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Midas Pattern and Design Edge Deliver Eye-catching Design for Renishaw

The Renishaw incise[™] dental scanner is used by dental laboratories in the manufacturing of dental crowns and bridges, work that has to be highly accurate to ensure a perfect fit and comfort for patients.

When Renishaw designed the popular incise[™] dental scanner, the company chose precision toolmaker Midas to help create a moulding to produce a casing with an eye-catching design.

Duncan Searle, senior design engineer at Renishaw, explains the reasons behind the design: "Earlier dental scanners were manufactured in sheet metal, but we were concerned about the accuracy and the quality of the finish. We needed a casing that offered an attractive cosmetic appearance and good design integrity."

For Renishaw, the new casing had to deliver significant improvements in terms of the look and fit compared with previous versions, but the company also had to balance the quality of the finished component with affordable manufacturing costs.

"We concluded that polyurethane would be the ideal material to use for the new casing," Searle says. "Compared with vacuum forming, we felt the repeatability and accuracy of polyurethane moulding would be best."

Searle continues: "The volumes we anticipate making meant that polyurethane moulding was more cost-effective than injection moulding. However, beyond that decision, the design process began with a more or less blank sheet."

Gloucestershire-based Renishaw had worked previously with Midas, located in Bedford, on the production of some of its other high tech instruments and laboratory equipment, so the toolmaker was a natural starting point for the design process. Renishaw also enlisted the support of Design Edge, an industrial design agency in Cambridge. A challenging timeframe was set for the project.

"The project began at the start of January," Searle explains, "but we had a fairly short turnaround because we wanted to get the project into the marketplace by the summer."

Midas and Design Edge worked closely on the project, with the design agency's knowledge of the capabilities of the manufacturing method and material ensuring that the process moved smoothly. Because the casing had to accommodate the existing scanner, meeting exact tolerances was vital. Once the design was completed it was Midas' job to convert it into a physical product.

Searle says: "Design Edge had the finished fully detailed design in a CAD system. Midas had to

take that data and convert it into a tooling design and create the mould to produce the final component.”

For Renishaw it was important that the scanner stood out, not just in terms of being a sophisticated unit with an excellent finish, but also in the way that it looked. Perhaps one of the most challenging aspects of the entire project for Midas was to manage tooling so that the finished mouldings, particularly around the ‘shut line,’ could match the high expectations created by Design Edge’s attention-grabbing product design.

Searle explains: “The appearance had to be really high quality, so the product scanner is fully enclosed by the moulding. The design includes many curves and this meant that Midas had to manage the split line, where the two parts of the moulding come together, very carefully. They had to ensure the “shut line” was perfect to maintain the quality appearance.”

The “shut line” runs along one of the scanner’s curves with a 2mm gap running its entire length, requiring pinpoint accuracy. At the tooling stage of any project there is often the need for significant design changes. Despite its complexity, this was not the case for the scanner. Searle says: “There was very little need for tweaking, just some minor development areas that required easy tooling modifications.”

Once the mould had been completed, Searle and his colleagues from Renishaw joined the Design Edge team to see the first finished components, completed right on schedule by Midas.

Everybody was delighted with the results. “The first set of manufactured mouldings fitted perfectly first time, just as we had expected,” Searle says. “The surface finish of the component was also excellent, which in turn meant the quality of the paintwork was what we were hoping for. In fact, the entire project was absolutely spot on and the relationship with Midas and the design company was extremely easy.”

As a result of the hard work by all those involved, Renishaw’s new incise[™] dental scanner is a stylish and sophisticated unit that stands out in the marketplace.

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