

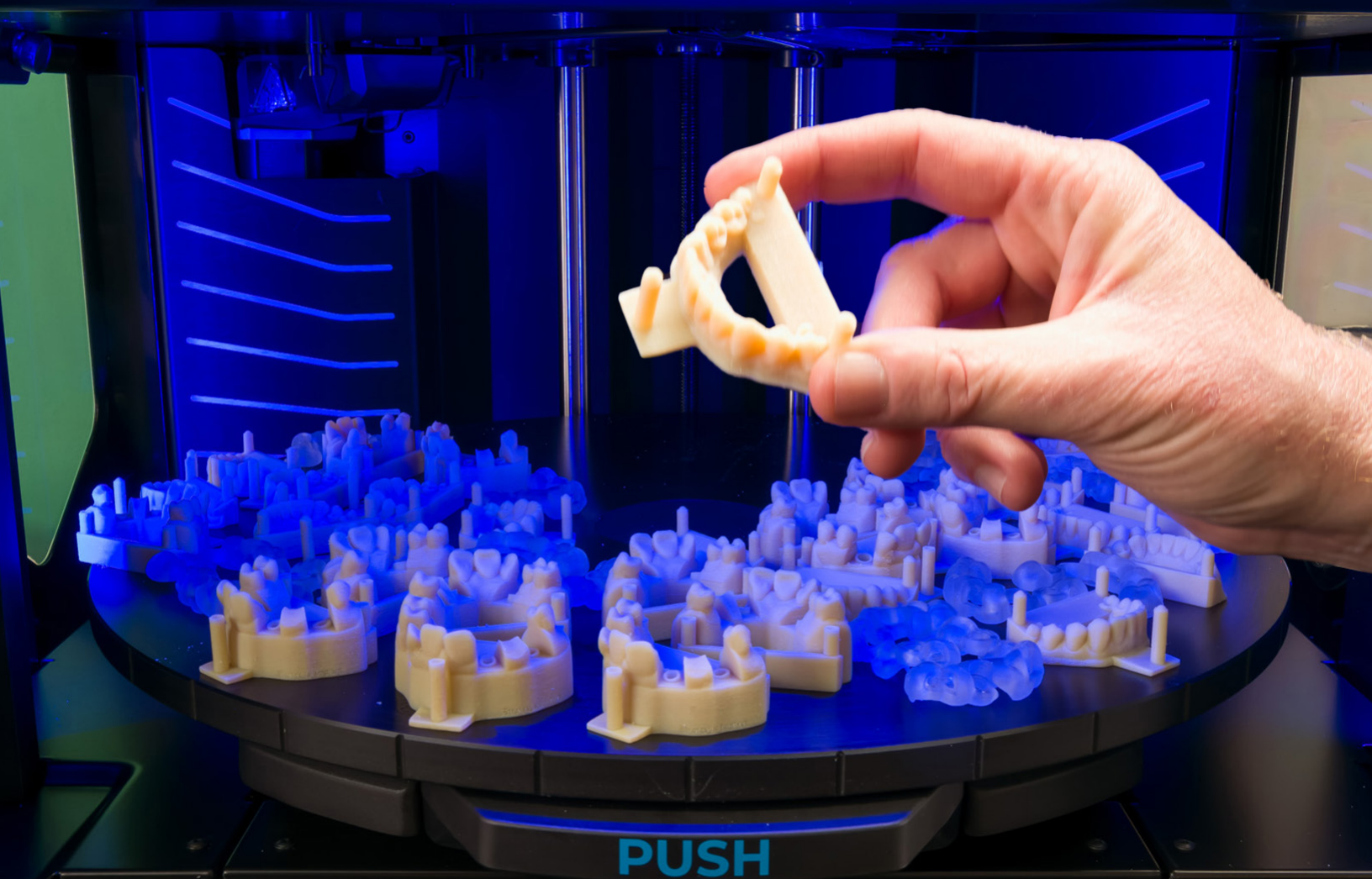
Is Vat 3D Printing Holding Your Dental Lab Back?

