WHITE PAPER

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3D Printer Buyer's Guide for Orthodontics

Learn how to move from analog to digital workflows and find a 3D printer for your orthodontic lab or practice.

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Introduction

The future of orthodontics is inevitably digital. With cutting-edge digital solutions for digital impressions, treatment planning, design, and 3D printing, what was once prohibitively expensive is rapidly becoming accessible, already transforming thousands of orthodontic practices worldwide. As CAD/CAM technology continues to replace traditional workflows and become the standard of care, digital solutions have become a necessary consideration for any orthodontic practice or laboratory.

Throughout this white paper, you'll learn about:

- The benefits of going digital
- Digital workflows and how they differ from analog processes
- The best strategies for getting started with digital orthodontics
- The differences between 3D printing technologies
- Comprehensive criteria and aspects to evaluate before investing in a 3D printing solution

If you are managing an orthodontic lab or practice, look no further — this is your ultimate guide to digital orthodontics.

Why Go Digital?

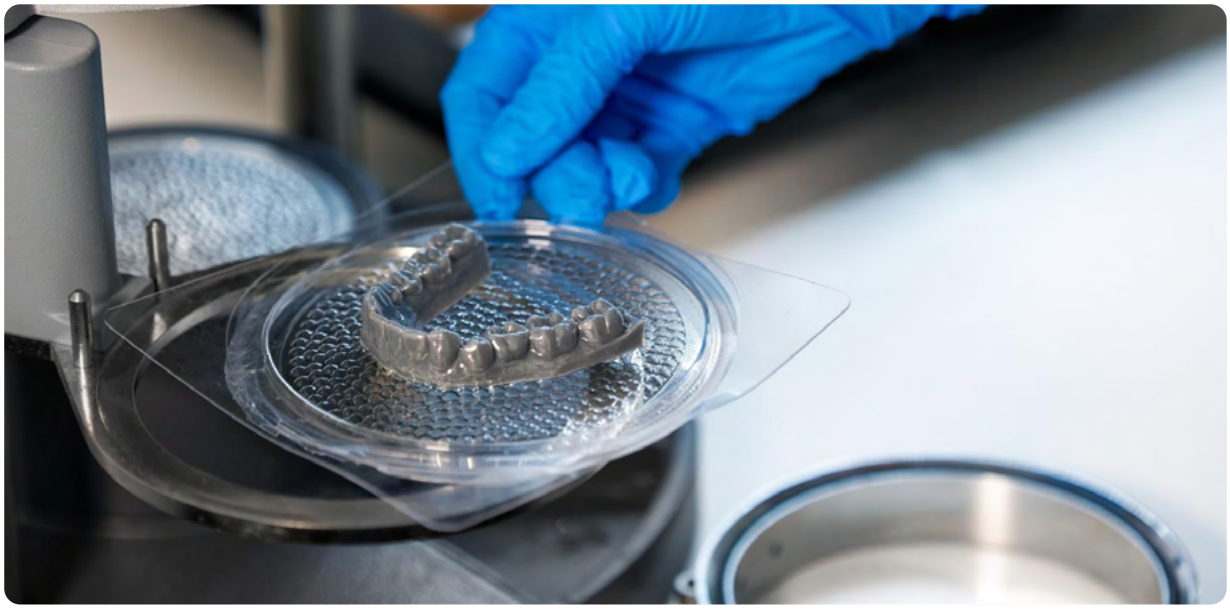
High Quality and Precision

No two orthodontic cases are the same. Patient anatomy is unique, and each treatment is tailored, enabled by a long history of custom, human-centric craftsmanship. But, as with any trade, quality is dependent on the skills of a given orthodontist, assistant, or technician, and achieving consistent, high-quality, affordable orthodontic products with so many potential sources of error is incredibly difficult.

Digital orthodontics reduces the number of steps and, therefore, the risks and uncertainties introduced by human factors, providing higher consistency, accuracy, efficiency, and precision at every stage of the workflow. 3D intraoral scanning removes many of the variables associated with taking a traditional impression, giving dental technicians more accurate data to design from.

Orthodontic CAD software tools provide visual interfaces similar to traditional workflows, with the added benefit of being able to automate certain steps, as well as easily identify and fix mistakes.

Digital manufacturing equipment such as 3D printers or milling machines deliver a range of high-quality custom products, prosthetics, and appliances with superior fit and repeatable results for fewer errors, lower costs, and increased clinical performance and experience for practices and patients.



Manufacturing thermoformed appliances like clear retainers and aligners over 3D printed orthodontic models is fast and affordable.

Improved Efficiency: Time and Cost Savings

Digital orthodontics improves the efficiency of procedures and streamlines workflows.

In an orthodontic practice, saving time on menial tasks means shorter appointments, increased throughput, and patient satisfaction. Taking impressions with 3D intraoral scanners is easy, reducing chair time and labor. Digital impressions cut out the cost of materials and the time required to ship impressions to a laboratory. Instant feedback and the elimination of manual errors like voids, bubbles, or tears reduces the need to duplicate impressions.

Intraoral scanners help reduce chair time and labor, and cut out the cost of materials and the need to ship impressions to the orthodontic laboratory.

Digital design and manufacturing increase productivity, reducing hands-on work for streamlined production, fewer remakes, and less time per part. Orthodontic CAD software tools are incredibly powerful and application-specific, enabling orthodontic professionals to plan and design a variety of orthodontic appliances.

In many countries, orthodontists are required to store patients' physical models and records for years. This often requires renting space or dedicating a significant part of the office to storage. With digital impressions, patient anatomy can be saved in the cloud or on a local server, requiring significantly less space and making searching for records easier. Additionally, patient models can be rapidly produced from these digital impressions on-demand with desktop 3D printers.

