

Automated pool painting

New painting robot for large area coating of GRP

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Recently, the swimming pool manufacturer Polyfaser from Prad, South Tyrol, has invested in a new automated painting system including an individualised painting robot. At the beginning of 2020, after a planning process of about a year, the newly designed system went into operation.

The production of the pools is basically a manual process in which negative moulds are gel coated in a manual spraying process. So far, this exhausting manual spraying process has been carried out by two employees. Human factors such as fatigue and concentration often had to be considered. However, as the requirements for evenness in this step are very high, Polyfaser decided to invest in an automated solution. "During the restructuring process, it was our aim not to pull out the roots, but to keep up with the time," emphasises Patrick Wagmeister, who is responsible for Purchasing & Human Resources at Polyfaser. In order to implement the project, Polyfaser decided in favour of Wolfangel GmbH from Ditzingen, who brought the robotics partner CMA on board.

"The aim of the project was to achieve an even and good surface quality which is reproducible," says Andreas Doll, Managing Director of Wolfangel GmbH, who has accompanied the project from the beginning. "The pools to be coated have dimensions to the extent of 12 x 4 m, so that one of the challenges of the project was to reach all sides and final points with only one robot if possible". Further general requirements resulted from the available space: The single-storey old plant was replaced by a two-storey new installation. Only the extraction system remained. The spraying system is installed in the lower area, while the control system of the robot and the sensor system of the spraying machines are on the upper floor. The walls of the new installation are made of Plexiglas, so that you can see into the hall from everywhere.

Before coating, the movably stored pool moulds are cleaned. Then a forklift transports the large moulds into the spraying booth. There is a rail with two different stops to position the zero point for the robot. Due to the special size challenge, Polyfaser uses the CMA robot "GR6100" with a hollow wrist, which is mounted in a hanging position on a linear axis. It offers several special features, for example it has a special mechanism for better accessibility in the upper part of the moulds and an extreme operating range of 3600 mm. This enables the robot to completely remove large workpieces in a suspended

position and apply the gel coat. The initial programming of the robots was carried out by CMA for each workpiece. After a training course in robot programming, employees of Polyfaser will implement the remaining approx. 30 workpieces and prospective new projects independently. For this purpose, offline programming software by CMA is used, so that the programs can already be prepared in the office outside the line.

The spraying technology used in the manufacturing process was individually adapted to the robot operation during modernisation by Wolfangel. Sensors monitor the material flow, which can be heated if required. This ensures a consistent material temperature regardless of the season. Finally, this enables a consistent viscosity and thus a continuously high spraying quality.

During the spraying process the polyester gel coats are not applied to work pieces but to negative moulds. A total of five colours are available here. The application is carried out in at least two cross-sprayed layers, generating a layer thickness of between 0.6 and 0.8 mm. After the coating is finished, it hardens at room temperature. Then the employees of Polyfaser apply laminate. The final production step is the application of a topcoat - afterwards, you can take a bath.