A Veteran Tech's Take On the Power of PolyJet Automation



By Adrienne Slevin

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Digital Dental Technician
Trainer





Executive Summary

Spending decades in dental labs, I've experienced the constant struggle to make parts more efficiently and affordably without losing any of the quality our doctors expect.

Of course, vat 3D printing works, but at the expense of valuable technician time, large amounts of inventory, and a process that is not always repeatable.

PolyJet™ multi-material 3D printing technology has changed this equation:

- **Cuts hands-on labor in half**
- **Produces up to 10X parts per build**
- **Prints multiple materials on a single tray**
- **Dramatically reduces inventory requirements**

Dental labs have always been challenged with dental technician shortages, tight deadlines, and exacting customer expectations. PolyJet isn't just an upgrade—it's a workflow transformation.

[Learn More](#) ▶





The Evolution of Dental 3D Printing

I started in the models department and worked my way through every aspect of restorative dental laboratory workflows.

I remember when zirconia was just an experiment - now it's standard. That's how quickly our industry evolves.

3D printing has followed a similar trajectory. What was once a novelty is now essential equipment in modern labs.

The challenge? Traditional dental 3D printers require hands-on attention at nearly every stage—nesting, printing, cleaning, curing—consuming valuable technician time that could be better spent elsewhere.

After decades in dental labs, I've seen it all - from mixing materials by hand to today's digital revolution.

One thing hasn't changed: labs are constantly under pressure to deliver quality products efficiently while keeping labor and overhead costs manageable.

Traditional dental 3D printers have served us well, but their labor-intensive workflows can be a real bottleneck and hindrance to producing the consistent products our clinicians need.