The field of orthodontics has been the fastest to adopt 3D printing as digital technologies enabled the rise of clear aligner therapy. 3D printed models are now the go-to method for producing clear aligners. On the latest dental 3D printers, like Form 4B, it's possible to print up to 11 models in as little as nine minutes for thermoforming clear aligners or retainers. On large-format 3D printers like Form 4BL, it's possible to print up to 32 models for thermoforming in 14 minutes, enabling efficient, high-volume production. Other orthodontic indications include manufacturing Hawley retainers over a 3D printed model or directly printing indirect bonding trays with biocompatible resins that enable the placement of multiple orthodontic brackets at once with increased accuracy and decreased chair time.

Consider starting with the following:

Models for core applications including quick retainers, bleaching trays, and diagnostic models

- No CAD software needed; use Preform's Scan to model
- Quick delivery time
- Easy to delegate
- ~$2-3 per model
- Cost savings >75%

Models for clear aligners

- Quick delivery time and independence
- Easy to delegate
- ~$2-3 per model
- Cost savings vs. outsourcing >80%

Indirect bonding trays

- Reduce patient chair time by half
- Easy to delegate
- ~$5-6 per part

3D printers can batch jobs together and operate unattended. This can be further optimized with the addition of automation, which enables 24/7 production, equating to a second shift worker.

Better Patient Experience and Outcomes

One of the most significant benefits of digital technologies is improved patient experience and comfort. A satisfied patient is more likely to follow treatment plans, return to a clinic, and recommend it to others, contributing to the long-term success of a practice.

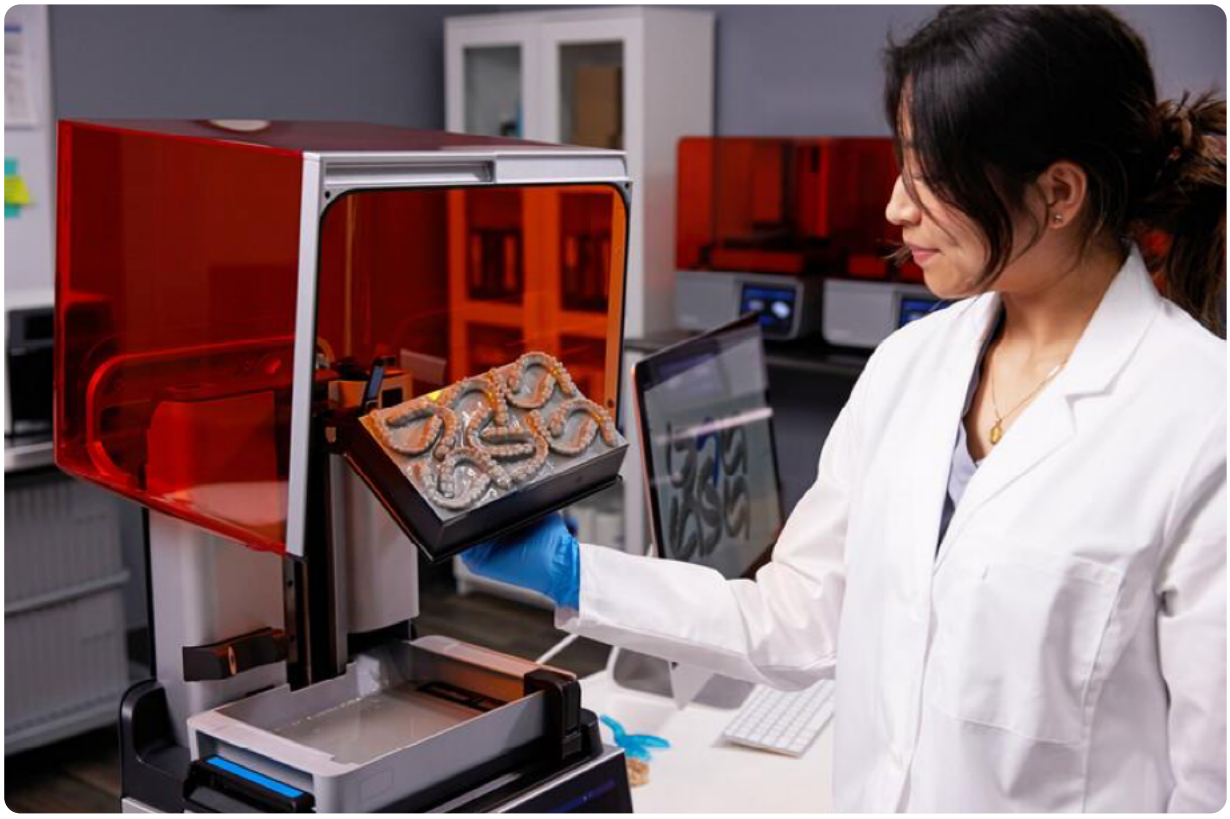
Digital technologies improve the workflow from diagnosis to planning to treatment. Intraoral scanning is faster and substantially more comfortable than regular impressions, while Cone Beam Computed Tomography (CBCT) scanning adds a new dataset to assist planning for implant surgery or further diagnosis in orthodontic treatments. Virtual treatment planning and appliance design enable less invasive treatments and better-fitting prosthetics. Digital tools also simplify communication between the dentist and patient, and the practice and lab, allowing for immediate data transmission and worldwide reachability.

3D printers can create temporary or permanent prosthetics chairside, so there's no need to wait when presented with an urgent case. If replacement aligners are needed, patients can quickly be presented with the appliances they need, removing potential gaps in treatment plans. Same-day and chairside delivery of appliances became possible thanks to digital production methods. Technical developments, including those found in Form 4 Series printers, are enabling professionals to provide same-day and chairside delivery of appliances. As a result, digital orthodontics makes for reduced chair time, faster treatments, and higher acceptance rates, all with scientifically proven, superior clinical outcomes.

3D printed indirect bonding trays enable the quick and accurate placement of multiple orthodontic brackets at once.

