

Technical datasheet

AZ[®] IPS-6000 Series Photoresist

Chemically Amplified Positive Tone Photoresist

APPLICATIONS

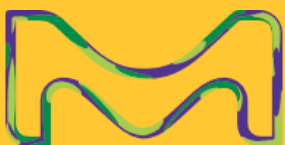
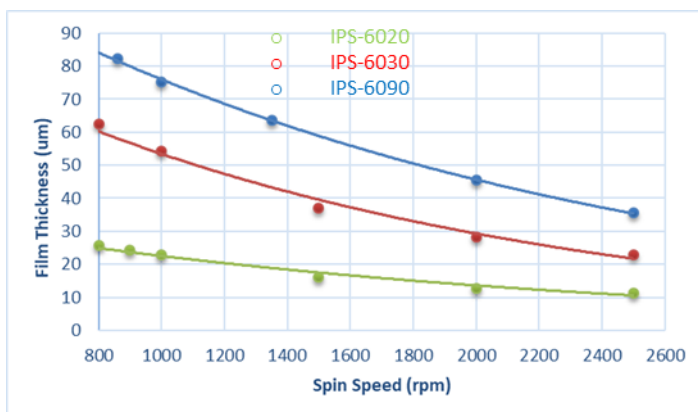
Thick positive tone chemically amplified photoresist featuring aspect ratios and photospeed not possible with conventional DNQ type materials. These photoresists expose and develop very quickly for improved equipment productivity and reduced chemical usage.

- High Resolution, High Photo Speed, High Aspect Ratio >8
- Straight Profile, Footing Free (Undercut)
- PCD >24 h PED 24 h
- No post bake rehydration delays required
- Single coat thicknesses from 20 to 100µm
- KOH & TMAH Compatibility Excellent Stripping

TYPICAL PROCESS

- Soft Bake: 130°C (ramped) Rehydration Hold: None
- Expose: 365nm sensitive
- Post Expose Bake*: 100°C/100s Develop: Puddle, spray or immersion
- Developer Type: MIF
- * PEB is required for proper imaging

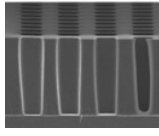
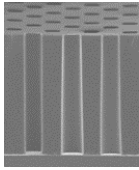
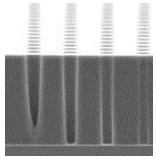
SPIN CURVE (200MM SILICON)



OPTICAL/MODELLING CONSTANTS*

Cauchy A	1.5697
Cauchy B (μm^2)	0.00936
Cauchy C (μm^4)	0.00001
n @ 633nm	1.582
K @ 633nm	0.0002

Aspect ratio with various exposure tool

SEM			
	ALIGNER	ULTRATECH	CANON
Exposure tool	ALIGNER	ULTRATECH	CANON
Film thickness	50 μm	80 μm	60 μm
CD	10 μm	10 μm	5 μm
Aspect ratio	5:1	8:1	12:1

* Unexposed photoresist film

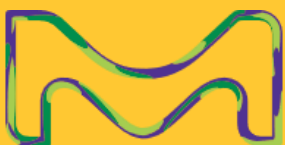
COMPANION PRODUCTS

THINNING/EDGE BEAD REMOVAL

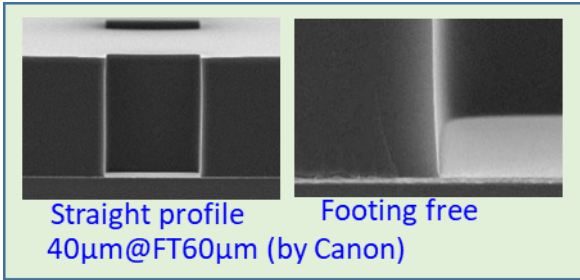
AZ[®] EBR Solvent or AZ EBR 70/30

MIF DEVELOPERS

AZ 300 MIF

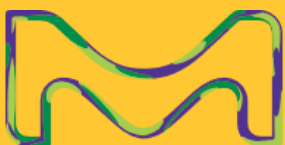


PROFILE AND PLATING



Comparable plating chemistry and SEM inspection of plated bump

Cu	SC20, SC40, SC50, MSA100, Cu8540, Cu1000, Cu350		
Ni	Ni100, Ni200, Niceki Surfamate (Surtec)		
SnAg	TS140, TS202, TS304, BPTS4000		
Others	Au- Au660;		
Micropillar bump (Cu/Ni/SnAg)		Mushroom bump (Cu/Ni/SnAg)	
Cu350/20µm	Ni100/20µm	Au660/ 20µm	Cu350/Ni100/Au660-10/3/1µm
Cu1000/ 26µm	SC50- Cu RDL	Cu1000/Ni100-15/5µm	Cu1000/Ni100/TS304-15/5/35µm



PROCESS CONSIDERATIONS

SUBSTRATE PREPARATION

Substrates must be clean, dry, and free of organic residues. Oxide forming substrates (Si, etc.) should be HMDS primed prior to coating AZ IPS. Contact your AZ product representative for detailed information on pre-treating with HMDS.

SOFT BAKE

Soft bake times and temperatures may be application specific. Process optimization is recommended to ensure optimum pattern profiles and stable lithographic and adhesion performance. Soft bake temperatures for AZ IPS should be in the 125°C-135°C range. Ramped temperature or plate proximity is required to prevent bubbling of the film due to rapid solvent evaporation.

COATING

As with all ultra-high viscosity materials, careful optimization of nozzle height, dispense rate, dispense volume, and spin parameters is necessary to prevent bubble/voids in the final film. To hand coat AZ®IPS, transfer a small amount of material into a small beaker with an integrated pour spout and wait for any bubbles to dissipate. Apply the photoresist by pouring directly from the beaker in close proximity to the wafer surface. Use of a pipette or dropper is not recommended. Final film thickness will be determined by the combination of spin speed and spin time. Refer to the example spin curve data for more information.

EXPOSURE

AZ IPS requires exposure energy at the 365nm wavelength.

POST EXPOSE BAKE

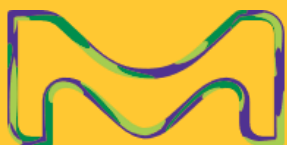
A PEB is required for proper imaging of AZ® IPS. PEB temperatures and times may be application specific. As a general rule, PEB temperatures should be in the 80°C to 110°C range.

DEVELOPING

AZ IPS Photoresist is compatible with industry standard 0.26N (2.38%) TMAH developers. AZ 300MIF is recommended.

HARD BAKE

Hard baking (post develop bake) may improve adhesion in wet etch applications and improves pattern stability in dry etch processes. Hard Baking is typically not required for plating applications. Hard bake temperatures should be in the 80°C to 85°C range to ensure minimal thermal distortion of the pattern.



STRIPPING

AZ IPS Photoresist is compatible with industry standard solvent based removers. AZ Kwik Strip is recommended.

COMPATIBLE MATERIALS

AZ IPS resist is compatible with all commercially available lithography processing equipment. Compatible materials of construction include glass, quartz, PTFE, PFA, stainless steel, HDPE, polypropylene, and ceramic.

HANDLING/DISPOSAL

AZ IPS resist contains PGMEA (1-Methoxy-2-propanol acetate). Refer to the current version of the MSDS and to local regulations for up to date information on safe handling and proper disposal. Wear solvent resistant gloves, protective clothing, and eye/face protection.

AZ IPS resist is compatible with drain lines handling similar organic solvent based materials.

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