

New cleanroom production solution by ENGEL goes live

SPE Grand Award honours innovative application on the vehicle exterior

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The BMW Group has launched a new ENGEL production unit at its Landshut production plant. The kidney-shaped badge for the electric BMW iX is produced in a cleanroom atmosphere. Both the BMW Group and ENGEL are breaking completely new ground here, prompting the International Society for Plastics Technology (SPE Central Europe) to honour the application with the SPE Grand Award 2021.

Once the radiator grille, this characteristic design feature of all BMW models has taken on a new role following electrification of the drivetrains. The kidney-shaped badge protects the camera as well as several sensors for assisted and, in future, autonomous driving. The new function means that both the design and the manufacturing process for the kidney-shaped badge has changed fundamentally.

In an integrated process, a heatable functional film is back-moulded with polycarbonate and flood-coated with polyurethane. This is a combination of processes which is also offered by ENGEL under the name clearmelt. "We knew from the start that this process combination would enable automotive designers to think in a completely new way," says Michael Fischer, Head of Business Development Technologies at ENGEL AUSTRIA. "With the technology already having been used for vehicle interiors, the kidney-shaped badges for BMW's new electric models represent the next step. This is the first time that combined film back injection moulding and polyurethane flooding is being used in the series production of functional components on the exterior, where they are exposed to particularly high stress."

The sensitive electronics are well protected under the scratch-resistant polyurethane surface. The high gloss level and depth effect, which even a thin coating of polyurethane achieves, convey a very elegant impression.

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Processing three materials in a single step

ENGEL is system supplier for this demanding project, with responsibility for the complete production cell. In terms of process integration and automation, it meets particularly high requirements.

The production cell integrates an ENGEL duo combi M injection moulding machine with a horizontal rotary table, two large articulated robots for handling the films and moulded parts, a film cleaning system, an inline quality-control station and peripheral units including polyurethane technology. The injection moulding machine's clamping unit and the robot work areas are encapsulated over a length of six metres and a height of more than four metres to achieve an ISO class 7 cleanroom. The special feature: Above the injection moulding machine, the cleanroom has a sliding ceiling which can be opened for mould changes and other work in the mould area. All work steps in the cleanroom are automated. The robots also unpack the function films and pack the parts.

An ISO class 8 greyroom adjoins the cleanroom with the production cell. This is the work area for the production employees who transfer the airtight boxes with the function films to the cleanroom production system and the packed moulded parts to intralogistics for downstream processing.

Virtual reality ensures future-proof investment

Another first: ENGEL virtually visualised the entire production unit as early as in the RFQ phase. "In the 3D simulation, we were able to guide our customer through all the production cell areas, see how the robots interact, and assess the ergonomic aspects before construction of the cell had even begun," as Walter Aumayr, Vice President Automation and Peripheral Units at ENGEL AUSTRIA reports. "This is the future. Virtual reality means that we can give our customers even better investment security."

As the system solution provider, ENGEL is the central contact for customers, also for system components realised in conjunction with partners. Partner companies for the production cell for the BMW's new kidney-shaped badges include Hennecke from St. Augustin, Germany, for polyurethane processing, and Petek Reinraumtechnik from Radolfzell, Germany, for cleanroom technology.



The kidney-shaped badges for the new BMW iX are produced in a highly integrated cleanroom production cell by ENGEL. This is the first series production application for combined film back injection moulding and polyurethane flooding on the demanding vehicle exterior.

Picture: BMW Group

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ENGEL is one of the global leaders in the manufacture of plastics processing machines. Today, the ENGEL Group offers a full range of technology modules for plastics processing as a single source supplier: injection moulding machines for thermoplastics and elastomers together with automation, with individual components also being competitive and successful in the market. With nine production plants in Europe, North America and Asia (China and Korea), and subsidiaries and representatives in more than 85 countries, ENGEL offers its customers the excellent global support they need to compete and succeed with new technologies and leading-edge production systems.

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