ALLRESIST

Innovation
Creativity
Customer-specific solutions

Protective Coating SX AR-PC 5000/41

Experimental sample

KOH and HF resistant protective coating for wafer backside protection

Experimental sample/custom-made product

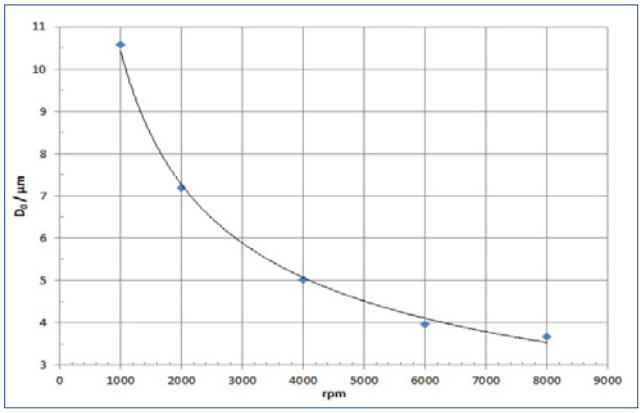
Characterisation

- not light-sensitive > 300 nm, no yellow light required
- stable protective film for protecting the wafer backside during etching of the front up to 80 °C, e.g. with 40 % caustic potash, 50 % hydrofluoric acid, BOE
- in two-layer system structurable with AR-P 3250 or AR-N 4400-05/10; plasma etching resistant
- high-melting modified hydrocarbons
- solvent ethylbenzene

Properties I

Parameter / AR-PC	5000/41
Solids content (%)	50
Viscosity 25°C (mPas)	45
Film thickness/4000 rpm (µm)	5.0
Resolution (µm. 2-Layer)	20
Contrast (2-Layer)	1
Flash point (°C)	15
Storage 6 month (°C)	15 - 22

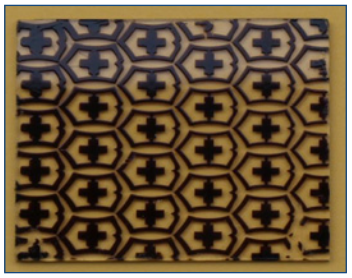
Spin curve



Properties II

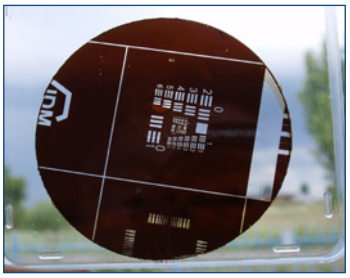
Glass transition temperature °C	130	
Dielectric constant	-	
Cauchy-Koeffizienten	N_0	-
	N_1	-
	N_2	-
Plasma etching rates (nm/min) (5 Pa. 240-250 V Bias)	Ar-sputtering	-
	O_2	185
	CF_4	68
	80 CF_4 + 16 O_2	120

Resist structures



Two-layer structuring with SX AR-PC 5000/41 and AR-P 3250 (on the left resist mask, on the right after etching in glass)

Structurable glass wafer



5 µm thick layer with glass wafer provided by the IDM

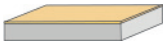
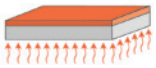
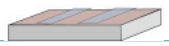
Process chemicals

Adhesion promoter	AR 300-80 new
Developer	X AR 300-74/1
Thinner	X AR 300-74/1
Remover	

Protective Coating SX AR-PC 5000/41

Process conditions - One-layer process

This diagram shows exemplary process steps for the protective coating SX AR-PC 5000/41. All specifications are guideline values which have to be adapted to own specific conditions.

Pre-coating with AR 300-80 new 	Adhesive bonding at 2000 rpm, resulting film thickness 15 nm
1. Soft bake (± 1 °C) 	95 °C, 2 min hot plate or 95 °C, 25 min convection oven
Coating protective film with SX AR-PC 5000/41 	3500 rpm, 60 s , 5.5 µm
2. Softbake (± 1 °C) 	95 °C, 5 min hot plate 95 °C, 25 min convection oven
Hard bake (optional) 	120 °C, 5 min hot plate or 25 min convection oven for higher etch stability
Removal AR-PC 5000/41	X AR 300-74/1, 30 s

Processing instructions

Coating: A spin speed of 1000 rpm is recommended, since wafer edges are optimally protected due to the slight wrapping effect at a film thickness of approx. 10 µm during spin deposition.

Etch process: The protective layer is not attacked over hours.

Note: The protective film is not dissolved in acetone or isopropanol. For removal or cleaning of equipment, the respective thinner has to be used.

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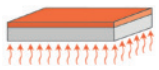
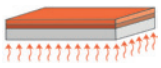
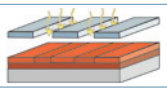
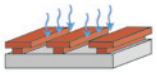
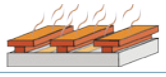
Protective Coating SX AR-PC 5000/41

Experimental sample

Process conditions - Two-layer process

This diagram shows exemplary process steps for the protective coating SX AR-PC 5000/41. All specifications are guideline values which have to be adapted to own specific conditions.

Pre-coating with AR 300-80 new		Adhesive bonding at 2000 rpm, resulting film thickness 15 nm
1. Soft bake (± 1 °C)		95 °C, 2 min hot plate or 95 °C, 25 min convection oven
Coating protective film with SX AR-PC 5000/41		3500 rpm, 60 s , 5.5 µm
2. Soft bake (± 1 °C)		95 °C, 5 min hot plate 95 °C, 25 min convection oven
Coating AR-P 3250		1000 rpm, 10 µm
3. Tempering (± 1 °C)		50 °C, 5 min hot plate or 50 °C, 40 min, convection oven
UV exposure		Broadband UV, 365 nm, 405 nm, 436 nm Exposure dose (E_0, BB-UV stepper): 450 mJ/cm^2
Development (21-23 °C ± 0.5 °C) puddle		1. AR-P 3250 with AR 300-26 (1 : 1), 60 s 2. SX AR-PC 5000/41 with X AR-300-74/1, 10 s
Rinse / Stop		DI-H_2O, 30 s / stopper AR 600-60/1, 30 s
Removal AR-P 3250 (optional)		AR 300-73, 60 s
Customer-specific technologies		Etching with 50 % hydrofluoric acid
Removal AR-PC 5000/41		X AR 300-74/1, 30 s

Processing instructions

Coating: A spin speed of 1000 rpm is recommended, since wafer edges are optimally protected due to the slight wrapping effect at a film thickness of approx. 10 µm during spin deposition.

Etch process: The protective layer is not attacked over hours up to 80 °C.

Note: The protective film is not dissolved in acetone or isopropanol. For removal or cleaning of equipment, the respective thinner has to be used.