Business Opportunities

Orthodontics is going through rapid change. Orthodontic practices and labs that delay adopting new technologies risk falling behind their competition and leave money on the table by over-reliance on outsourced providers.



Print up to 11 clear aligner models in nine minutes with Form 4B and Fast Model Resin.

According to a 2022 survey by the Journal of the American Dental Association (JADA) 17% of respondents currently use a 3D printer, 67% of whom have been using it for two years or less. Adoption of 3D printers by practices is rapidly increasing as dental professionals look to control workflows, improve efficiency, and reduce costs and lead times.

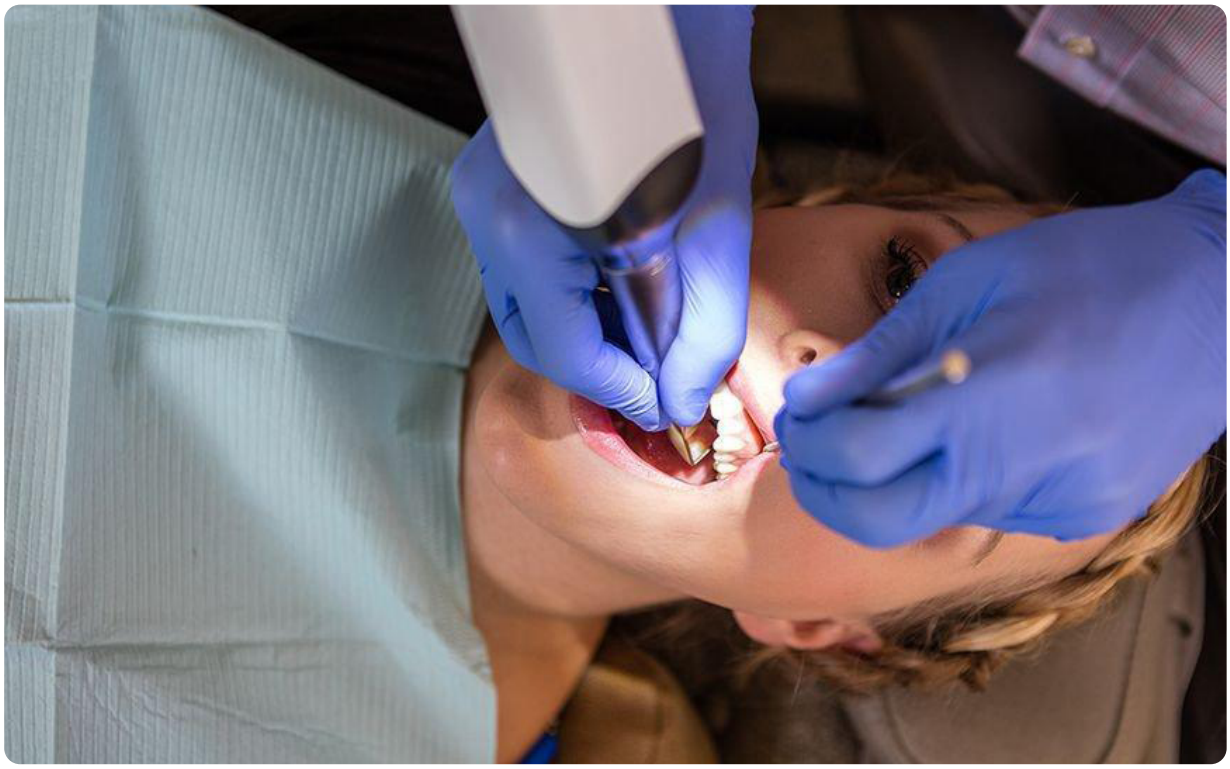
Labs have an even higher adoption rate. A survey of more than 215 dental labs in the US by Key Group Inc. in 2022 found that 57% (up from 45% in 2020) of dental labs in the United States have 3D printing technology and 66% are planning to purchase or lease a 3D printer in the next 12 months.

In a transnational study published in the International Dental Journal in 2023, more than 78% of respondents, all dental clinicians, utilize an intraoral scanner to take impressions. This represents significant opportunities for labs. Accepting digital impressions cuts out the lengthy shipping time for physical impressions, which can be distorted during the trip. As a result, digital labs can service clients in a wider geographical area or specialize in certain products.

The Digital Orthodontic Workflow

The planning of treatments and design of different appliances varies somewhat by specialty and application, but they all follow the same basic workflow.

1. Scan



An intraoral scan is more comfortable for the patient and has less chance of errors than taking traditional impressions.

