

## Achieving Better Control, Better Results in the Digital Workflow

Dr. Edward Lin of Orthodontic Specialists of Green Bay (OSGB) and Apple Creek Orthodontics of Appleton, Wis., is an early, discerning and passionate adopter of new technologies.

With digital dentistry moving so quickly, that's given Lin and his team at OSGB a leadership role in helping to refine a digital workflow that is dramatically improving the clinical experience for both patients and practitioners around the world.

Today, the tools that make up this workflow are increasingly mainstream, and Dr. Lin's experience shows just how much digital dentistry can transform a business.

"Our practice has been growing," Dr. Lin said. "3D printing is one of the big aspects there."

OSGB has four doctors — including Dr Lee Bialkowski, Dr Jim Tomassetti, and Dr Jay Frazier — and three locations: two in Green Bay and another in nearby Appleton. The team is continuously working toward an entirely digital practice because they believe it offers efficiency, clinical and customer-experience benefits.

For one, the digital future is increasingly free of gooey impressions that can make patients gag and vomit, and are time-consuming for dental teams to manage. But it also gives Dr. Lin better control of the appliances and tools he uses to deliver cost-effective results to his patients. In short, it's liberating.



*Dr. Edward Lin serves on boards for Sure Smile, American Orthodontics, the American Association of Orthodontics, OrthoTown and Orthodontic Practice. Today, when it comes to 3D printers, Lin said, "We only use EnvisionTEC."*

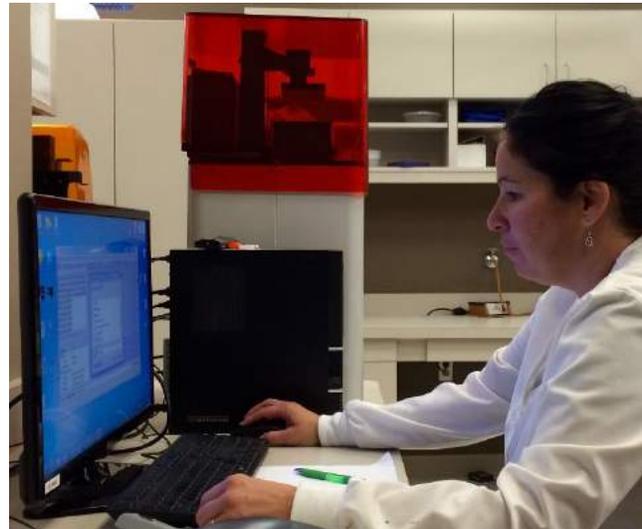
“We’re able to do things we weren’t able to think about doing a few years ago,” said Dr. Lin, who serves on a variety of boards with SureSmile, American Orthodontics, the American Association of Orthodontics Committee On Technology, Imaging Sciences, OrthoTown and Orthodontic Practice.

OSGB offers a full range of orthodontic treatments, including invisible braces, Invisalign, SureSmile aligners and more. In the past, many of those solutions have depended on external vendors and manufacturers, who often charge high fees to develop products for individual patient needs.

While these vendors have worked closely with orthodontists to give them more input over the years, Lin explained they ultimately come up short: “You are really at the mercy of their digital lab.”

But with newer easy-to-use new technologies, such as 3D printing, orthodontists are finding more control over how they would like to transform their patient’s mouth. Not only can they 3D print models quickly, but they can create their own thermoformed aligners the way they want them. “We’re orthodontists,” said Dr. Lin. “We understand how to move teeth, how to space things. We have more control. So I think there’s an advantage there.”

What’s more, he added, “We can do it cost effectively and as a result we can save our patients money too.”



*Dr. Lin’s lab recently expanded to three technicians to accommodate the increasing amount of work as a result of their 3D printing technology and business growth.*

### **3D Scanning and Printing**

But to get started, it all starts with the scan.

For OSGB, that’s an intraoral scanning device, more specifically the 3 Shape Trios 3, which they have at all three practices. Sometimes, if necessary, the team can also desktop laser 3D scan an impression if necessary.

The ability to ship the file within seconds to the lab speeds the creation of the mold and solution development. Here, the digital approach also prevents challenges that can arise in the process, such as impressions that have been compromised with air bubbles or other distortions.

“It really truly has improved the diagnostics and treatment capabilities for the orthodontist,” Dr. Lin said of the scanning technologies.

### Choosing a 3D Printer

Dr. Lin researched 3D printers for more than 3 years before he ultimately decided on an [EnvisionTEC Micro](#), which was delivered in early 2015.

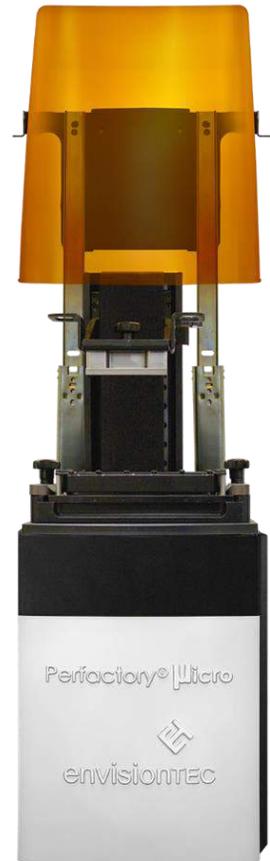
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*“It was brand new to all of us.” Dr.  
Edward Lin.*

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He looked at brands such as Stratasys and 3D Systems but decided to go with EnvisionTEC for some key reasons, such as precision for the price, print speed and the curing process. “My concern was over time there could be some distortion issues” without a final cure, Lin said, noting that it’s not uncommon to reuse a mold if a patient loses a retainer. He wanted to be assured of its durability.

