EOS 72 – Chemically amplified resist with outstanding alkali stability

Mandy Grube [a], Maik Gerngroß [a], Harry Biller [a], Matthias Schirmer [a], Judith K. Hohmann [b]

[a] ALLRESIST GmbH, Am Biotop 14, Strausberg, D-15344, Germany
[b] Institute of Microstructure Technology (IMT), Karlsruhe Institute of Technology (KIT), Hermann-von-Helmholtz-Platz 1, Eggenstein-Leopoldshafen, D-76344, Germany

E-mail: mandy.grube@allresist.de

We are working at full speed on the development of a positive, highly sensitive CAR E-Beam resist EOS 72, as an alternative to the FEP 171. The FEP series products are suitable for a wide range of applications requiring positive tone electron beam exposure. The photo mask industry accepted the high activation energy type CAR, FEP171 as a standard positive CAR resist for 130nm-100nm node technology.

The target for our FEP 171 alternative, EOS 72, is to generate 100 nm structures at a sensitivity of 10 µC/cm². Furthermore, we want to develop a variant that can be processed by e-beam as well as by photolithography. The main focus of this new product development is the particularly a high alkali stability.

EOS 72 is based on a copolymer, various acid generators and a base as quencher, dissolved in methoxy propyl acetate. The working dose for the e-beam application is currently about 20 µC/cm² and for photolithography about 30-45 mJ/cm^2 in a wavelength range of 365-405 nm.

We have already been able to prove the high alkali stability with the first prototypes. For example, we use a 25% TMAH solution for the development of our EOS 72. Due to the high alkali stability, we also see the possibility of generating etching structures in silicon. Further process parameters, such as the required post exposure bake, are currently being optimised.