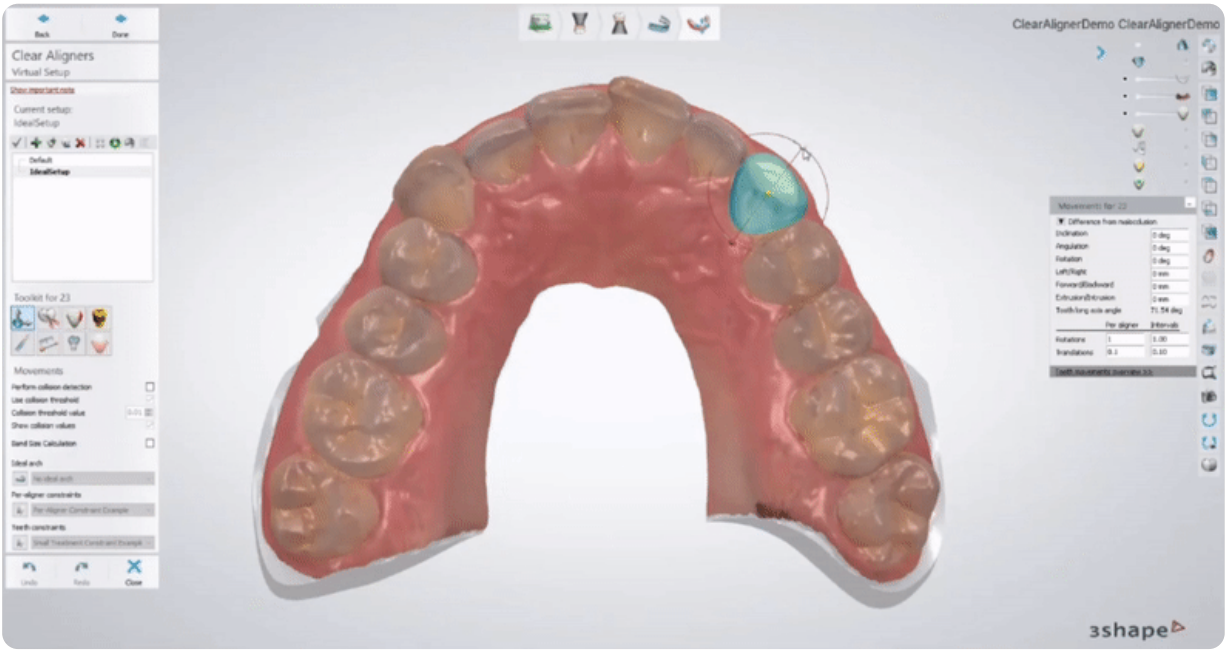
Like traditional orthodontic product fabrication, digital production starts with the patient's individual anatomy. 3D intraoral scanners can be used in the orthodontic practice to capture fast and accurate digital impressions from the patient, replacing manual impressions. Alternatively, desktop optical scanners in orthodontic labs can be used to scan traditional impressions or plaster models.

For complex rehabilitation cases, extraoral and intraoral photography and facial scanning provide further data to create highly accurate digital patient files.

Recommended tools:

- For an orthodontic practice: 3D intraoral scanner
- For an orthodontic lab: desktop optical scanner

2. Plan and Design



A model for thermoforming aligners being designed in 3Shape.

After scanning, patient anatomical data is imported into orthodontic CAD software for planning treatments and designing appliances, mock-ups, and models. For simple diagnostic models, you can also convert intraoral 3D scan files directly into printable dental models using Scan to Model in PreForm Dental, Formlabs' print-preparation software.

Most software packages use design processes very similar to traditional methods, employing highly visual interfaces with features like virtual articulators that are familiar to orthodontic technicians. Digital design results in easier, more precise treatments and simplified communication. After the treatments are designed, models can be exported for printing. If a remake is needed, the same digital design can be reprinted.

Orthodontic digital design services have also proliferated in recent years, empowering any dental business to get started easily without design knowledge.

Recommended tools:

- Orthodontic CAD software or design service
- PreForm Dental (free)

3. Manufacture

Hawley retainers can be produced digitally by manufacturing the appliance over a 3D printed model, greatly improving efficiency and reducing turnaround time.

To manufacture an appliance, 3D models are uploaded to the CAM or print-preparation software and then sent to a 3D printer. 3D printers are common in both orthodontic labs and practices and can produce appliances for a variety of indications.

3D printers work by solidifying parts (via photopolymerization) layer by layer to form the shape of the appliances and models. To create orthodontic appliances like clear aligners or retainers, thermoforming or other techniques are applied to the 3D printed models.

Recommended tools:

- For an orthodontic lab or practice: 3D printer

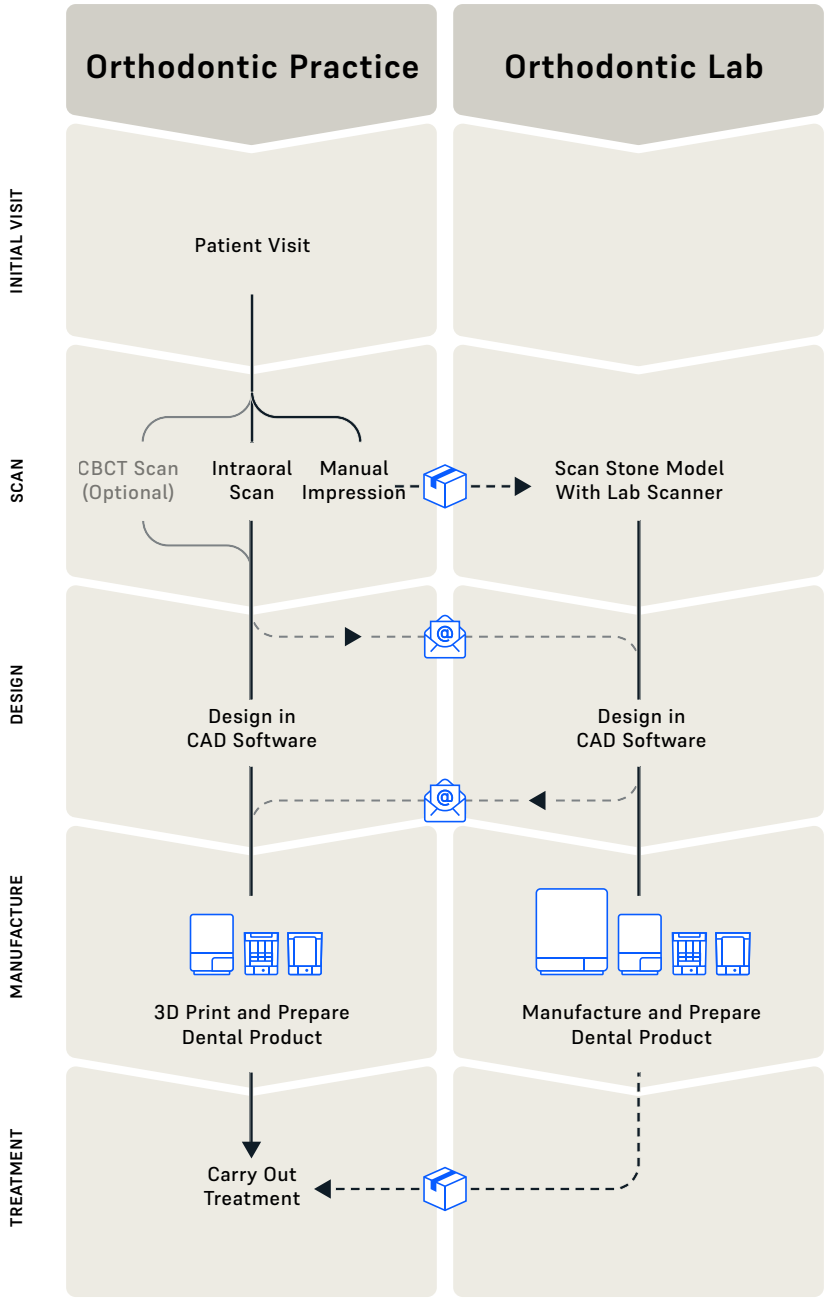
Workflows Between the Orthodontic Lab and Practice

