

Intraoral scanners — an independent laboratory review

James Bonham explores several aspects to consider when shopping for intraoral scanners

The adoption rate of intraoral scanners in orthodontics has been quite impressive. Scanners have been around for several years, but recent upgrades have pushed the technology past early adoption and into the early majority stage. Our laboratory (Specialty Appliances) has witnessed this rapid growth of scanners into our customers' hands. We currently receive thousands of digital model files each month, including scans from all U.S.-sold intraoral scanner machines. Every type of orthodontic appliance can be fabricated from these digital impressions. This article expresses our independent experience and opinion of the digital scanner market in orthodontics.

Intraoral scanners capture highly accurate digital impressions, eliminating the need for physical impressions in most situations. The data is saved and can be exported as a generic stereolithography (STL) file to be digitally stored or shared with others. All scanners include 3D-image viewing software, allowing the doctor to instantly review the image for patient consultation. STL files can be sent to a 3D printer or milling machine for fabrication of a physical dental model or a digitally designed appliance. Digital orthodontic laboratories like Specialty Appliances can receive these STL files and immediately print the models for appliance fabrication. Not only does this process greatly reduce turnaround time, but the consistent accuracy of scans will yield appliances with an improved fit.

Not all intraoral scanners are the same. Features that are important to some offices are not as important to others. It is very crucial to understand the differences that will help you find the best fit for your practice. We highly recommend experiencing a live intraoral scanner demonstration in a real mouth, not a stone model, before making the final decision to incorporate this technology into

your practice. Several features to consider when shopping for intraoral scanners follow.

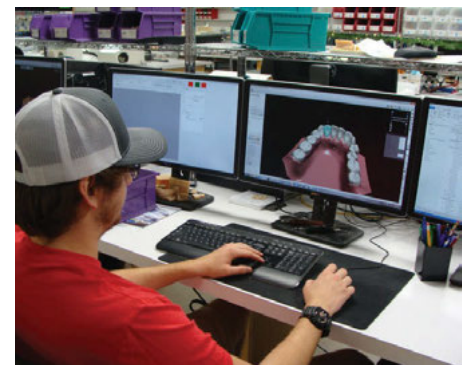
Scan quality

Most digital impressions we receive are high quality, but we also receive some with minor issues. These issues include holes (areas of missing data), flat areas (lacking accurate anatomy), noise (data that is not present in the mouth), double images (two images overlapping each other), and scans from machines that do not interpret brackets very well. Issues like these can be caused by the operator or the scanner itself. Digital models can usually be repaired by one of our experienced digital technicians, but sometimes they must be rejected.

