



NEXTUP EXPERT INTERVIEW



An interview with **Dr. Thomas Büsgen**, Head of Automated Laboratory Coatings & Adhesives, Covestro

Accelerating product innovation with data-driven insights

Coatings and adhesive manufacturers must stay agile in today's market. Dr. Thomas Büsgen discusses how his team's new laboratory aids manufacturers in delivering more circular, customized, and high-performance solutions.

Explore how the Covestro Automated Laboratory enhances product development.

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Question 1:

How do you think the Automated Laboratory will change product development in the future?

Coatings manufacturers must keep pace with evolving market demands. Customers increasingly seek high-performance, cost-efficient, customizable, and more sustainable solutions, and they expect manufacturers to respond quickly to their needs.

From a product development perspective, this requires speed without compromising the accuracy or effectiveness of research and development activities. In practical terms, coatings and adhesives innovators like Covestro must be able to evaluate a broader range of potential binder and crosslinker formulations.

Relying on traditional manual methods would be inefficient, prone to error, and time-consuming. However, with the Automated Laboratory, we can utilize digital tools to conduct broad screenings and make optimizations that precisely match customer needs. Plus, we can perform these operations 24/7 since the robotic system can run autonomously at night and during the weekends.

The high-throughput Automated Laboratory is specifically designed for coatings and adhesives innovation. It features a transport mechanism that moves vessels and substrates seamlessly from one module to another for tasks such as automated formulation preparation, liquid analysis as well as application and film characterization.

These advanced capabilities enable the Automated Laboratory to accelerate product development while continuously improving accuracy and precision. Each series of experiments generates a large volume of data, which our calculation services analyze and pass on to our experts for further analysis and visualization. Additionally, machine learning solutions help our experts to identify optimal formulations that meet specific properties.

This not only speeds up product development but also allows us to explore raw material combinations that can enhance sustainability and address highly specialized customer needs.



By combining human expertise with digital technologies, the Covestro Automated Laboratory opens up new opportunities for the future of coatings and adhesives.



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Question 2:

Why is the Automated Laboratory important for developing more sustainable solutions?

Creating more sustainable solutions is a complex process that goes beyond making minor changes to existing products. When incorporating bio-based building blocks in the synthesis of our resins and cross-linkers, a direct one-to-one replacement of fossil-based building blocks is not always possible. Instead, we adapt our partly bio-based products to match the properties and performance of their conventional alternatives to provide ease of use for our customer base.

Successfully making these product adjustments requires precise modifications. The Automated Laboratory allows us to analyze data at a highly detailed level, helping our experts identify the optimal combinations of raw materials.

Furthermore, we can also help our customers to integrate more sustainable raw materials into their own formulations without compromising performance, quality, or versatility. With the Automated Laboratory, which is custom-made for these workflows, we see a huge opportunity to help customers improve their environmental impact. For example, we have already made some significant advances in expanding our portfolio of more sustainable crosslinkers for the **Desmodur**[®] CQ ultra N product line. These types of aliphatic crosslinkers can be used in a wide variety of applications, including in clearcoats in the automotive refinishing market.

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Question 3:

How do you combine the possibilities of artificial and human intelligence?

Artificial intelligence, machine learning, and automation can accelerate product development. They are an ideal augmentation of human capabilities, primarily because they provide our experts with easy and efficient access to large data sets.

Unlike our experts, digital tools cannot interact with customers to understand their unique requirements, nor do they instinctively know where to start when developing a new product or refining an existing formulation.

Digital solutions like design of experiments, calculation services, machine learning, and AI only help our experts to set up and interpret large test series; every process and every experiment is human led. By working in this way, we get the best of both worlds: human knowledge developed over decades combined with highly efficient digital tools.

Most of all, when we do use cutting-edge tools like AI, we ensure that these solutions are explainable at every step. This enables our experts to verify accuracy and ensure that digital solutions truly help us create the products our customers need.

Key drivers in digitalized product development



Hover over the boxes below to read more:



Interested in learning more?

Contact Thomas and our other Automated Laboratory experts.



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¹ Please see the "Guidance on Use of Covestro Products in a Medical Application" document.

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