With a traditional workflow, an orthodontic practice takes a physical impression of the patient and ships it to an orthodontic lab that creates the required models or other appliance(s). The lab then ships the final parts or appliances back to the practice for treatment. If there are mistakes in the physical impression or the fabricated appliance, additional time must be added to the process, including adding patient appointments.

In digital workflows, the individual steps can alternate easily between the orthodontic lab and practice depending on the complexity of the case, the indication, the tools available at a practice, and other conditions.

For example, an orthodontic practice can take a digital intraoral impression and instantaneously send it to a lab, or send a manual impression for scanning at the lab. Alternatively, an orthodontic practice can use a digital impression to design the models, restorations, and other indications in-house in CAD software or outsource design to a lab or design service. A practice can then manufacture simple parts in-house and rely on a lab for complex parts. Labs can manufacture parts in-house with 3D printing or milling or offer design as a service and send the design files to their customer for 3D printing in the orthodontic practice.

Overall, digital technologies simplify the workflow between the orthodontic practice and lab, offering unlimited freedom to optimize for speed, ease of use, or cost, depending on the case.



The digital orthodontics workflow can move back and forth between practice and lab, increasing efficiency and collaboration.

Dental 3D Printing Technologies Overview

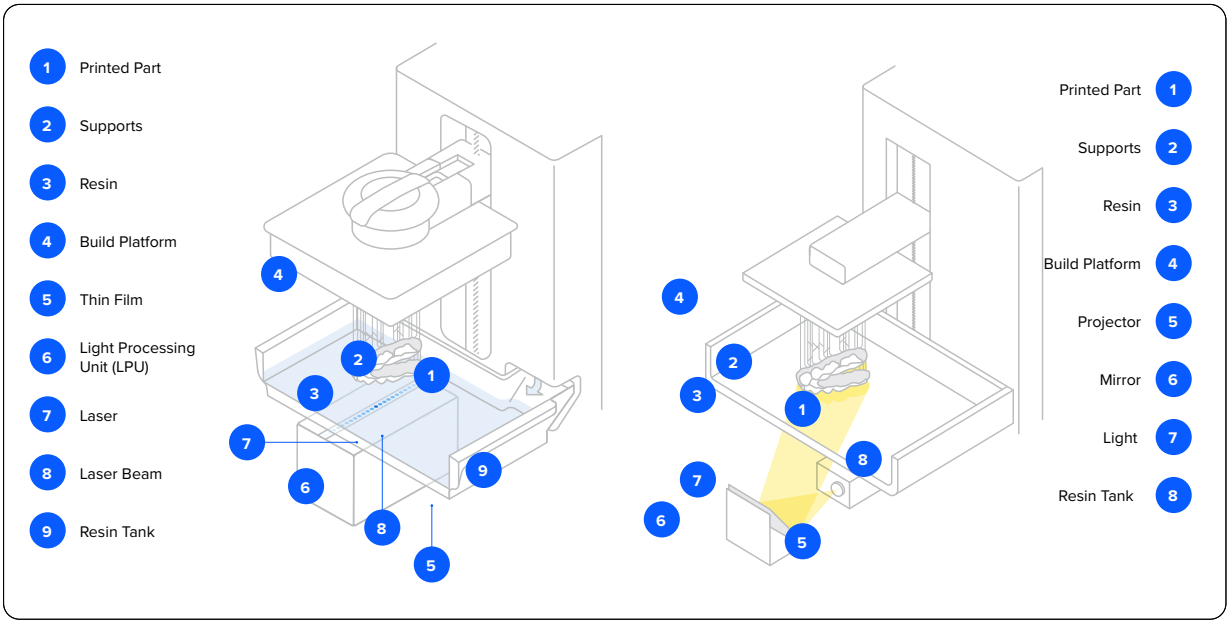
Today, three resin 3D printing technologies are common in dental and orthodontic practices and labs: **traditional (laser-based) stereolithography (SLA), digital light processing (DLP)**, and **masked stereolithography (MSLA)**.

In traditional SLA, a vat of liquid resin is selectively exposed to a laser across the print area, solidifying resin in specific areas. This exposure occurs layer by layer, building the print. Low Force Stereolithography™ (LFS) is an advanced form of laser SLA technology used by Form 3 Series printers. LFS reduces the strain created on a part when peeling it from the resin tank between layers, producing parts with a smooth surface finish, clarity, and accuracy.

