

PS Dentallabor Linz Takes Customized Dental Appliances to the Next Level with Ultra-Realistic J5 DentaJet 3D Printers

Founded more than 20 years ago, PS Dentallabor Linz is a leading expert in dental appliance production in Linz, Austria. With a team of 11 dental specialists, the lab specializes in creating highly customized dental splints, drilling guides, dental models and prosthetics. To respond to collaborative feedback from dentists and dental laboratories, PS Dentallabor Linz invested in new digital equipment and technologies in 2016, including 3D printing.

Over the past several years, PS Dentallabor Linz has become an expert in 3D printing for dental appliances but lacked the layer accuracy and full-color print capabilities needed to support its growing custom dental appliance portfolio. Looking to add ultra-realistic color and material capabilities to its technology portfolio for customized dental appliances, PS Dental Linz CEO Mst Daniel Plchot, and Co-CEO Mst Oliver Bläsius invested in two Stratasys J5 DentaJet 3D printers.

“We develop a varied array of highly personalized dental appliances, from models that are used for educational purposes or surgery preparation to dental prosthetics,” says Plchot. “3D printing has played an important role for us, but we were nonetheless constrained by limitations of our existing solutions, which fell short when it came to the increasing demands from customers for realistic, customized, color models and access to a broad range of materials. We were also keen to update our own workflow, minimizing post-processing for dental appliances around 3D printing and allowing us to produce different parts on the same tray at the same time.

“The J5 DentaJet has opened up new possibilities for us — to the point where we can produce even the most complex parts, such as implantology drilling guides, which were impossible to produce before.”

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The J5 DentaJet has drastically accelerated our production of 3D printed parts. Previously, we 3D printed two to three parts in the same materials overnight on one build tray. Now, the optimized rotational build tray of the J5 printer allows us to produce as many as 30 models in the same print job overnight — even if those parts require different materials. This has been a game-changer in terms of the quantities of customized models we can now produce.”

Mst Daniel Plchot
CEO

Mst Oliver Bläsius
Co-CEO



Customization — Precision and Color Are Key

Most dental appliances produced by the PS Dentallabor Linz lab are created based on patient-specific anatomy. With pressures to develop dental appliances that need little to no post-processing and immediately have the right fit, Bläsius and his team needed an accurate and repeatable solution.

“The precision of the J5 DentaJet has been exceptional,” says Bläsius. “Other 3D printers we investigated presented limitations in layer quality, only achieving layers of 50µm. However, the J5 DentaJet ticks another very important box in enabling us to reach 19µm. This means we can 3D print repeatable dental applications that mirror the patient’s anatomy exactly.”

Beyond precision, color has been a key driver to enable further customization of 3D printed models. The J5 DentaJet offers access to over 500,000 colors, which supports advanced crown and bridge production. For these models, coloration of the stumps in the front of the model can be color-matched precisely through the large color palette of the printer, enabling faster end results and the opportunity to perfect the design early in the development process.

Maximizing Throughput

With the J5 DentaJet’s ability to print up to five different materials at the same time, PS Dentallabor Linz can load mixed trays of several different applications into one print job, thereby boosting production capacities.

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Ramping up its production from just three to 30 3D printed models in the same timeframe has come alongside another advantage for PS Dentallabor: the reduction in workflow processes.



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“Our entire planning and production workflow has been shortened and simplified with the new Stratasys 3D printer,” says Plchot. “Previously, we invested a lot of time into planning 3D print jobs and prioritizing prints based on an ever-changing timeline. For certain 3D printers, we also had to work with liquids and needed to clean trays between use, as well as switch out materials for different print jobs. Now the process is completely streamlined; there is no longer a requirement to switch materials, which has significantly reduced the time and effort that goes into 3D printing our models.”

GrabCAD Print further streamlines operations. The lab uses the software alongside its J5 DentaJet to control and manage its print jobs. This enables a seamless digital workflow for PS Dentallabor Linz, as the software makes readying data for printing easy and accessible.



The precision of the J5 DentaJet has enabled PS Dentallabor Linz to achieve layer quality of up to 19µm, compared to previous technologies which only achieved layers of 50µm — resulting in repeatable dental applications that mirror the patient's anatomy exactly.

Future Goals: 3D Printed Prosthetics

Looking ahead, PS Dentallabor Linz intends to strengthen its service offering by utilizing Stratasys PolyJet technology to produce dentures and prosthetics for its customers. Plchot, Bläsius and the team at PS Dentallabor are particularly looking at the technology's ultra-realistic color capabilities and selection of biocompatible materials to support this venture.

“We immediately recognized the capabilities of the J5 DentaJet and are particularly excited to expand the use of PolyJet 3D printing technology into prosthetics,” says Bläsius. “We are still in the initial stages, but we can see that the ultra-realism in terms of color and materials required for dental prosthetics is achievable with the J5 DentaJet. We anticipate this leading to business growth for us, which we would expect to support by adding further J5 DentaJet printers to our fleet.”

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