

# REVOLUTIONIZING DENTAL LABS



**Carbon is more than a 3D printer. We partner in success with each of our customers.**

Our new dental product line is designed to deliver high reliability, accuracy and instant ROI to dental labs of all sizes.

Built in Silicon Valley and powered by Digital Light Synthesis™ (DLS) technology, the Carbon platform delivers top materials, regular software updates and validated digital lab workflows. Our customers embrace technology and enjoy unparalleled uptimes with unprecedented service and support.

**Carbon®**

# One Platform for Every Lab Application

Carbon has the right end-to-end solutions for any dental application. Start with our M2d or M2 printer, add the Smart Part Washer and grow into our C6 cassette. For the clear aligner market, choose the L1 Production Solution for high-volume model production. Our open approach means you can now scan, design, and print using your preferred digital workflow. By going with Carbon, your lab will increase productivity, efficiency, and ROI.

## M2d Printer

With a smaller build area, lower throughput laboratories now have access to Carbon DLS technology with the same quality and reliability of the M2. To provide a scalable solution, Carbon can perform a simple software update, enabling access to the entire M2 build area. The M2d is ideal for entry-level labs because it accommodates increasing throughput and growth with no downtime or additional printers.

## M2 Printer

The M2 provides a build area measuring 189 mm x 118 mm, advanced manufacturing features, and groundbreaking Carbon DLS technology. This printer supports higher throughput of large parts and includes a connector expansion port for smart accessories. The M2 is well suited to mid-to-large size laboratories.

## Smart Part Washer

The Carbon Smart Part Washer (SPW) is a fully connected smart device that pairs with the M2 and M2d. The SPW software generates the ideal wash profile based on dental model geometry and DPR 10 resin and automates the manual washing of printed models. The SPW consistently cleans parts with less manual contact of uncured parts in a 7-8 minute wash cycle. A notification occurs when it is time to change the solvent (approximately every 30 washes).

## C6 Cassette

The C6 cassette is an option to M2 printers and enables printing DPR 10 models up to twice as fast as the stock cassette. With a lower print time, the C6 cassette is an excellent option for labs looking for higher volume from their M2 printer.

## L1 Production Solution

The L1 is our end-to-end solution specifically designed for high-volume production of orthodontic models for thermoforming. This solution is built around the L1 printer, offering a build area five times larger than an M2, delivering 800-1,000 ortho models during each 20 hour workday. The L1 Production Solution is a complete factory-in-a-box.

- A validated workflow from resin to finished models in under an hour
- Pre-processing software for auto-nesting and product tracking
- Custom racks and training
- Solvent-less post-processing with proprietary Carbon spinner technology
- Massive scalability to tens of thousands of models per day

The Carbon printer family and Smart Part Washer.

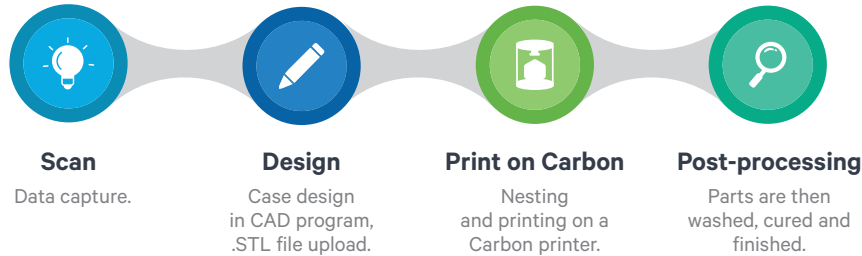


Intuitive user interface.



## Always Current Software and Validated Workflows

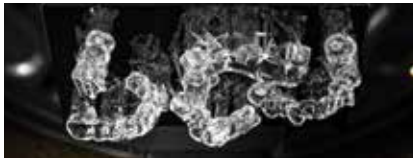
Carbon provides an intuitive user interface and software platform, which enables over-the-air updates, branded parts, and personalized account support. Our platform supports a simple and open workflow so dental products can be digitally produced from any .STL file, and our innovative software provides for autonesting, part traceability and serialization, which are essential in a highly regulated environment. In addition, we have validated workflows with 3Shape, exocad and AvaDent, with more on the way.