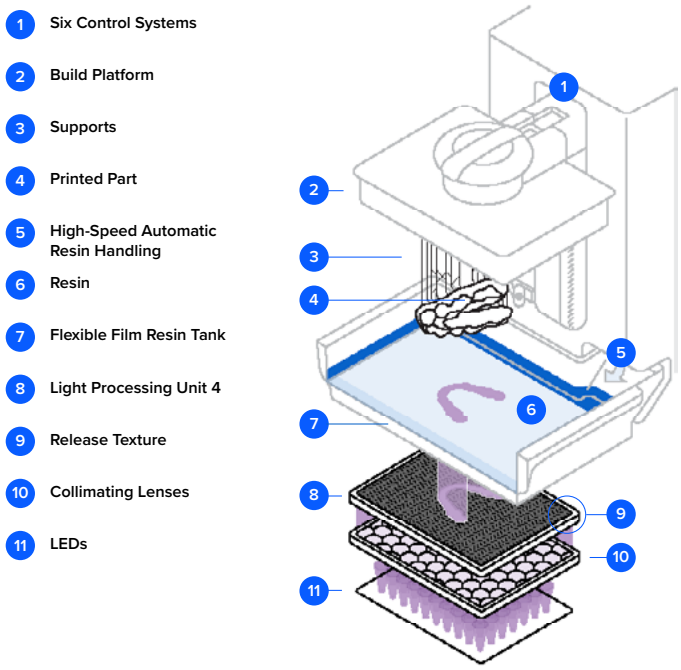
DLP operates with the same chemical process, but uses a digital projector as the light source and a micromirror device light-processing technique to selectively solidify the resin. With DLP, the entire layer gets cured at the same time.

MSLA uses the light from LEDs and an LCD as the light-processing solution to cure an entire layer rapidly and with high accuracy. Formlabs' Low Force Display™ (LFD) is an advanced form of MSLA, developed for Form 4 Series printers. LFD introduces a brand new technology stack including a backlight unit, light processing unit, release texture, and integrated camera, and significant improvements with updates to the flexible film tank, resin cartridge, automatic resin handling, and intelligent control systems to deliver the speed, reliability, and part quality that professionals need, all in a single printer.

LOW FORCE STEREOLITHOGRAPHY (LFS) DIGITAL LIGHT PROCESSING (DLP)



LOW FORCE DISPLAY (LFD)



The most common 3D printers for orthodontic applications work by selectively exposing liquid resin to a light source filtered and projected by various light-processing techniques to form very thin layers of material that stack up to create a solid object.

The way resin 3D printers work is similar. The differences in print quality, workflow, available materials, costs, and other factors are bigger from 3D printer to 3D printer than technology to technology.

How To Compare Dental 3D Printers

Speed and Throughput

For orthodontic practices and labs, it's important to consider both speed and throughput. While speed can equate to more prints in less time, variables including post-processing time and labor required will impact throughput.

For both DLP and MSLA, the entire layer is exposed at once. This means print speed is uniform across the build platform and depends only on the height of the parts in the Z-axis. Laser SLA 3D printers utilize a single laser to draw out each part. Generally, this means they can be slower when printing a densely covered print platform.

However, there's a trade-off between resolution and build volume for DLP printers. A small DLP 3D printer might be able to print fast, but you can only fit a few models on the build platform. A different printer with a larger build volume might be able to print more parts, but only at a lower resolution, which means that it might not be accurate enough for printing restorative models or surgical guides that require higher accuracy.

MSLA printers combine build volume and speed, for the best of both worlds. LFD technology takes this one step further, combining speed and accuracy across the build platform in one printer.

With the LFD Print Engine of Form 4 Series printers, surface accuracy is over 95% of data points within 50 µm of the original CAD data consistent across the build platform – while being able to print 11 models in nine minutes on Form 4B, and 32 models in 14 minutes on Form 4BL.

The Power of Printer Fleets

Another important consideration, especially for orthodontic labs, is whether to fulfill capacity with a single printer or multiple printers. Production with printer fleets often reduces upfront costs compared to larger-format printers. By buying one printer at first, labs can test out production methods before ultimately scaling up production with demand.

This provides the opportunity to pay for production only when it is needed, rather than making large long-term investments in a rapidly evolving market. Printer fleets with multiple printers also empower the printing of multiple different appliances, and different materials, at once, and reduce risk through redundancy. If one printer needs servicing, production can be balanced across the rest of the printer fleet.

Printer fleets allow 3D printing for multiple different applications in parallel, balancing production needs and lowering risk through redundancy.

Printer fleet management can also be automated, minimizing touchpoints and freeing up workers for higher-value tasks. For example, Formlabs' Fleet Control enables automatic print-to-printer assignment, streamlined queueing, and optimized workflow management. In a lab setting, this allows multiple users to collaborate, adding, duplicating, and prioritizing prints across an entire fleet of printers.

High-Throughput With Large Format Printers

For dental and orthodontic labs with high-throughput needs, large format printers can print more models or appliances at one time, minimizing user interactions for efficient production. Batching prints also makes for less time spent post-processing.

For example, three batches of 11 models on Form 4B would require staff to remove the build platform and post-process three times, for a total of 33 models. In comparison, printing 32 models on Form 4BL would batch all the models together, requiring only one interaction with the printer to remove the build platform and post-process models.

Form 4BL has a 2.7x larger build surface than Form 4B, unlocking the ability to print more than 120 orthodontic models per hour with Fast Model Resin at 160 µm.

Many labs find that one application is printed at higher volumes than others, often models. If this is the case, it's worth considering the cost-savings and labor efficiency of purchasing a large-format 3D printer exclusively for printing this high-volume application.

Adding Automation

Automating 3D printing is becoming an increasingly attractive option for orthodontic labs, as well as for orthodontic practices that want the ability to print multiple batches of prints without interacting with the printer. With the slower print speeds of some dental 3D printers, the addition of automation, such as the Formlabs Automation Ecosystem, enables 24/7 production, as hardware removes prints from the Build Platform 2 and starts the next print. However, the high-throughput and blazing speeds of Form 4BL enable even more production volume in a single work day than printing for 24 hours.

