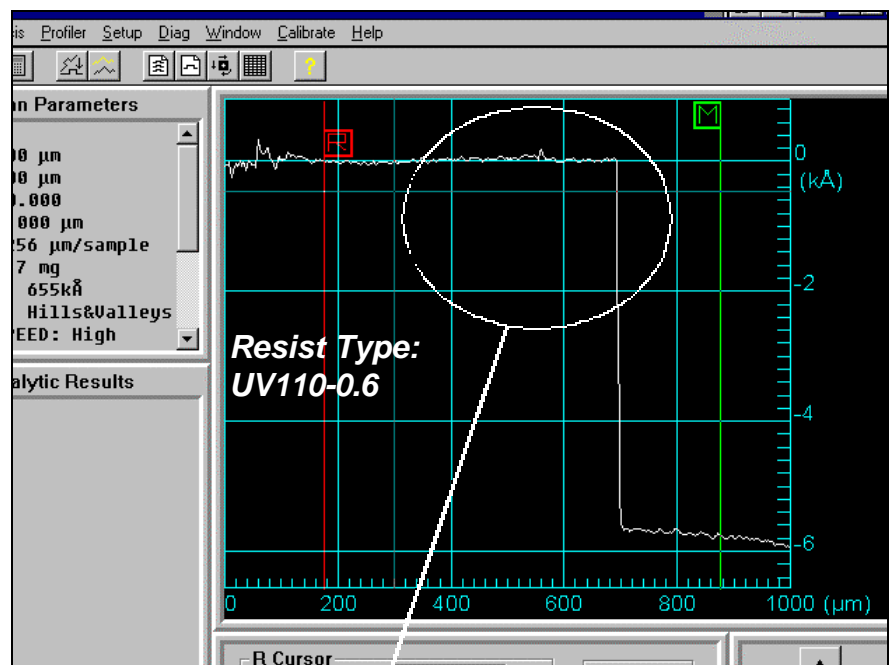
Top EBR Requirements:

- Safe, non-flammable formulation
- Fast dissolution
- Low surface tension
- Minimal resist edge swelling
- Excellent edge acuity

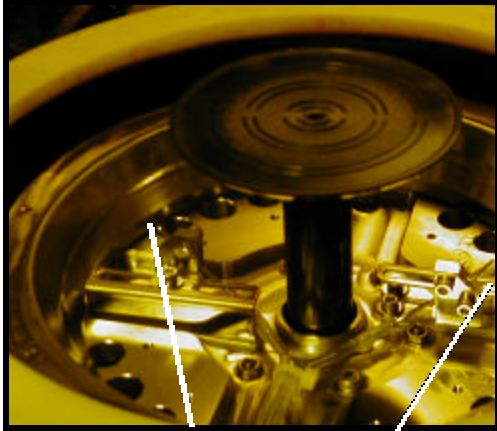
Wavelength	g-Line	i-Line	DUV
Product Name	SPR-2FX	SPR-955	UV5
Dissolution Rate Å/sec.	2,467	9,000	15,000



Top EBR of 0.7µm thick DUV UV5 photoresist on 200mm Si wafer



Negligible resist swelling at resist edge



**Backside EBR Nozzles
(or bottom rinse)**

Photo courtesy of TEL America

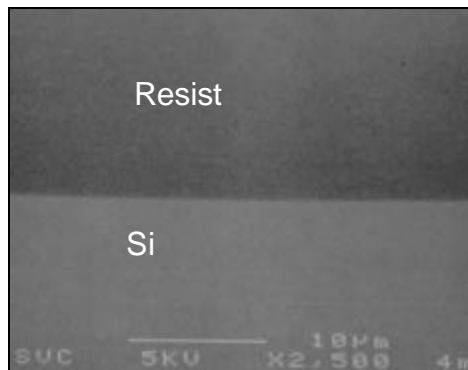
Bottom EBR Performance

SR14 is universally applicable across multiple technologies including G-line, I-line, 248nm DUV, 193nm photoresists and anti-reflective coatings.

