



# AR NEWS

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Welcome to the 47th issue of our AR NEWS.

Meanwhile, the corona pandemic is no longer imposing restrictions on us, but still the inhuman and terrible war triggered by Putin in Ukraine overshadows our lives. Let us just hope that this war can soon be ended for the benefit of Ukraine and Europe.

Despite all that what troubles us, we would like to inform you again about the further development of our company and its research projects.

### **1. On February 20, Allresist received an important IHK certificate for exemplary CO<sub>2</sub> balance in determining their carbon footprint on the path to climate neutrality**



Fig. 1 IHK General Manager Gundolf Schülke (right), presenting Allresist with the certificate for the CO<sub>2</sub> footprint

In the summer of 2022, Allresist was selected by the Ostbrandenburg Chamber of Industry and Commerce (IHK) along with four other pilot companies to create a CO<sub>2</sub> balance. The Future Living INT GmbH accompanied Allresist in the carbon footprint assessment on the initiative of the IHK Ostbrandenburg.

For this purpose, Allresist determined both direct and indirect CO<sub>2</sub> emissions which were then divided into scopes 1-3 according to the Greenhouse Gas Protocol (GHG) and are thus internationally comparable.

Allresist has determined its emission values using specific key figures. The result is a comprehensive and extremely positive assessment of the company's most important activities.

In its pioneering role, Allresist has gained further insights and is now able to support other companies in the region on their way to climate neutrality with its knowledge. In addition to the many measures that have been beneficial to our climate for over 20 years to reduce emissions and save valuable resources, Allresist can also report further successes in 2023:

Compared to 2021, Allresist consumed in 2022 20% less electricity and 23% less heat with special measures. Combined with the photovoltaic system, we thus avoided 44% = 9.8 t CO<sub>2</sub>. This resulted, together with the green electricity share purchased from the municipal utility company, in a minimal carbon footprint.

A cherished (even though still rather new) tradition is our annual tree-planting day with the entire Allresist team in the forest near Gottesgabe in the Märkisch Oderland district. Since 2021, we have been supporting the local forester with generous donations which he uses to buy hundreds of seedlings that we all

plant together. This physically demanding day leaves a very satisfying feeling for everyone involved and makes us eager for repetitions in the future.



Fig. 2 Allresist team taking a break in the forest near Gottesgabe

## 2. Allresist awarded as “Employer of the Future” on March 15



Fig. 3 Employer of the Future seal

The German Institute for Sustainability and Digitalization (DIND) supports companies in becoming fit for the future. For this, the DIND cooperates with experts from business, science, and politics, conducts studies on behalf of partners, and checks companies for their future viability. The patron of this initiative is Brigitte Zypries, former Federal Minister for Economic Affairs. Allresist was asked about the following topics by the DIND and scored very high with 96 %:

- Strategy within the evolving market environment, with proactive planning and management of change
- Digitalisation as an opportunity for the future
- Customer orientation: assessment of service quality according to "The customer is king"
- Personnel: organisation - motivation - qualification - well-being
- Sustainability: stepwise improvement of processes and services

However, our brand`s core statements also impressed the German Institute of Sustainability and Digitalization:

- Corporate mission statement with a clear sustainable vision, mission and a customer-oriented, market-based and growing business model.
- Highest competence, creativity and innovation power for individual consulting to achieve optimal products from a large portfolio of highest quality as well as tailor-made customer solutions.
- Lived sustainable human and solidarity values in an independent and self-sustaining family business: renunciation of profit maximization at any price, doing meaningful work instead of just accumulating profit, feeling committed to society and the environment, thus being a source of inspiration and role model for other companies. This includes involving all employees and taking them along on the journey.

## 3. EOS 72: Our new, highly sensitive and alkali-resistant e-beam resist

To complete our product portfolio, we have developed the positive E-beam resist AR-P 7200 (EOS 72) which works on the principle of chemical amplification and has high sensitivity. The structures in Figure 4 were written with a dose of 35  $\mu\text{C}/\text{cm}^2$  at an acceleration voltage of 50 kV.

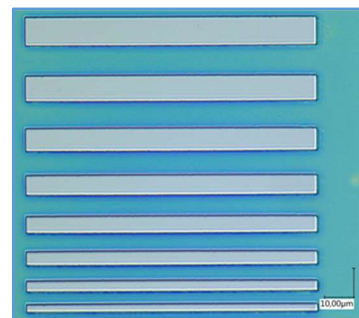


Fig. 4 EOS 72 resist structures

Remarkable in these experiments was the contrast of more than 10.

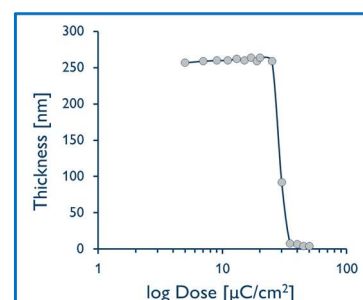


Fig. 5 Contrast curve of EOS 72

By optimizing source materials (acid generators and polymers) and process parameters, a dose to clear of  $10 \mu\text{C}/\text{cm}^2$  could now be achieved.

