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 iShape. 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 everything 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. What many people might not know is that your company explores the complete range of vertical sectors for 3-D printing and targets niche markets, such as hearing aids and jewellery. Why do you also continue to invest in the dental market?

The dental market is a growth opportunity for us because one of the things we have seen is that, although the adoption of milling happened very early on, the uptake of printing within the dental market has been rather slow. In the dental market, people tend to buy multiple milling machines. If one breaks, there is another one to fall back on. With printing equipment, it was not the price of one machine that was the issue: it was often the case that one would need at least two machines, requiring an investment of hundreds of thousands of euros. Luckily, this has changed and prices have come down 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.