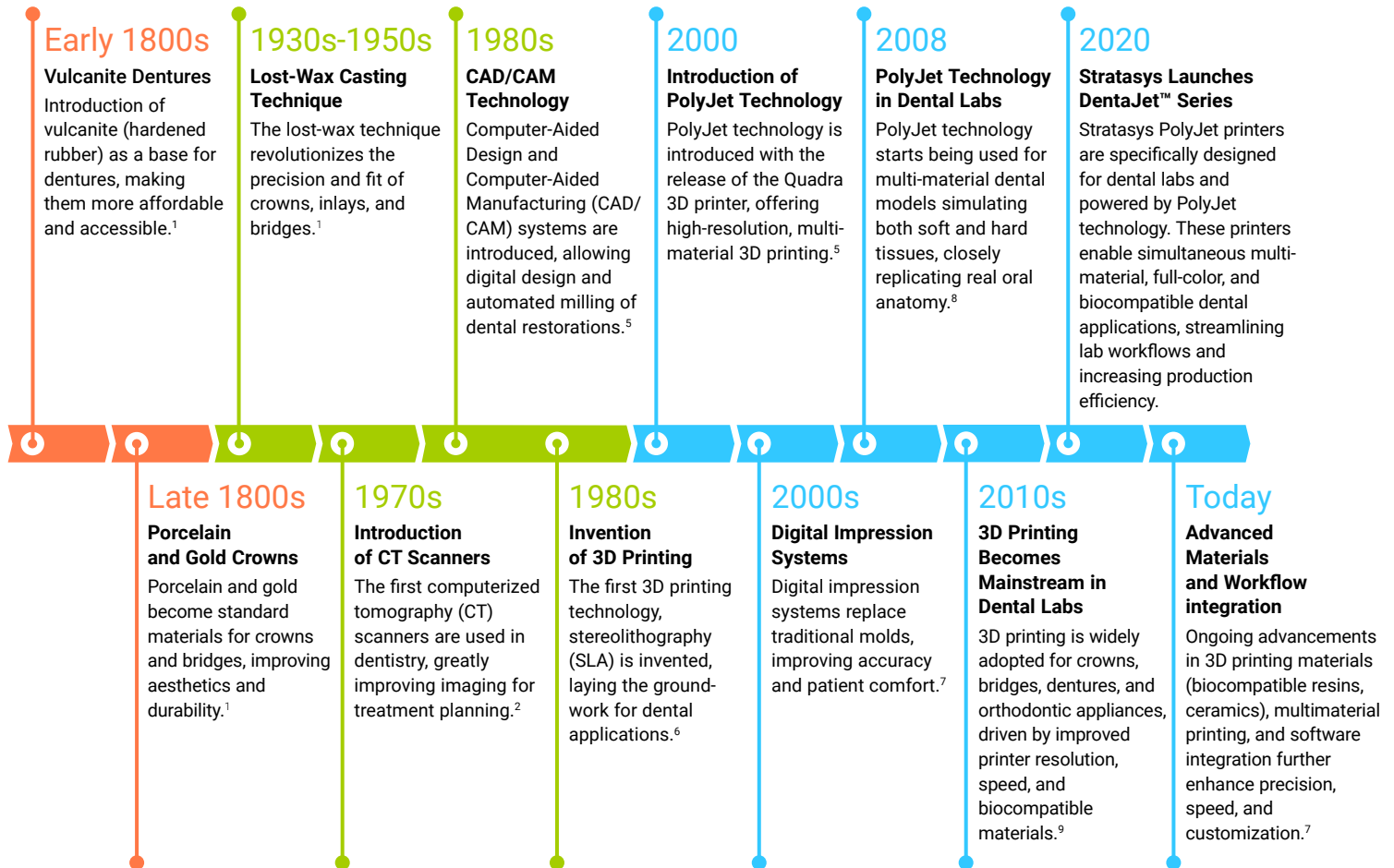


Traditional dental 3D printers require hands-on attention at nearly every stage...consuming valuable technician time that could be better spent elsewhere."





Timeline: Innovations in Dental Lab Technology



¹ <https://www.dentalproductsreport.com/view/the-list-a-timeline-of-dental-lab-technology>

² <https://www.linkedin.com/pulse/evolution-dental-lab-technology-from-handcrafting-oege/>

³ <https://www.summit-horizon.com/the-evolution-of-3d-printing-in-dental-labs>

⁴ <https://www.dentalproductsreport.com/view/the-list-a-timeline-of-dental-lab-technology>

⁵ <https://www.goengineer.com/blog/ultimate-guide-to-polyjet>

⁶ <https://www.dentalproductsreport.com/view/the-list-a-timeline-of-dental-lab-technology>

⁷ <https://chestnutdental.com/dental-technology/the-advancements-in-3d-printing-for-dental-applications/>

⁸ <https://www.objective3d.com.au/wp-content/uploads/2022/09/Dental-Assessment-Printing-Soft-Gum.pdf>

⁹ <https://unicorndenmart.com/the-evolution-of-dental-prosthetics-high-resolution-3d-printing-unveiled/>



Vat Printing:

Acceptable But Exhausting

Vat printing is what I started with around 17 years ago - it uses a digital projector to cure liquid resin layer by layer, creating detailed dental parts.

While it gives us acceptable accuracy, we need to spend countless hours doing the manual steps – nesting parts appropriately, mixing and filtering resin, filling and cleaning resin vats, removing parts from printers, cleaning parts in IPA baths, running multiple curing cycles, removing supports from parts and cleaning sticky raw resin from every surface in the print room. This cycle repeats over and over each day.



PolyJet:

Multiple Materials, Minimal Effort



PolyJet technology has changed 3D printing for labs - it's like having multiple printers in one, jetting micro-droplets of resin that are cured immediately with UV light, allowing us to print different materials on the same tray, simultaneously.

Because its gel-like support material is fully encapsulating, the parts come out of the printer with incredible detail and repeatability – and the support washes off with water, no IPA needed!

As a result, PolyJet printing is almost completely free of manual processes from nesting through the ready to use parts.