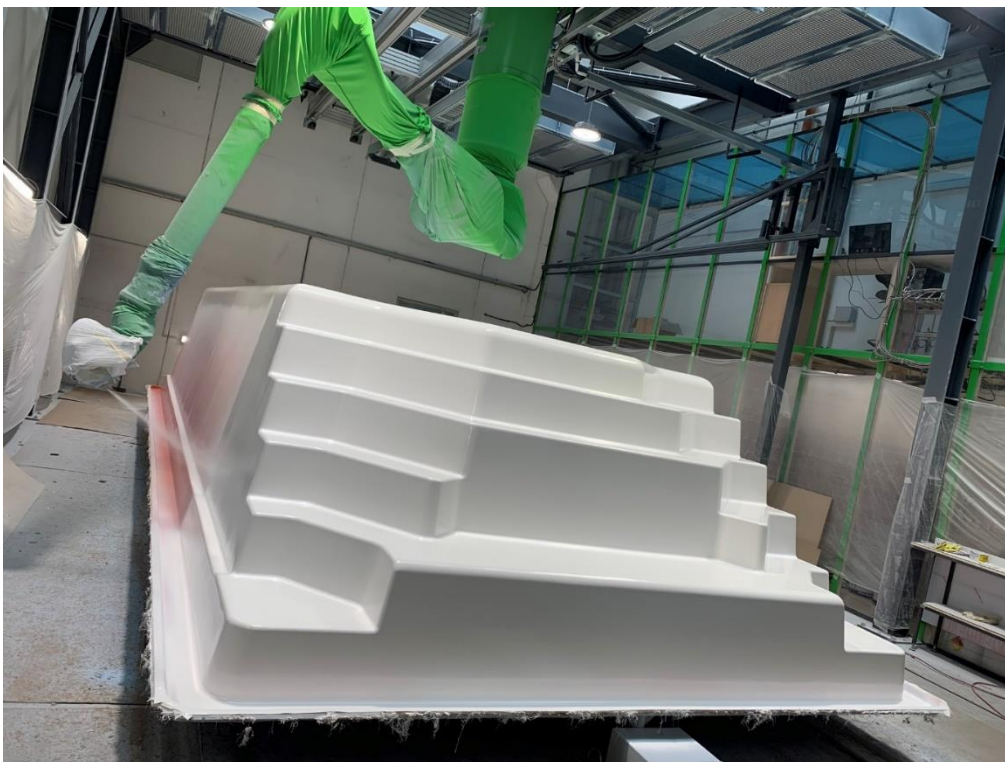
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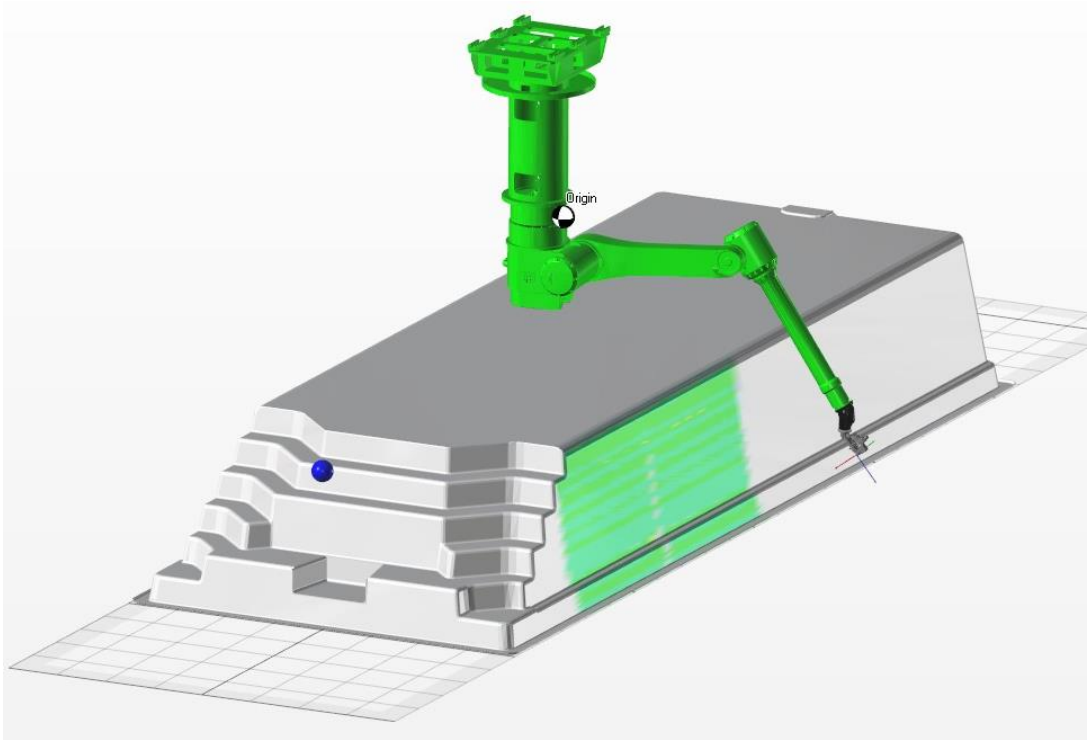
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The robot can coat the complete component while hanging. Photos: Wolfangel/CMA



Even individual shapes are no problem for the robot which is easy to program.



A 3D model of the workpiece can be loaded into the offline system, and the points for the movement of the robot can be set on the surface. Graphic: CMA