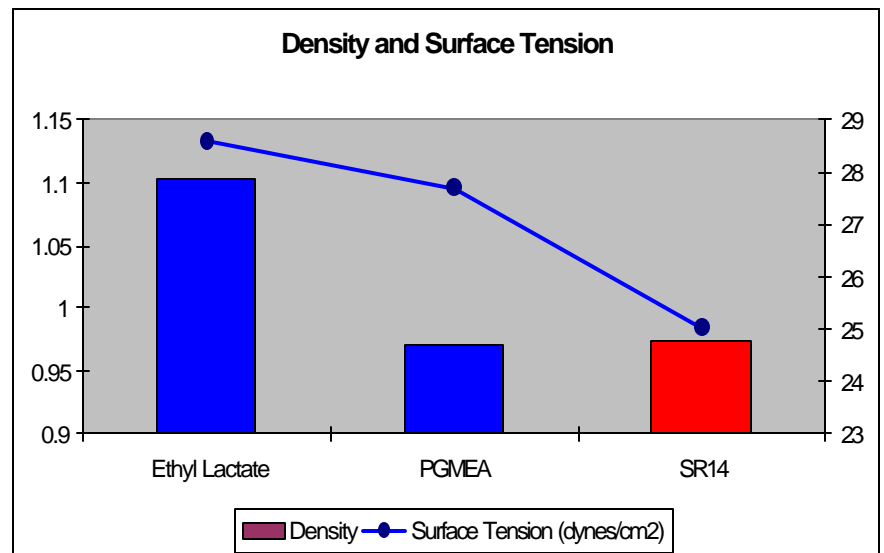
Requirements:

- Good wicking characteristics on 4", 5", & 6" wafers
 - Low viscosity
 - Low density
 - Low surface tension
- -Excellent performance across wafer flat regions
- Fast dissolution
- Excellent edge acuity with no fingers
- Minimal resist edge swelling

Resist coat uniformity wafer to wafer across every lot
(minimal resist bowl evaporative cooling)



*Backside EBR of 0.7 μm thick
DUV UV5 photoresist on Si
wafer*



Packaging

Shipley's ancillary products are packaged in certified low particulate containers designed for high purity electronic chemical applications. HDPE 1 gallon containers are cleanroom packaged and offered in 4 X 1 cases. Also available in HDPE, 55 gallon poly drums with or without Teflon dip tubes for automated chemical delivery systems. For all other custom packaging, contact your principal account manager.

Material Compatibility

Compatible Materials	Incompatible Materials
-----------------------------	-------------------------------

Stainless Steel 304	EPDM
Stainless Steel 316	Quartz
Pyrex or Vycor glass	PVDF (Polyvinyl Fluoride)
Teflon	Polyurethane
Kalrez	Viton
Teflon FEP	Buna-N
Teflon PTFE	Polycarbonate
Teflon Encapsulated O-Ring	PVC
Polypropylene	
Polyethylene	

Glove Compatibility

Butyl gloves are recommended for prolonged contact with chemicals. Heavy duty Neoprene/Latex and Nitrile/Latex have shown good results in laboratory tests.

Polyurethane, Latex, and Vinyl gloves are suitable for temporary, disposable usage. However, test results indicate softening with extended chemical contact.

Pyrex and Vycor are trademarks of Corning Glass Works.
Teflon, Kalrez, and Viton are trademarks of E.I. du Pont de Nemours Co.
Kynar is a trademark of Penwalt Corporation.
Buna-N is a trademark of Pittway Corp.

Handling Precautions

WARNING! Edge Bead Remover SR14 is a combustible liquid containing propylene glycol monomethyl ether acetate. Contact with liquid or vapors causes irritation. Handle with care. Do not get in eyes, on skin, or on clothing. Avoid breathing vapors or mists. Use with adequate ventilation. Wash thoroughly after handling

Personal Protective Equipment

Prior to handling the chemical, approved face shield, splash goggles, impervious gloves, and aprons should be worn. Consult MSDS prior to use for additional personal protective information.

Storage

Store in original sealed container, in a cool, dry, well ventilated area. Keep away from heat and any source of ignition. Segregate from strong oxidizing agents and acids. SR14 has a 1 year shelf life.

Consult MSDS for details.

Waste Disposal

Spent process solvent can directly go into the organic solvent waste collection. All methods of disposal should comply with local, and federal regulatory requirements.