



Plasma-etching stable Positive Photoresist X AR-P 3220/7

Experimental sample

Thick temperature-stable positive photoresist

Experimental sample/custom-made product

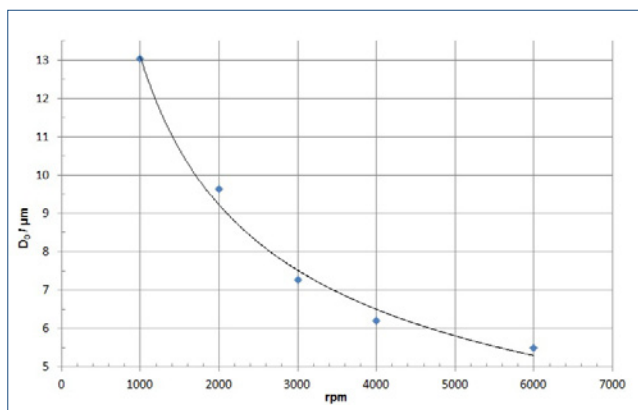
Characterisation

- broadband, i-line, g-line
- high photosensitivity, good resolution
- very plasma etching stable, thermally stable up to 130 °C
- 12 µm with single spin coating step (1000 rpm) possible
- combination of novolac and naphthoquinone diazide
- safer solvent PGMEA

Properties I

Parameter / X AR-P	3220/7
Solids content (%)	43
Viscosity 25 °C (mPas)	385
Film thickness/4000 rpm (µm)	6
Resolution (µm)	1.5
Contrast	4.0
Flash point (°C)	42
Storage 6 month (°C)	10 - 18

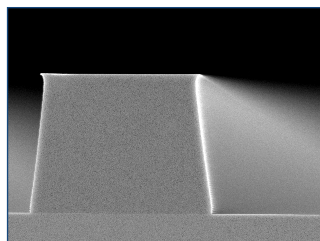
Spin curve



Properties II

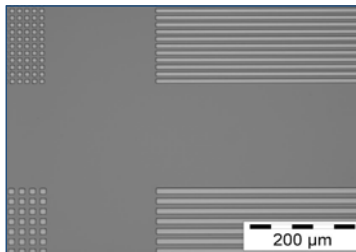
Glass transition temperature (°C)	108	
Dielectric constant	3.1	
Cauchy coefficients	N ₀	1.605
	N ₁	79.5
	N ₂	105.1
Plasma etching rates (nm/min) (5 Pa. 240-250 V Bias)	Ar-sputtering	5
	O ₂	158
	CF ₄	29
	80 CF ₄ + 16 O ₂	80

Structure resolution



X AR-P 3220/7
3 µm bars at a film thickness of 10 µm

Resist structures



Resist structures at a film thickness of 10 µm

Process parameters

Substrate	Si 4" wafer
Tempering	95 °C, 180 s, hot plate
Exposure	g-line stepper (NA: 0.56)
Development	AR 300-26. 1 : 2, 120 s, 22 °C

Process chemicals

Adhesion promoter	AR 300-80 new
Developer	AR 300-26
Thinner	AR 300-12
Remover	AR 300-76, 600-70

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Process conditions

This diagram shows exemplary process steps for resist X AR-P 3220/7. All specifications are guideline values which have to be adapted to own specific conditions. For further information on processing ↗ "Detailed instructions for optimum processing of photoresists". For recommendations on waste water treatment and general safety instructions ↗ "General product information on Allresist photoresists".

Coating with X AR-P 3220/7		4000 rpm, 60 s, 6.0 μm
Tempering (± 1 °C)		95 °C, 2 min, hot plate or 90 °C, 30 min, convection oven
UV exposure		Broadband UV, 365 nm, 405 nm, 436 nm Exposure dose (E ₀ , BB-UV stepper): 160 mJ/cm ²
Development (21-23 °C ± 0.5 °C) puddle Rinse		AR 300-26, 1 : 2 1 min DI-H ₂ O, 30 s
Post-bake (optional)		110 °C, 1 min hot plate or 110 °C, 25 min convection oven
Customer-specific technologies		Generation of e.g. semi-conductor properties, plasma etching or electroplating
Removal		AR 300-76 or O ₂ plasma ashing

Supplementary information

This resist was originally developed for customer-specific plasma etching technologies and very well meets all demands of this technology. The resist can however also be used for all other thick resist applications in microelectronics or microsystems technology.

This resist formulation is currently successfully processed by our customers, may however also be modified according to new customer's requirements.