



## Polyimide Photoresist SX AR-P 5000/82.7

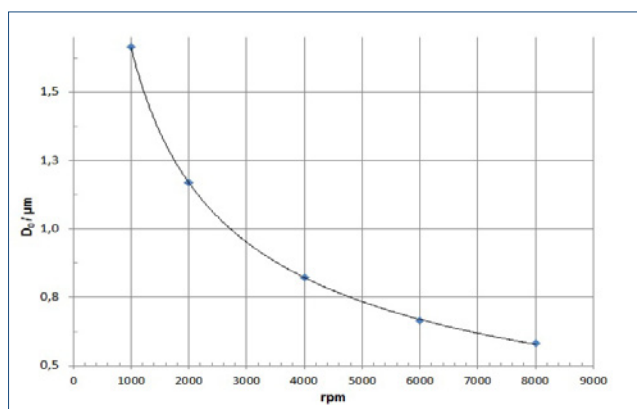
### Thermally stable positive resist for plasma/implantation processes

Experimental sample/custom-made product

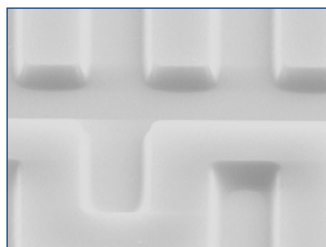
#### Characterisation

- i-line, g-line, BB-UV
- very high plasma etching stability, thus well suited for plasma and implantation processes
- thermally stable up to 450 °C
- no curing required
- combination of polyimide and naphthoquinone diazide
- safer solvent PGMEA and N-Ethylpyrrolidon

#### Spin curve



#### Structure resolution



SX AR-P 5000/82.7  
1.5 µm resolution after development of a 0.8 µm film

#### Process parameters

Substrate	Si 4" wafer
Soft bake	85 °C, 2 min, hot plate
Exposure	Maskaligner MJB 3, contact exposure
Development	AR 300-26, 1 : 2, 90 s, 22 °C

#### Properties I

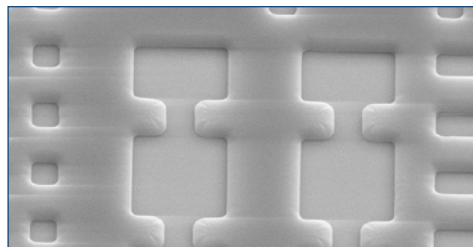
Parameter / SX AR-P	5000/82.7
Solids content (%)	15
Viscosity 25°C (mPas)	25
Film thickness/4000 rpm (µm)	0.8
Resolution (µm)	1.5
Contrast	2
Flash point (°C)	53
Storage temperature (°C)*	8 - 12

\* Products have a guaranteed shelf life of 6 Month from the date of sale if stored correctly and can also be used without guarantee until the date indicated on the label.

#### Properties II

Glass transition temperature °C	170	
Dielectric constant	2.9	
Cauchy coefficients	N <sub>0</sub>	1.609
	N <sub>1</sub>	58.9
	N <sub>2</sub>	248.3
Plasma etching rates (nm/min) (5 Pa. 240-250 V Bias)	Ar-sputtering	5
	O <sub>2</sub>	199
	CF <sub>4</sub>	41
	80 CF <sub>4</sub> + 16 O <sub>2</sub>	188

#### Resist structures



Resist structures at film thickness of 10 µm



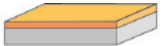
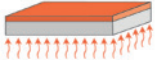
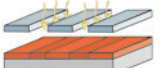
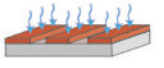
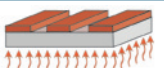
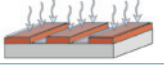

#### Process chemicals

Adhesion promoter	AR 300-80 new
Developer	AR 300-26
Thinner	X AR 300-12/3
Remover	AR 300-76, 300-73

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## Process conditions

This diagram shows exemplary process steps for resist SX AR-P 5000/82.7. All specifications are guideline values which have to be adapted to own specific conditions. For recommendations on waste water treatment and general safety instructions ↗ "General product information on Allresist photoresists".

Pre-coating with AR 300-80		Adhesive bonding, resulting film thickness 15 nm
1. Soft bake		180 °C, 2 min hot plate or 180 °C, 25 min convection oven
Coating with SX AR-P 5000/82.7		4000 rpm, 60 s , 0.8 µm
2. Soft bake (± 1 °C)		95 °C, 2 min hot plate or 85 °C, 30 min convection oven
UV exposure		g-line Stepper (Broadband UV, 365 nm) Exposure dose ( $E_0$ , BB-UV stepper): 200 mJ/cm <sup>2</sup> , 1.6 µm
Development (21-23 °C ± 0.5 °C) puddle		AR 300-26, 1 : 2 2 min
Rinse		DI-H <sub>2</sub> O, 30 s
Post-bake		Up to 170 °C, 1 min hot plate (removal just still possible) (up to 300 °C possible, but no removal any more)
Customer-specific technologies		Generation of e.g. semi-conductor properties
Removal		AR 300-76 or O <sub>2</sub> plasma ashing

## Processing instructions

The addition of the photosensitive component generates a photo-structurable polyimide. The first tempering step (softbake) may thus not be performed at temperatures above 100 °C.