## Top Materials with Broad Application Support

Carbon delivers the broadest range of 3D printed applications for dental labs because we prioritize materials. We invest in the best resins, all available on the M2 and M2d, including the first FDA-cleared (Class II) 3D printed denture solution comprised of both a denture base and teeth. We are always researching and working with our partners on resins that are optimized for speed and accuracy in our printers to keep on the forefront of dental technology, while ensuring patient safety. As a result, we have an exclusive with Keystone for KeySplint Soft™ Clear.

## 3D Printing Applications



Surgical Guide



Denture Base



Denture Teeth



Impression Tray



Gingiva Mask



Models and Dies



Castable



Indirect Bonding Tray



Splint — Exclusive on KeySplint Soft Clear

Application	Castables	Dentures (base + teeth)	Gingiva Masks	Impression Trays	Indirect Bonding Trays (IBT)	Models & Dies	Splints	Surgical Guide
Resin	Dreve FotoDent® cast	Dentca™ Premium	Dreve FotoDent gingiva	Dreve FotoDent tray	Dreve FotoDent IBT	Carbon DPR 10	Keystone KeySplint Soft Clear	Whip Mix®

# Real-world Return on Investment

Founded in 1990, Ziemek Laboratories has multiple locations specializing in crowns, implants, removable products, and all aspects of digital dentistry. Having served the dental industry for almost 30 years, Ziemek has built a strong reputation based upon their attention to detail and strong customer service and support.

Many dental office clients request crowns, implants, and removables that originate from digital impression scanners, and Ziemek would leverage external production facilities to make the dental models and

models with dies. Making high-quality dental models and dies is a critical intermediate step for producing accurate crowns, implants, and removables.

As business grew, Ziemek decided to explore bringing production in-house to get more control over quality, consistency and outsourcing costs. After a detailed competitive analysis and rigorous assessment of the return on investment (ROI) between the Carbon subscription and the closest competing printer, Carbon emerged as the clear winner.

## Ziemek's Analysis

Metric	Carbon	Competitor
Acquisition Method	Subscription	One-time purchase
Technology	DLS	Polymer jetting
Speed	Fast	Slow
\$ / quad calculations	Low	Slightly higher
Service + Support	Excellent response time	Adequate
Machine reliability	Excellent	Adequate
Materials roadmap	Strong roadmap with materials science focus. One printer for multiple dental products	Sufficient. Limited materials science focus
Software experience	All inclusive upgrades with excellent user experience + tools	Cost to upgrade + printer downtime to upgrade, lack of tools
Hardware obsolescence	Not applicable, subscription model	Unknown

**“Carbon’s service and support is truly a supportive and collaborative partnership. They are always working to make us more successful. They value our feedback and strive to provide solutions that fit our needs.”**

— Paul Valencia, CAD Solutions Manager, Ziemek

## ROI Framework and Early Results

- **Lower costs:** Initial calculations showed model cost to be 12% lower on Carbon, with an estimate of 27% at full efficiency.
- **Higher throughput:** With Carbon’s 100% digital manufacturing solution, Ziemek increased digital workflow speed, cutting turnaround time up to 40% on some product lines.
- **Higher customer satisfaction:** Ziemek is now able to proactively address customer rush requests with consistently faster turnarounds, instead of waiting up to five days for an outsourced model.
- **Business growth potential:** Ziemek’s team saw the potential of launching entirely new product lines leveraging Carbon’s technology and strong materials focus.

# Opening New Business with Clear Aligners

In the spring of 2018, Derby Dental Lab added their Smile Shapers® aligner division, working with dental labs new to the clear aligner market who were looking to quickly grow in the category. With a sharp focus on partnering with dental labs to offer the Smile Shapers Clear Aligners to their customers, Derby initially invested in one Carbon M2 printer to produce tens of thousands of printed models for thermoforming.

To succeed in thermoforming, Derby forecast printing 320 models per 10-hour day or between 5,000 and 6,500 models per month, so they needed a technology that produces models reliably without downtime. In the past, they would purchase redundant equipment to make up for equipment downtime, with an end goal of keeping

staff from becoming frustrated. Of course, no lab wants the added costs of redundant hardware, so Carbon's reliability was very important.

