Interview: 3D Printing – Sustainable additive innovations transforming the dental industry

By Rik Jacobs, The Netherlands

It was about 12 years ago that I first came into contact with additive manufacturing technology, also known as 3D printing. Back then it was still a new—and astonishing—technology, mostly being used in applications related to hearing aids I had been working in the dental industry for decades at this point, and it was clear to me that this technology should be adopted by the dental market. I became inspired.

This was also around the same time that “milling” technology became extremely popular in the dental industry, as well as in labs and clinics. This created an adopted market in terms of scanning and designing with software for dental applications. But, as I learned more about the additive dental technology, I knew that 3D printing stood to offer the added value of being more sustainable and productive technology that was also faster and more flexible.

I wondered whether or not I could succeed in 3D printing technology to the dental market. Could I be the first to do it by surfing on the “milling” wave and making use of the existing infrastructure which was more or less under implementation?

Along with my business partner, Mr. Connie Petgene, I set out to learn the details of all the different 3D printing technologies. We teamed up with TNO, the Netherlands Organization for Applied Scientific Research and started to formulate a wide range of materials, which we printed countless times, year after year, until we found what we were looking for. In 2011, we founded NextDent—a company that “the next big thing in dental”—in 2011, and introduced these materials to the worldwide dental market in 2013. The goal was to develop, register, and manufacture a wide range of printable dental materials for as many different dental applications as possible.

From 2014 to 2016, we built partnerships with many additive hardware manufacturers and dental software companies. We learned so much about the workflow—from the scan to the final printed object for placement in the patient’s mouth.

At last, we had a winning combination: with our peerless plug-and-play solution and the best possible training service and support, we were able to help even those from the vast majority of onlookers in this conservative professional market.

The milestones came in quick succession. First, we made national news on January 23, 2016, when Professor Dr. Daniel Wurzinger implanted a Micro Filled Hybrid (MFH) crown in my mouth that I myself had printed. Two months later, we were named the first company in the world to achieve Class 2 biocompatible certifications for crowns, bridge, denture and orthodontic applications. Ten months later, we were acquired by 3D Systems.

I knew by then there was a massive and urgent need for a high-speed 3D printers that could address a broad range of indications. These days, my vision is supported by the 3D printing market research firm SMART- ECH, who recently predicted that additive 3D printing will become the primary form of dental fabrication in both the laboratory and the clinical setting by 2024, and that 3D printing in dentistry will become a highly value-added process that will dominate many of the dental segments in which it already has a share today.

Temporary crowns and bridges are printable in MFH resins used by Digital Light Processing (DLP) printers today, and I truly believe that our current efforts to print long-term temporaries, dentures, try-ins, orthodontic retainers, splints, surgical guides and models will quickly prove successful and gain acceptance worldwide.

Based on the recently published analysis “3D Printing in Dentistry 2018” by SmartTech Publishing, it appears increasingly likely that the dental industry will transition to an all-additive—possibly even entirely additive—industry structure by 2027.

Our new additive solution powered by the Figure 4™ technology is leading this change by helping dental laboratories and clinics redefine their workflow and achieve improved accuracy (within ±0.5 mm), repeatability and productivity with a lower total cost of operation with the widest range of materials in the market.

When used in conjunction with 3D Systems’ robust portfolio of certified NextDent materials, dental labs and clinics can address the broadest range of indications from a single printer available today. This plug-and-play solution integrates with the dental industry’s state-of-the-art intra-oral scanning and software solutions, delivering a much more precise result than is available with manual production. The benefits of this revolutionary solution also extend to the patient, as it reduces both the time required to produce orthodontic and prosthetic devices and the number of office visits needed to complete treatment. This end-to-end solution combining materials, technology, software and services will help dental labs and clinics revolutionize their businesses.

This transformation has been 20 years in the making, but its time has come. And I couldn’t be more excited as it continues to unfold!