When comparing a printer to an automated solution, it's important to look at the number of prints in both a 24-hour period and when printing 24/7, all while factoring in the labor required to print on a printer without automation.

Alvetro Orthodontics leverages the Form Auto for in-house production, saving costs and improving efficiency.

For example, a printer with automation hardware can print for an entire weekend without needing worker interactions. By contrast, printing 32 models in 14 minutes on Form 4BL then requires a worker to remove parts from a build platform and replace the platform before the next print begins. Depending upon your unique business requirements, automation may be the most efficient solution.

Accuracy and Precision

Guaranteeing accurate, high-quality final parts is the most important concern for any orthodontic practice or lab. Unfortunately, not all 3D printers marketed for orthodontic applications can deliver the quality, precision, and accuracy needed. Additionally, comparing different 3D printers goes beyond looking at technical spec sheets.

Some manufacturers may try to confuse prospective customers with misleading statements and technical specifications. Most commonly, they indicate layer height, laser spot size, or pixel size as "accuracy," even though these specifications do not have a direct impact on the accuracy of final parts. While most companies refer to a single number for accuracy (i.e. 50 µm or 75 µm), these are typically marketing gimmicks, and most commonly represent the limit of resolution of the printer.

Fundamentally, accuracy and precision depend on many different factors: the quality of the 3D printer, the 3D printing technology, materials, software settings, post-processing, and how well-calibrated all of these systems are, so a 3D printer can only be judged on its final models and appliances.

Always evaluate accuracy studies with real scan data of printed parts. Even better, ask for a sample part or a custom sample of your own design to check the fit or measure yourself against the original design.

Form 4 Series printers print highly accurate parts anywhere on the Build Platform.

Ease of Use

Ease of use is key not just for onboarding and training, but for daily operations and delegation. After all, you and your team are going to have to learn how to use the equipment and incorporate it into daily work. Try to get a sense of the learning curve that will come with a new 3D printer by watching tutorials, visiting a trade show, contacting sales teams, or asking colleagues about their experience.

The availability of educational resources and guides makes learning new workflows and applications easier. Many companies offer free guides, tutorials, webinars, and even courses to help you get up to speed with the latest, clinically-approved applications.

Some printers come with proprietary software to prepare 3D models for printing, such as PreForm Dental for Formlabs 3D printers, while other manufacturers offer off-the-shelf solutions. Features differ by software tool. For example, PreForm Dental offers a one-click print setup, where automatic algorithms set up your model's layout, orientation, and supports based on customizable presets for each indication, so anyone in your office can print successfully without extensive training. With Scan to Model, intraoral scans can be converted into solid printable dental models in less than 10 seconds. Plus, advanced users can create custom presets with preferred material, layer height, orientation, and support settings.

Consider the types of everyday interactions as well as regular maintenance the printer will need once it is up and running. For example, some printers require you to manually refill resin, whereas others are automated. Form 4B and Form 4BL include intelligent maintenance modes to keep the printer running smoothly. Additionally, six onboard control systems precisely measure and maintain the temperature, resin level, print forces, and print status inside the printer, shortening the pre-print process and freeing up you or your technicians for higher-value tasks.

Once a model or appliance is printed, it must be removed from the build platform. Removing prints can result in scratches, broken models, or part defects. Form 4B's Build Platform Flex and Form 4BL's Build Platform Flex L feature Quick Release Technology, which allows you to remove parts without the use of tools by moving stainless steel side handles.

Build Platform Flex with Quick Release Technology allows for the removal of parts without the use of tools.

Resin 3D prints require post-processing after printing. Post-processing involves hands-on labor, so workflow, space requirements, and labor needs should be considered.

First, the parts need to be washed in a solvent to remove excess resin. Automated wash cycles, such as those of the Form Wash and Form Wash L, can increase efficiency.

Biocompatible dental parts also require post-curing. Formlabs offers high-speed, desktop, and large-format solutions to automate these steps, saving time and effort, and making a big difference in keeping a clean, low-maintenance production environment.

Form Wash, Form Cure, and Fast Cure automate post-processing, saving time and effort.

Lastly, depending on the design, some parts need to be cleared of support structures. To simplify this step, Formlabs resin printers offer light touch supports that greatly reduce both the need for finishing and costly labor. Plus, with Build Platform Flex, some parts can be printed directly on the build platform – without supports.

Early 3D printers had an infamous reputation for spending half of their lives in service, with many failed prints even when they were online. Fortunately, more recent generations of printers deliver greatly improved reliability. Dig deep into published reliability information, and make sure that a manufacturer has appropriate warranties and service offerings to ensure you'll be taken care of if service is needed.

Cost and Return on Investment

When you consider adopting a new technology, it needs to make sense for your business. Dental 3D printer prices have dropped significantly since the early days and the systems on the market today offer the lowest costs for many applications.

For example, a practice or lab printing models to produce thermoformed aligners in-house can often reduce costs by 75-95% for each part compared to outsourcing to labs or service providers — enough to pay for a 3D printer in a few weeks and save many times its price tag over the years.

When you compare dental 3D printers, remember to consider:

1. Upfront costs, including not just the machine cost, but also training, setup, and potentially software.
2. Running costs, best estimated with per-unit material costs.
3. Servicing and maintenance costs, which can be expensive without a service plan.

Materials and Applications

Formlabs offers 15+ dental resins, including biocompatible resins produced at our FDA-registered facility in Ohio

Professional 3D printers are some of the most versatile tools found today in orthodontic practices and labs, and the key to their versatility is dedicated materials.

Material selection varies by printer brand and model. Some basic 3D printers can only produce a few indications like diagnostic models, while more advanced systems such as Form 4B/BL can manufacture appliances for applications including:

- Diagnostic models
- Clear aligner models
- Splints, mouthguards, and occlusal guards
- Orthodontic models for Hawley Retainers
- Indirect bonding trays

Some 3D printers work only with proprietary materials, which means your options are limited to the offerings of the printer manufacturer. Others have an open system, meaning that they can use materials made by third-party manufacturers.

