Protective Coating SX AR-PC 5000/41

KOH and HF resistant protective coating for wafer backside protection

Experimental sample/custom-made product

Characterisation

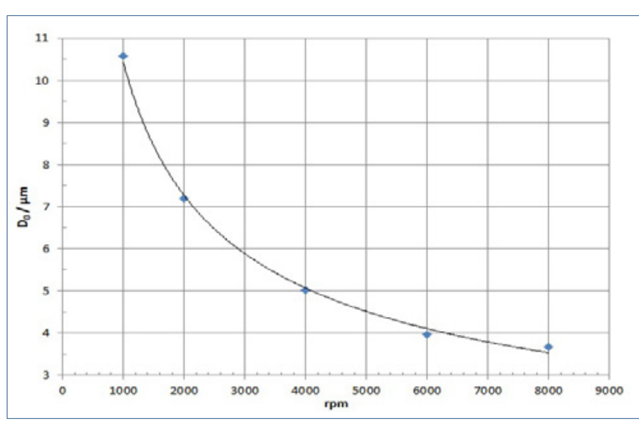
- not light-sensitive > 300 nm, no yellow light required
- stable protective film for protecting the wafer backside during etching of the front up to 80 °C, e.g. with 40 % caustic potash, 50 % hydrofluoric acid, BOE
- in two-layer system structurable with AR-P 3250 or AR-N 4400-05/10; plasma etching 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 temperature (°C)*	15 - 22

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

Spin curve



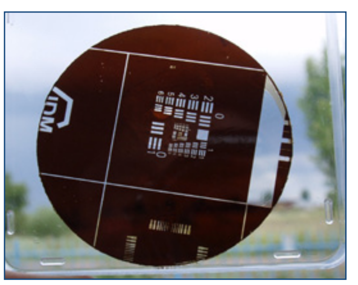
Properties II

Glass transition temperature °C	130	
Dielectric constant	-	
Cauchy-Koeffizienten	N_0	-
	N_1	-
	N_2	-
Plasma etching rates (nm/min)	Ar-sputtering	-
(5 Pa. 240-250 V Bias)	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

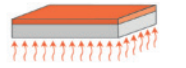
Process chemicals

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.

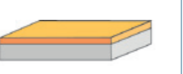
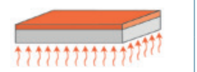
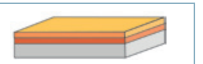
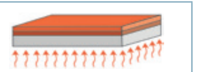
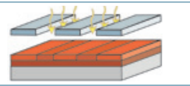
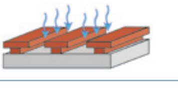
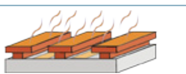
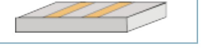
Etch process: The protective layer is not attacked over hours.

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

Protective Coating SX AR-PC 5000/41

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.

Process step	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.

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