



Clear Savings

FAST, ACCURATE MODELS DRIVE ORTHODONTIC APPLIANCE DEVELOPMENT

“Since we began leveraging Stratasys 3D printing technology, we’ve experienced faster turnarounds, better capabilities and a vibrant, growing business.”

– James Bonham, Specialty Appliances partner

CASE STUDY



Specialty Appliances, a digital orthodontic laboratory, uses Stratasys 3D printers to help manufacture these invisible retainers. 3D printing has helped the lab expand its business.

Digital technology that combines intraoral scanners and 3D printers provides a faster, better and more affordable means for creating an exact replica of a patient’s mouth. Advanced digital labs like Georgia-based Specialty Appliances can deliver high-quality orthodontic appliances in less time and create dental models at lower cost than the use of traditional stone models made from dental impressions.

Using its Objet Eden260V™ and Objet Eden500V™ 3D Printers, and the machines’ VeroDentPlus™ material, Specialty Appliances, a full-service digital orthodontic laboratory, cuts weeks from custom appliance development and creates more accurate, durable dental models at lower cost, resulting in fewer appointments and shorter treatment time for patients.

3D Printing Revolutionizing Orthodontics

Arlen Hurt, vice president of Specialty Appliances, saw how 3D scanning, modeling and printing technology could improve the field of orthodontics.

“Everything that we do in the development of an orthodontic appliance—whether it be a palatal expander or a Herbst appliance to correct an overbite—is based on a physical model,” Hurt explains. “With the advent of intraoral scanners, it became clear that printing dental models with a 3D printer would be faster, more accurate and less prone to human error than the traditional impression-based approach.”

Hurt adds that, “intraoral scanners and Stratasys 3D Printers have allowed us to deliver custom appliances a week sooner without the need to take impressions.”

Specialty Appliances added its first 3D printer — an Objet Eden260V 3D Printer — in 2011 and a second Objet Eden260V a year later. As printer usage increased from six percent of cases to 24 percent in just 18 months, the lab added a third, an Objet Eden500V 3D Printer.

“We looked at and evaluated every printer on the market, but we were drawn to Stratasys by its large number of references, easier approach to post-processing, and fewer maintenance issues,” Hurt recalls. “Once our usage exploded, we added the third printer because when you depend on a piece of equipment for production, you need a backup to support rapid growth.”

Stone Models vs. 3D Prints

In addition to saving time—stone models take a week to produce from an impression, while 3D printed models are made the same day that scan data arrives—3D printing provides other important advantages over traditional stone models. First, 3D printed models are more accurate and durable than stone models, which are highly dependent upon obtaining a good quality impression of the patient’s teeth. With their 3D printers, Specialty Appliances can produce dental models from intraoral scan data with a resolution that is within 40 microns of dimensions of the patient’s actual teeth.

Because 3D printed dental models are more durable—they don’t crumble and deteriorate like stone models—Specialty Appliances can make multiple appliances from a single print. This makes them more affordable than the traditional impression-based approach, which requires additional stone models to create additional appliances. The 3D printed dental models also offer increased accuracy and durability.

“Thirty years ago, nobody would have thought that this was possible,” says Hurt, but with advances in materials and productivity gains, “we know where our business is headed, and that 3D printing will play an important role in our growth and success.”



A 3D printed model for labial indirect bonding



An acrylic retainer fabricated on a Stratasys 3D printed model



Specialty Appliances says 3D printing is faster and more accurate when creating models like this Herbst appliance.

Fewer Appointments, Less Treatment Time

One of the most notable benefits is the need for fewer appointments and less treatment time for patients. In other words, patients can get their braces off sooner and avoid potential relapse or movement of the teeth between procedures.

"Taking impressions can consume entire appointments," notes James Bonham, a Specialty Appliances partner who manages sales and marketing. He says that 3D printing shortened a typical procedure—like mounting an appliance through a band or crown seated on the molars—from six weeks and three appointments to two weeks and two appointments. "Everyone benefits: the orthodontist, his staff and most importantly, the patient.

"Stratasys 3D Printers have helped us carve out a unique spot in the marketplace by enabling us to provide services to customers in a digital 3D world," Bonham continues. "Since we began leveraging Stratasys 3D printing technology, we've experienced faster turnarounds, better capabilities and a vibrant, growing business."



3D printed models like this articulator help reduce the number of appointments and appointment lengths.