Dental laboratories have adopted 3-D printing to increase production efficiency and precision in the manufacture of a broad range of dental and orthodontic appliances. The introduction of 3-D printing to the digital workflow speeds up lead time for the benefit of practices, laboratories and patients. Dental Tribune spoke to Darrin Dickinson, Sales Manager at EnvisionTEC, about CAD/CAM systems and 3-D printing, which are changing the dental industry at a very fast rate.

Dental Tribune: 3-D printing is a reasonably recent technology in dentistry, and it offers a quick process with great accuracy and precision. Why is 3-D printing a superior solution for many clinics and laboratories?

Darrin Dickinson: At EnvisionTEC, we have ensured that 3-D printing for the dental industry has become an easy-to-use, highly accurate and economical process. Our machines are part of the workflow. First, the dentist scans the patient's mouth to quickly and comfortably obtain precision data for the dental laboratory, or takes and scans a conventional impression at a high resolution to produce digital data. The data is then analysed using dental software from 3Shape. Dental Wings or Exocad, or many others, and a tailored solution is developed for the patient.

Dental laboratories need simple CAD software to design restorations and models, and we give them the choice to work with whatever input devices and software they already use; they just continue to work with the same solution. We have ensured compatibility and a smooth workflow with the software from all of these providers. By installing the software and testing with our own dental technicians in our factory in Germany, we use these different packages to ensure seamless compatibility.

By ensuring we have the correct parameters, we have made sure that everythings passes through quickly. The laboratory can immediately and seamlessly use the data to begin production of the necessary components for the case. Multiple workpieces can be produced simultaneously, allowing laboratories to fulfill their customer requirements with consistent quality.

Our user-friendly 3-D printers produce highly accurate dental models within minutes based on the data. Another great advantage is the wide variety of materials that can be used for a broad spectrum of dental applications. Our new machines, the Perfactory Vida series, are capable of printing orthodontic models, partials, surgical guides and bite guards.

Another advantage is the easy change from one material to another with no waste, as our machines do not use any print heads or tubing that must be flushed or purged. Our materials come with a radio-frequency identification (RFID) tag, which communicates the correct specifications to the machine. It ties into our systems and provides the end-to-end calibration. If there is any issue, we can track the problem based on the RFID tag and other information stored within the machine. EnvisionTEC helps its customers be productive instead of spending too much time on learning and problem-solving.

EnvisionTEC has production facilities in the US and Germany. Many people might not know that your company explores the complete range of vertical sectors within some sections of the dental market. People invested in milling quite quickly and became familiar with the technology, but also spent a great deal of money acquiring it. Naturally, once one has invested the money, one does not all of a sudden stop milling and pursue printing instead. It will take time to see the investment in printers.

At the same time, 3-D printing has become increasingly efficient. We have been able to bring some of the technology down to a much more affordable price. A machine like the Perfactory Vida has a surprisingly lower cost than one would expect significantly. One flexible machine with easy-to-change materials now allows small or medium-sized dental laboratories to produce many workpieces within a short period. That is quite an advantage.

By working with STL files, EnvisionTEC has created a system that can print any model designed from an impression or intra-oral scan, and we are seeing the benefits of this approach. Distributors are offering our machines in complete packages with a scanner, software and a printer. Today, it is more about selling solutions and systems instead of single products.

“In the dental market, people tend to buy multiple milling machines.”

What materials do you recommend for use?

Our machines use our material. We do not provide machines that could just use anything. Customers know our reputation and quality. Low-quality materials would have a negative impact on this. Our printing materials are characterised by their strength and perfect fit. After all, the most important point for a dental laboratory is to be able to use the machine without having to first work out what materials and machines can be used.

Dental technicians should not be spending unproductive days or even weeks trying to establish exposure parameters, post-curing times and casting cycles. They are there to do productive, profitable work. Using machines and materials from different manufacturers would require expending a great deal of time and effort in determining the different parameters to ensure these function together. With EnvisionTEC systems, all of this work has been done, and we have thousands of successful customers worldwide benefiting from our years of developing complete solutions.

For example, at the Dentistry Show, we learnt from a competitor’s client that the company had spent €40,000 on a machine two years ago, but had not yet been able to start production. The machine was not able to manufacture the client’s dental parts, as the materials were not available and no software was initially not developed for it. After a while, the company established how the machine worked, but still needed the right software to print the dental parts. After buying the software, additional training was needed. They then discovered that the exposure parameters to expose the resin inside the machine were missing. They had no knowledge of what they needed to do, so the machine was still in a corner of their laboratory unused.

Our view is that our distributors and our dental experts should be there to do everything together with the customer. Once they have sold the machine, they are responsible for training and installation. When a client buys one of our machines, it has to be productive immediately; our machines are ready for use from day one.

Thank you very much for the interview.