Digital design development of interior car parts

**Covestro simulations help optimize polyurethane foaming processes**

**Example instrument panel: shorten development cycles, reduce complexity and costs**

The heart of automotive development – the design phase – is becoming increasingly digital. Automotive manufacturers and direct suppliers in particular often ask for digital verification for specific components, from instrument panels to interior trim. The focus is on simulation calculations that shorten development cycles, reduce complexity and costs, and mitigate risks. [Covestro](https://www.covestro.com) has worked intensively on the simulation of the polyurethane (PU) foaming process and has developed material models and state-of-the-art calculation methods for this purpose, as well as building up powerful computing capacities. To this end, the company will present its current developments at the world’s largest plastics trade show, [K 2022](https://www.solutions.covestro.com/en/digital-event-space/kfair) in Düsseldorf.

Product and process design is heavily dependent on the engineer’s experience with customers. Trial and error in setting up the final process is time consuming and costly. That is why simulations have played an important role in the planning of new products for quite some time. In car interiors, however, it has long been a question not only of simulating structure and form, but of creating a digital twin of the possible manufacturing process. To this end, those involved are relying on the science of materials modeling to simulate the foaming process.

This can be explained using the example of an [instrument panel](https://www.solutions.covestro.com/en/highlights/articles/stories/2022/instrument-panel-foaming-simulation). In this application, semi-rigid PU foams based on Bayfill® have become well established, as they enable the economical and reliable production of components with complex contours. In addition, the foams provide a pleasant feel and noise insulation.

"Thanks to Covestro's digital twin for Bayfill® foams, suppliers and automotive manufacturers receive detailed information about the processing behavior of the material as early as the design phase, before real experiments or trials are necessary," says Dagmar Ulbrich, Head of Automotive Systems R&D at Covestro. "This helps identify potential challenges early on, when product and tooling changes can still be made at low cost."

Polyurethane foams can meet the requirements for instrument panels and other interior parts well, but the foam must be processed within a specific process window. Simulated foaming based on Covestro’s material models helps to optimally adjust the process window.

**About Covestro:**

Covestro is one of the world’s leading manufacturers of high-quality polymer materials and their components. With its innovative products, processes and methods, the company helps enhance sustainability and the quality of life in many areas. Covestro supplies customers around the world in key industries such as mobility, building and living, as well as the electrical and electronics sector. In addition, polymers from Covestro are also used in sectors such as sports and leisure, cosmetics and health, as well as in the chemical industry itself.

The company is committed to becoming fully circular and aims to become climate neutral by 2035 (scope 1 and 2). Covestro generated sales of around EUR 15.9 billion in fiscal 2021. At the end of 2021, the company had 50 production sites worldwide and employed approximately 17,900 people (calculated as full-time equivalents).

**Forward-looking statements**

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