EOS 72 is characterised by high alkali stability; even concentrated TMAH solutions cannot dissolve the structures which makes the resist suitable for alkaline etching processes. This feature gave us the idea to design a photoresist for such etching processes. Using an acid generator with an absorption  $> 300 \text{ nm}$ , first samples were produced that could be patterned with an i-line mask aligner.

We will inform you as soon as the development work is completed.

#### 4. New ZIM project – Photoresists for concave and convex surfaces

In cooperation with the Westsächsische Hochschule Zwickau University of Applied Sciences and B&B Sachselektronik GmbH, Allresist started the project "Photoresists for concave and convex surfaces" on February 1, 2023. The aim of this project within the context of the Central Innovation Programme for small and medium-sized enterprises (ZIM) is to develop a method for photolithographic processing of uneven surfaces of microelectronic substrates (printed circuit boards, spherical bodies or topologically structured silicon chips) and the direct functionalisation of housings parts of machines, devices, smaller appliances and smart wearables (substrates) with microstructures. For this purpose, a novel resist coating process is being developed that is, in contrast to classical spin coating, not only suitable for flat substrates. In this innovative coating process, a resist that is specifically modified for this application and exactly weighed out is dropped onto a water surface and spreads to a defined thickness. The spherical substrate underneath the floating resist layer in the water (see Fig. 6) is then carefully lifted. The layer adheres to the curved surface and can then be exposed and developed in subsequent steps (see Fig. 7).

Thus for the first time, concave and convex surfaces can be coated. In combination with a high coating speed and possible scalability in terms of substrate area and quantity, new possibilities arise for direct assembly and functionalisation of housings and structure-giving elements of devices of various sizes and types.

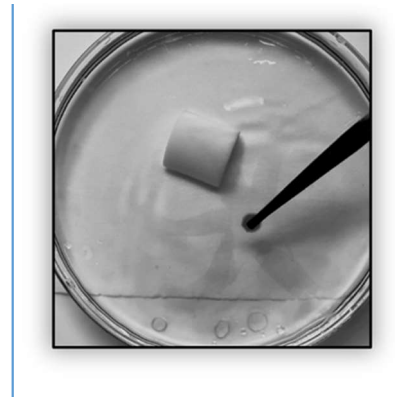


Fig. 6 The spherical substrate to be coated under the floating resist layer



Fig. 7 The substrate after exposure and development

If we have aroused your interest, we would be happy to provide you with further information.

#### 5. Allresist represented again at the EIPBN and MNE congresses

Finally face-to-face conferences are back again – and Allresist will be present both at the EIPBN in San Francisco and the MNE in Berlin. Both places could hardly be more different, San Francisco is halfway around the world, Berlin right on our doorstep. The focus of the EIPBN from May 30th to June 2nd in San Francisco traditionally lies on electron beam lithography. Taking this into account, we present further results of our EOS 72 (sensitive, chemically amplified positive e-beam resist) in a poster. New applications for our globally established electron beam resists CSAR 62, Electra 92, Phoenix 81, and Medusa 82 will also be shown.

We will see many familiar faces from the community and, despite the long flights, invite all interested parties to visit our booth.

We would be happy to send you a summary of the news as well.

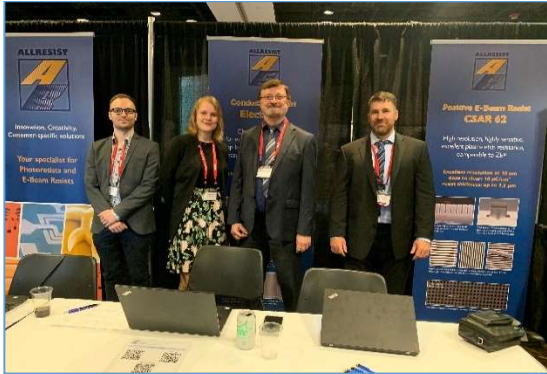


Fig. 8 Allresist at the EIPBN 2022 in New Orleans, USA

The second conference is the MNE 2023 in Berlin from September 25th to 28<sup>th</sup>, and we have already reserved a booth here as well. In addition to our standard photoresists, we will also present many innovations like e.g. coloured resists, resists with higher plasma etch stability, and, brand new, also materials for waveguides. This material can be structured in a water-free way and is thus suitable for water-sensitive applications.

In terms of travel, Berlin is much more affordable for Germans and Europeans, so maybe you are interested? We look forward to your visit!

We hope that you've found some interesting news and suggestions and welcome your opinion. The next issue of the AR NEWS will again be presented in October 2023. Until then, we wish you and ourselves much success. 😊



Strausberg, 25.04.2023

Matthias & Brigitte Schirmer in the Team: 30 years of Allresist

