ALLRESIST

Innovation
Creativity
Customer-specific solutions

New: Protective Coating AR-PC 5094.02

Conductive protective coating for polymer and novolac-based resists

Top layer for the dissipation of e-beam charges on insulating substrates

Characterisation

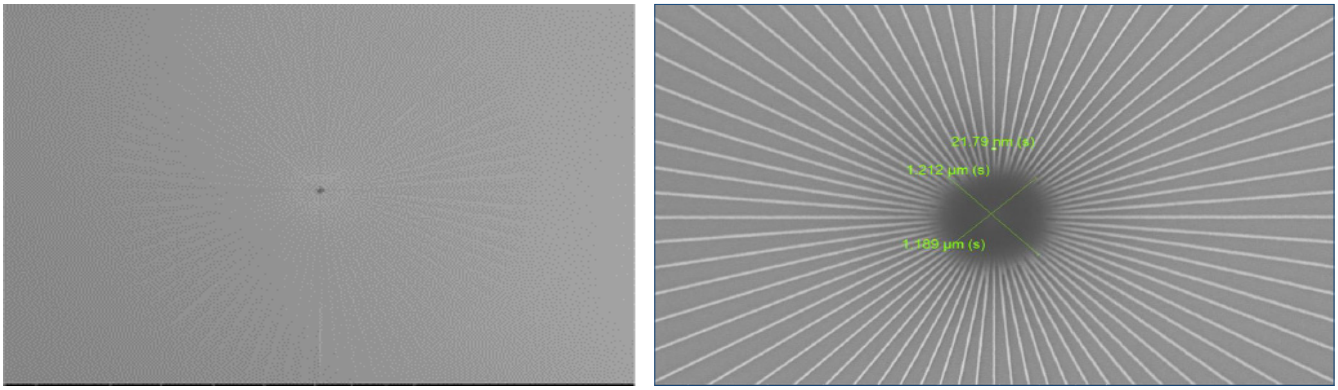
- as protective coating, this resist is not sensitive to light / radiation
- thin, conductive layers for the dissipation of charges during electron exposure
- for coating on all AR e-beam resists, e.g. CSAR 62, Medusa 84 SiH, except CAR resists
- Improved properties compared to AR-PC 5092.02
- easy removal with water after exposure
- polyaniline-derivative dissolved in water

Properties I

Parameter / AR-PC	5094.02
Solids content (%)	2
Viscosity 25°C (mPas)	1
Film thickness/4000 rpm (nm)	42
Film thickness/1000 rpm (nm)	100
Resolution (µm) / Contrast	-
Storage temperature (°C)*	8-12

* Products have a guaranteed shelf life of 6 months from the date of sale if stored correctly and can also be used without guarantee until the date

Properties II



Siemens star written on quartz with the new conductive coating Electra 92 (AR-PC 5094.02) spun on to prevent charge build-up. This variant of Electra 92, specially developed for Medusa 84 SiH, has excellent coating and adhesion properties.
B. Drent, AMOLF NanoLab Amsterdam

Conductivity

Conductivity in layer, 60 nm (S/m)	1.2

Process parameters

Substrate	4“ wafer quartz with AR-P 662.04
Coating	2000 rpm, 60 nm
Soft bake	85 °C

Process chemicals

Adhesion promoter	-
Developer	-
Thinner	-
Remover	DI-water

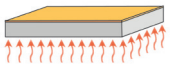
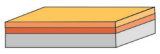
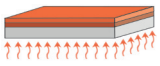
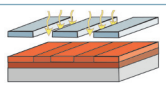
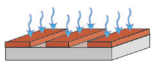
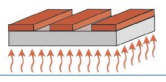
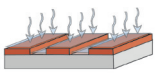
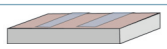
ALLRESIST

Innovation
Creativity
Customer-specific solutions

New: Protective Coating AR-PC 5094.02

Process conditions

This diagram shows exemplary process steps for resist Electra 92 - AR-PC 5094.02 and PMMA-resist AR-P 662.04. All specifications are guideline values which have to be adapted to own specific conditions.

1. Coating 	AR-P 662.04 on insulating substrates (quartz, glass, GaAs) 4000 rpm, 60 s, 140 nm
1. Soft bake (± 1 °C) 	150 °C, 2 min hot plate or 150 °C, 30 min convection oven
2. Coating 	AR-PC 5094.02 2000 rpm, 60 s , 60 nm
2. Tempering (± 1 °C) 	90 °C, 2 min hot plate or 85 °C, 25 min convection oven
E-beam exposure 	ZBA 21, 20 kV Exposure dose (E_0): 110 µC/cm^2 (AR-P 662.04, 140 nm)
Removal 	AR-PC 5094.02 DI-water, 60 s
Development (21-23 °C ± 0.5 °C) puddle  Stop	AR-P 662.04 AR 600-56, 2 min AR 600-60, 30 s
Post-bake (optional) 	130 °C, 1 min hot plate or 130 °C, 25 min convection oven for slightly enhanced plasma etching stability
Customer-specific technologies 	Generation of e.g. semi-conductor properties, etching, sputtering
Removal 	AR 600-71 or O_2 plasma ashing

Processing instructions

The conductivity may be varied by adjusting the thickness with different rotational speeds. Thicker layers of 90 nm thus have a 2.5 times higher conductivity as compared to 60 nm thick layers.

For the build-up of an even conductive layer, the substrate should be wetted with the resist solution before the spin process is started.