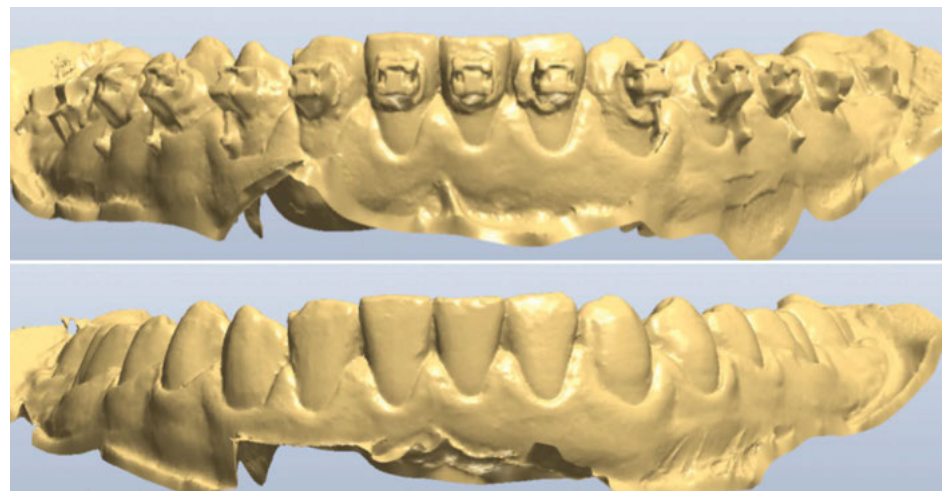
Scan time

Accurate scans have been around for years, but recent improvements in full mouth

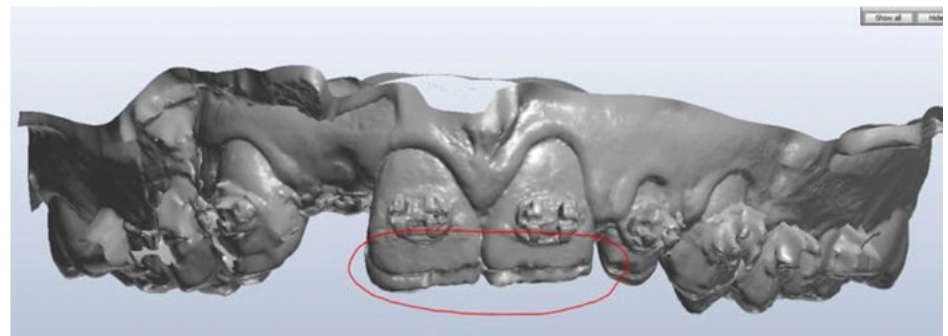
scan times (around 5 minutes or less) have pushed the technology into mainstream orthodontics. Digital impressions must be as fast as your current alginate process if your goal is to replace alginate. Successful scanner integration into your office will heavily



Specialty's digital technicians process hundreds of scans every day



Before and after bracket removal and scan cleanup



Example of double scan data



James Bonham is a partner at Specialty Appliances and manages sales and marketing. He has spent the past 12 years in orthodontics with a strong focus on the integration of digital technology into orthodontic practices.

depend on the staff's ability to take quick and accurate digital impressions. Again, the best way to evaluate scan time is to witness a live demonstration in a person's mouth.

Third-party integration

If you plan on routinely using a third-party company that accepts digital impressions, it is important to verify which scanners the company can accept. We do not recommend purchasing a scanner based on the promise of future integration. Specialty Appliances' laboratory accepts STL data files from all scanner manufacturers.

Portability

Intraoral scanners come in several shapes and sizes. Some have large monitors and computers attached to a rolling cart, while others are a small handpiece that plugs into a standard laptop. If you plan on using the scanner in multiple locations, inquire about the unit's portability.

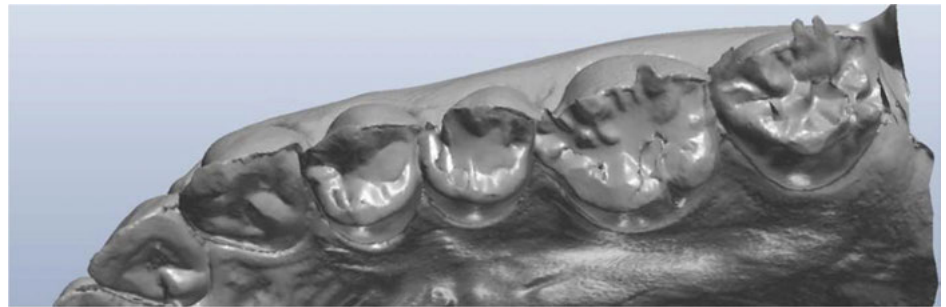
Cost of ownership

There are two common pricing models that you will see. Some companies offer their scanner at a lower price but include monthly fees for services such as support

and unlimited scans. Other companies may charge a higher fee upfront, but all scans and support fees are included. It is important to compare the cost of ownership over a 4- to 5-year period before making your decision.

Replacing alginate impressions with intraoral scanning technology will deliver tremendous benefits to your patients and practice. Before making your purchase, research the strengths of each scanner, have a hands-on demonstration, talk with other scanner users, and get feedback from an independent digital laboratory. This is one piece of technology you are sure to enjoy! **OP**

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Example of inaccurate occlusal anatomy

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