Poor product quality can triple the cost of an individual dental model due to the expense of repeat work, opportunity costs associated with employee time and equipment resources, and shipping cost. Losing recurring business due to quality issues is always a risk. Of all the benefits derived from the Carbon solution, the most significant benefit is printing large numbers of quality, accurate models. With one Carbon M2, Derby Dental opened new business printing hundreds of models per day at very high quality with no redundant hardware needed.

**“The subscription model is beneficial as we are able to make payments over time versus one large capital investment. This enables us to keep costs down and allows for the flexibility to add more printers as the division grows.”**

— **Nick Windlow**, Director of Business Development, Smile Shapers

## And still growing bigger

Derby Dental Lab's venture into thermoforming was an 18-month process as they received FDA and 510k approvals for their thermoforming business using Carbon's technology. Within a short time, they worked with their Carbon account manager to arrange for another M2 printer to support their growing business.

To support their continued growth, in 2019 Derby added the Carbon Smart Part Washer to improve post-processing and acquired the L1 Production Solution for high-volume model production to support their thermoforming business.

### L1 Production Solution for Clear Aligners



Print



Spin



Cure



Model

## Carbon Means Top Reliability

Dental labs making the transition to digital production need reliability. Production disruption leads to cases not being finished on time and missed delivery dates. On-time case delivery consistently ranks as one of the most important attributes of a high quality dental lab among dentists, and unreliable case delivery is one of the top reasons dentists will leave a lab to find a new one. Carbon printers set the standard for reliability, with many Carbon Partner labs reporting over 98% uptime with their printers.

## Clinically Acceptable Accuracy

Accuracy is the most crucial factor to consider when adopting 3D printing into a dental lab for applications from crown and bridge models to digital dentures. Dental restorations are custom tailored with precision to each individual patient. With no room for error in the highly competitive dental lab industry, inaccurately printed models and other restorative products can lead to fit failures in the mouth, unhappy patients and unsatisfied dentists. With accuracy often within +/- 50 µm, Carbon printers enable labs to consistently deliver the highest quality restorations.

## Trust Your Success to Carbon

Carbon is more than a printer, we are a partner committed to the success of each of our lab customers. Your Carbon printer reports over one million datapoints each day that we analyze to make sure your printer is running at peak efficiency, along with monitoring key statistics such as print hours, jobs and resin usage to allow you to track your productivity.

## The Benefits of a Carbon Subscription

Technology has never evolved faster. Dental labs making large investments know this and have gotten used to purchasing equipment that is state of the art and then obsolete within a few short years. Carbon has reimagined and solved this frustration with a subscription business plan so that our printers improve over time. Your Carbon subscription includes all scheduled maintenance and a proactive approach to service with remote monitoring and service notifications before something goes wrong. Carbon is committed to your success and our proactive maintenance is just another way we are much more than a 3D printer.



Carbon offers the best resins available for models and dies, gingiva masks, surgical guides and impression trays.

**Revolutionize your lab today. Get started by contacting us at [dental@carbon3d.com](mailto:dental@carbon3d.com) or calling us at +1.650.285.6307**  
Learn more at [www.carbon3d.com](http://www.carbon3d.com)

# Carbon®

## ONLY WITH CARBON

### Best-in-Class Offerings

- Business Growth + Partnership
- Speed + Productivity
- Access to the Latest Offerings
- Simple, Validated Workflows
- All-Inclusive Service + Support

### Reliable Hardware

- Tailored to Suit Your Business Needs
- Unmatched Uptimes with Excellent Consistency
- Proven + Accurate

### Innovative Software

- Data + Analytics
- Over-the-air Upgrades + Support
- Branded Parts
- Upgradeable Throughput
- Serialization + Traceability of Parts

### Digital Dentistry Printing Applications

- Models + Dies
- Denture Base + Teeth
- Surgical Guides
- Impression Trays
- Thermoforming
- Gingiva Masks
- Castables
- Indirect Bonding Trays

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