

## Positive Photoresist for Lift-off AR-P 5300

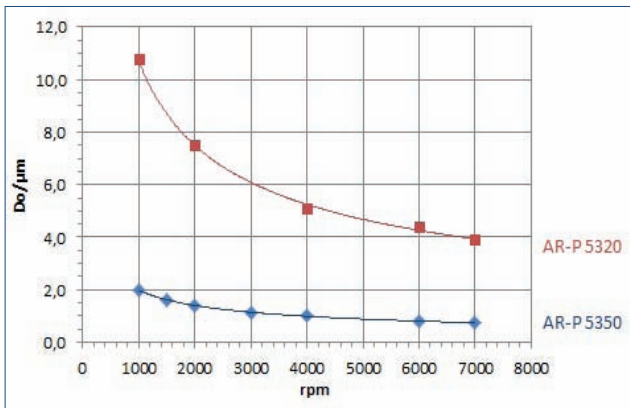
### AR-P 5300 photoresist series for lift-off applications

Sensitive positive-tone resists for the production of evaporation samples

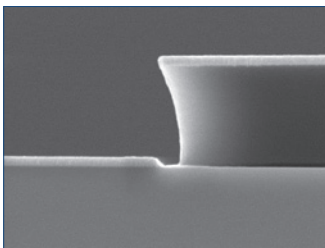
#### Characterisation

- broadband UV, i-line, g-line
- high photosensitivity, high resolution
- good adhesion properties
- for undercut structures for the production of evaporation samples, in particular of metal using lift-off techniques e.g. for conductor paths
- plasma etching resistant, temperature stable up to 120 °C
- combination of novolac and naphthoquinone diazide
- safer solvent PGMEA

#### Spin curve



#### Lift-off resist structures



AR-P 5350  
Lift-off resist structure after metal evaporation

#### Properties I

Parameter / AR-P	5320	5350
Solids content (%)	39	28
Viscosity 25 °C (mPas)	250	13
Film thickness (μm)	5.0	1.0
Resolution (μm)	2.0	0.5
Contrast	4.0	5.0
Flash point (°C)	42	
Storage 6 month (°C)	10 - 18	

#### Properties II

Glass transition temperature	108	
Dielectric constant	3.1	
Cauchy coefficients	N <sub>0</sub>	1.623
	N <sub>1</sub>	166.8
	N <sub>2</sub>	10
Plasma etching rates (nm/min) (5 Pa, 240-250 V bias)	Ar-sputtering	7
	O <sub>2</sub>	161
	CF <sub>4</sub>	39
	80 CF <sub>4</sub> + 16 O <sub>2</sub>	90

#### Resist structures



AR-P 5320  
Lift-off resist structure after development

#### Process parameters

Substrate	Si 4" wafer
Tempering	100 °C, 4 min, hot plate
Exposure	g-line stepper (NA: 0.56)
Development	AR 300-35, I : 2, 60 s, 22 °C


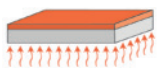
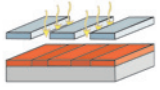
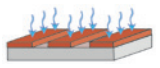
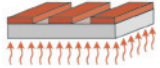
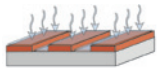
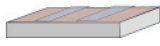
#### Process chemicals

Adhesion promoter	AR 300-80
Developer	AR 300-26
Thinner	AR 300-12
Remover	AR 300-76, AR 300-73

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### Process conditions

This diagram shows exemplary process steps for AR-P 5300 resists. 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		AR-P 5320 6000 rpm, 60 s 4.0 µm	AR-P 5350 4000 rpm, 60 s 1.0 µm
Tempering ( $\pm 1$ °C)		100 °C, 4 min hot plate or 95 °C, 40 min convection oven	
UV exposure		Broadband UV, 365 nm, 405 nm, 436 nm Exposure dose ( $E_0$ , broadband UV stepper):	
		58 mJ/cm <sup>2</sup>	55 mJ/cm <sup>2</sup>
Development (21-23 °C $\pm$ 0,5 °C) puddle		AR 300-26, 3 : 2 2 min	AR 300-35, 1 : 2 60 s
Rinse		DI-H <sub>2</sub> O, 30 s	
Post-bake (optional)		Not required	
Customer-specific technologies		Generation of e.g. semiconductor properties or lift-off	
Removal		AR 300-76 or O <sub>2</sub> plasma ashing	

### Processing instructions

Tempering: Higher tempering temperatures are required to produce the undercut.

Development: The undercut of resist structures is generated during aqueous-alkaline development.

### Development recommendations

Resist / Developer	AR 300-26	AR 300-35	AR 300-40
AR-P 5320	2 : 1 to 3 : 2 (1-3 min)	-	-
AR-P 5350	1 : 7	1 : 2	300-47, 2 : 3