However, when using third-party materials, it's important to make sure that the results achieve clinically acceptable quality and accuracy. Furthermore, using biocompatible materials on non-validated 3D printers that claim to be "open" breaks the usage requirements and will produce non-biocompatible appliances. Be careful that you know what risks your business takes by using non-validated 3D printers and materials.

It's important to check the available materials for a given 3D printer against the list of appliances you're looking to print. However, it's common to regularly release new materials and updated formulations, so there's a good chance that the printer you buy today will become capable of creating an increasing variety of dental products in the near future.

Form 4B can print 15+ dental-specific Formlabs resins including biocompatible resins developed and validated under a stringent QMS and produced in an ISO 13485-certified facility. For even more freedom, open material and print settings are available.

How To Implement Digital Workflows in an Orthodontic Practice or Lab

1. Pick an Application

Transitioning to digital orthodontics doesn't need to happen all at once. Start with the easiest 3D printing workflows first, build your team's expertise, and gradually add new applications to avoid unnecessary risks.

The best place to start is with models. These are the easiest parts to 3D print because they don't require third-party design software to prepare a digital impression for printing. Formlabs Dental 3D printer customers can use the Scan to Model feature in PreForm Dental software to turn their digital impressions into physical models for free. These models can be used as diagnostic models or as molds for thermoforming retainers or bleaching trays in-house. Additionally, the ability to 3D print models means you can store files rather than physical models, freeing up valuable office space.

If you want to start with something other than simple models, choose an application that is currently inefficient, unreliable, expensive, or in high demand. Clear aligners have simple, quickly learned workflows. Design can be executed in-house with design software, or you can outsource this step to a design service like Evident, 3Shape Design Service, or Digital Smile Design, and still do the appliance manufacturing in-house. Whatever you choose, start with a single use case and extend to multiple applications, while continuing to rely on labs for complex cases and final restorations for maximum efficiency and accuracy.

For orthodontic labs, 3D printers offer a variety of digital workflows. Professional 3D printers are incredibly versatile: it's possible to manufacture a wide range of products on the same printer just by switching materials. Explore the complete dental resin library and dental indications to learn more about the versatility of 3D printing.

2. Define and Test a Digital Workflow

When you have a specific application in mind, piece together the complete step-by-step digital workflow for that application to make sure you understand all the pieces needed for scanning, design, and manufacturing, and how to time this for your practice or lab.

Educational resources, including step-by-step workflows, are available online to help ease the process of learning new indications. Formlabs offers an extensive resource library and the Formlabs Dental Academy, a hub of free courses for learning and building digital dentistry skills.

If you're running an orthodontic lab, consider whether you'll only receive digital impressions from orthodontists or if you'll need a desktop optical scanner to scan stone models or physical impressions.

If you're planning to design parts in-house, make sure to get a demonstration of the workflow of any design software to understand the step-by-step process before adopting it. Then, select a dental software package compatible with the scanning and manufacturing equipment of your choice. The easiest way to do this is to stick with software that allows open importing of scan files, and open STL file export, which ensures compatibility with all 3D printing solutions.

When considering manufacturing equipment such as milling machines or 3D printers, always source samples before buying equipment. Technical data and marketing specs can be misleading and hard to decipher. Instead of comparing sales brochures, compare actual parts — don't hesitate to ask for a physical sample of the indication you're looking to produce. There's no better way to compare quality between two systems than holding the final product in your hand.

Explore dental application guides to learn more about digital dentistry workflows.

3. Start Small and Scale Up

Once you're ready to start, trial the workflow for a few weeks before moving to full production, leaving time to learn each step and iron out any wrinkles. As you get comfortable with the results, switch the workflow fully to digital, and start scaling up.

Using Dental LT Comfort Resin, Formlabs 3D printers can manufacture flexible occlusal splints in-house. Printed appliances are easily polished to high optical transparency, and offer enhanced comfort and durability that boosts patient adoption and compliance.

In digital workflows, scaling up can include adding scanning, design, or production capacity or expanding to more complex applications. Desktop 3D printers offer more production flexibility than ever before, with access to a library of resins – including biocompatible ones – that can easily be changed out for an agile production process.

Expanding Applications in a Orthodontic Lab

BEGINNER	INTERMEDIATE	ADVANCED
• Diagnostic models	• Occlusal splints and guards	• Temporary restorations
• Clear aligner models		
• Indirect bonding trays		
• Custom impression trays		

When scaling up, adding printers can bring added benefits. A significant advantage of affordable desktop printers over larger, more expensive systems, is the ability to add additional printers for redundancy. Printers can also be devoted to specific materials. For example, one printer can print models for clear aligners while another is dedicated to indirect bonding trays, for even more efficient production.

Offering a new product or service doesn't have to be a difficult decision with a long-term return on investment. With digital orthodontics, you can start small, see faster returns on investment, and scale up over time.

Get Started With Digital Orthodontics and 3D Printing

With thousands of orthodontic practices and labs already adopting digital workflows, there's never been a better time to start exploring how to take advantage of new technology in your business. While 3D printers were only affordable to the largest orthodontic labs and milling centers a few years ago, they are now a common sight in orthodontic practices and labs.

Consider the factors discussed above and the needs of your practice or lab — some solutions might suit some businesses better than others. Make sure to do your research, evaluate actual parts, and avoid paying a hefty premium.

Explore Formlabs orthodontics resources for free guides, step-by-step tutorials, white papers, and webinars to learn how you can integrate 3D printing into your practice.

Curious to see our quality firsthand? Pick a material and we'll ship you a free sample part 3D printed on Form 4B to evaluate or talk to a 3D printing expert to learn how you can meet your business goals.