The other factor that ranked high was customer support, and a feeling he could have a relationship with the team at EnvisionTEC.



*EnvisionTEC's original Micro Ortho model has been replaced by the Perfactory Vida.*

“I have been an early adopter,” Lin explained, “and when you do that, there’s got to be communication. You have to get involved in knowing who the go-to people are with these technology companies. When you build relationships outside of emails, and you put a face to the name or you can get on the phone and call somebody, it makes things happen much more rapidly.”

Getting his EnvisionTEC Micro up and running was a process that took several weeks of training and practice with the lab staff, which was two then and has since grown to three individuals.

“When we brought the 3D printing machine in, it was brand new to all of us,” Dr. Lin explained. “We were doing practice print jobs, getting things set up with the software and understanding how to set up a print tray, just going through the routine and practice.”

Once they had it mastered, Dr. Lin and his lab staff started running their Micro 3D printer around the clock, printing molds with EnvisionTEC’s E-Appliance material, without any issues. “Three jobs per day, morning, afternoon and evening,” Lin said, usually with 5-7 models per run. “We were running it hard.”

The team at OSGB enjoyed their new machine so much that they decided to buy [EnvisionTEC’s new Vida](#) after it launched in mid-2015. That new printer offers improved power, resolution to 73  $\mu\text{m}$ , more material options and a slightly larger work space, giving him 10-12 models per print run.

Once the OSGB team had experience with 3D printing, it was able to go live with its new Vida printer rapidly. “The second time around was very quick,” Lin said. “It’s been a workhorse.”

The lab staff also prefers a durable new dental material called Ortho Tough that is available on the Vida, because the reddish-pink color really allows them good visibility for appliance development.



*The EnvisionTEC Vida.*

Because of the power of the Vida projector, Lin was also intrigued by the possibilities of what new materials could be printed on that machine soon, in addition to its current material flexibility.

“Who knows how things are going to change?” Lin said.

### **Support for Technology is Critical**

Right about the time the new Vida arrived, Lin’s team started having printing challenges with this older Micro.

“With technology, any kind of technology, you’re going to have issues, it doesn’t matter if it’s a cellphone, desktop, laptop, wireless router,” said Lin, who noted that he is glad he chose a 3D printer company that he felt he had a relationship with. “It’s just a matter of how you handle things. EnvisionTEC has been very responsive. Support for technology is critical.”

### **Preparing for the Future**

Today, Lin is busy dreaming of new ways to use his 3D printers and talking to EnvisionTEC about new material and other development possibilities, where he feels his opinions are valued for the future.

For example, Lin and his staff are exploring printing new devices in new materials and loves the idea of printing a full appliance right on the 3D printer someday in the future.

“We’re printing indirect bonding trays now,” he said, noting that SureSmile has developed a system – Elemetrix 3D Printed Indirect Bonding – which allows for

intraoral scan and then placing of brackets digitally into a reverse model, or negative, which is eventually printed.

“All we do is place the bracket in the tray and it’s a transfer tray,” explained Dr. Lin, who has [written a column about the process](#) for the American Association of Orthodontics.

Dr. Lin is also continually honing the digital workflow in his office, from initial scan through labs and treatments, changing at least one thing a quarter with his partners and team.

In short, Dr. Lin is passionate about technology, the future of orthodontics, and what’s coming next.

“3d printing is an innovative, disruptive and what I also call transformative technology and it’s still evolving,” he said. “Even if you don’t have your orthodontic lab, you can upload that to an orthodontic lab in a few seconds, and they can start working, and they can 3D print the model. ... It’s changing quickly. We’re in a transition right now, not just us, but everybody.”



*Models printed in Ortho Tough on an EnvisionTEC Perfactory Vida and cured.*

## The Perfactory<sup>®</sup> Vida 3D Printer

### Machine Properties\*

- Build Envelope: 5.5" x 3.1" x 3.95"  
(140 x 79 x 100 mm)
- XY Resolution: 0.0029" (73 µm)
- Dynamic Z Resolution (material dependent): 0.001" to 0.006" (25 µm to 150 µm)
- Light Source: Industrial UV LED
- Data Handling: STL
- Warranty: 1-year back to factory including parts and labor
- Specifications are subject to change without notice.



### Materials Available

- E-Appliance M — Orthodontic models for salt and pepper techniques
- E-Denstone Peach M — Models for bracket placement through indirect bonding techniques
- Clear Guide M — Surgical drill guides
- E-Partial M — Partial denture framework
- Ortho Tough M — Rigid stable models for vacuum suckdown aligners and more

*\*Specifications subject to change without notice.*