Why I'm Excited About PolyJet

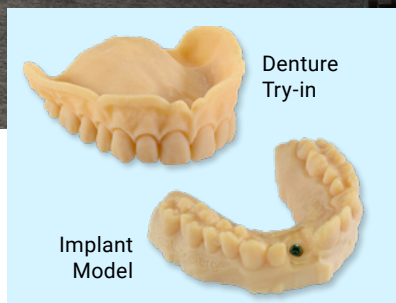
That's why I'm excited about what Stratasys DentaJet printers bring to the table – **automated processes that dramatically reduce hands-on time while enabling multiple-material printing on a single tray.**

PolyJet technology represents something I wish I'd had years ago: Quick and easy prints that come out ready to use. This versatility frees our skilled technicians to focus on the creative, high-value work that requires their expertise rather than babysitting printers.

Let me walk you through a detailed comparison that shows exactly how PolyJet technology can drastically improve your lab's productivity.



Quick and easy prints that come out ready to use."



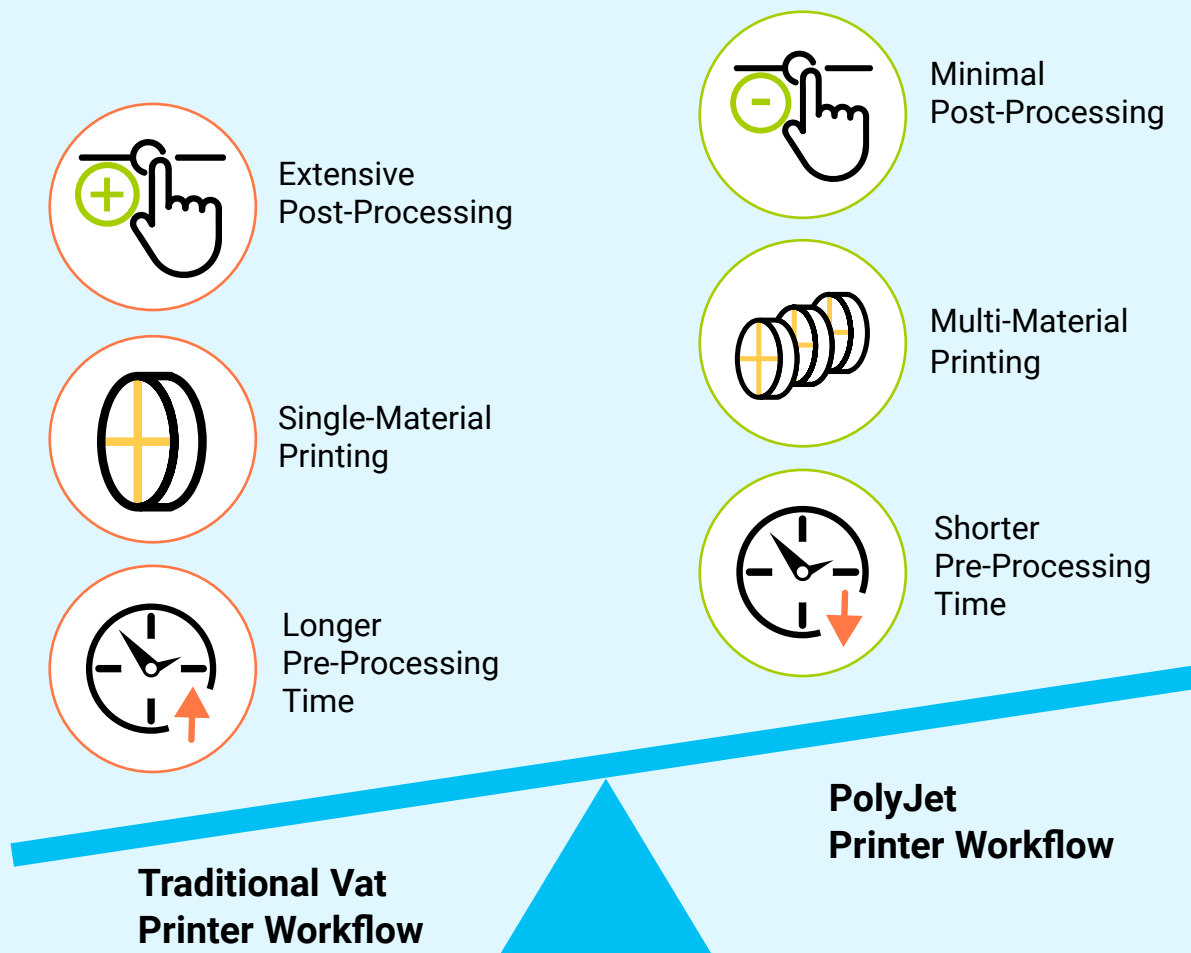


Workflow Comparison:

Traditional Vat Printing vs PolyJet

Having managed large lab organizations and trained over 80 laboratories, it's clear that workflow inefficiencies can make or break profitability. Let's break down the real differences:

PolyJet Workflow Offers Efficiency and Versatility





Traditional Vat Printer Workflow

- **Pre-Processing:** Manual nesting eats up about 10 minutes per build depending on the software and requirements for the type of material and part.
- **Printing:** You're limited to single-material trays and need multiple builds for different materials or shades.
- **Post-Processing:** This is where time disappears - IPA rinses (5-10 minutes), curing cycles (6-30 minutes), support removal and recontouring parts (5-15 minutes)—totaling 40+ minutes of hands-on labor per build.¹

PolyJet Printer Workflow

- **Pre-Processing:** GrabCAD Print software automatically nests your parts in just 2 minutes.^{2,3} (no manual orientation or checking slices)
- **Printing:** 9 different indications can be printed simultaneously on one tray. For example: models, custom trays, surgical guides, and gingiva masks, castable patterns, all at once on the same tray.³
- **Post-Processing:** Parts come out fully cured and ready to use after using water in the parts washer - no additional steps or chemicals required - totaling just 19 minutes of manual labor per build.⁴

STEP 1: NEST



Automated nesting and support placement

STEP 2: PRINT



Unattended printing, immediate cure upon print

STEP 3: WASH



Automated support removal, no IPA, no additional curing



Sample Workflow Comparison

Traditional Vat Workflow		PolyJet Workflow	
1 Build: Crown & Bridge Models	Lab Tech Manual Task Time (minutes)	1 Build: Crown & Bridge Models & Surgical Guides	Lab Tech Manual Task Time (minutes)
Manual Nest	10	Automated Nest	2
Shake Resin/Fill Tank	3	-	-
Start Printer	1	Start Printer	1
Remove Parts	5	Remove Parts	5
Clean Build Head & Replace	5	Clean Build Head	5
IPA #1	5	-	-
-	-	Place In & Remove From Automated Wash (1 min each x 6 cycles)	6
IPA #2, Remove & Dry	5	-	-
Cure #1	3	-	-
Flip, Cool, & Cure #2	3	-	-
TOTAL MANUAL TASK TIME	40 minutes	TOTAL MANUAL TASK TIME	19 minutes
OUTPUT	7 parts	OUTPUT	70 parts



Time Savings and Efficiency Gains

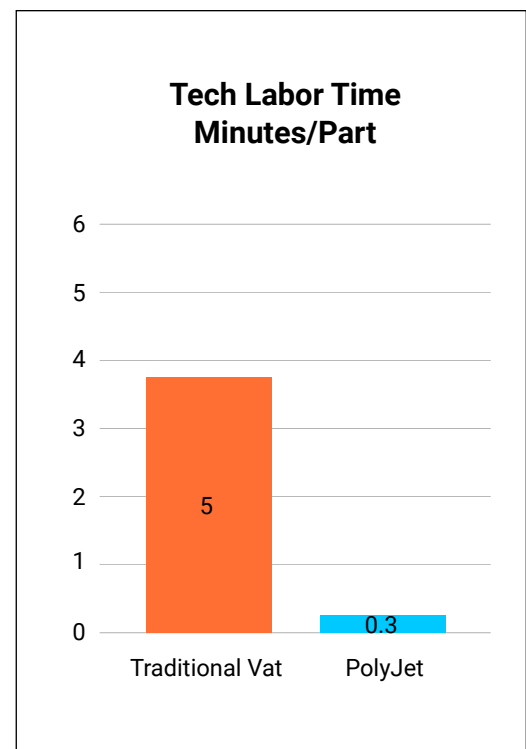
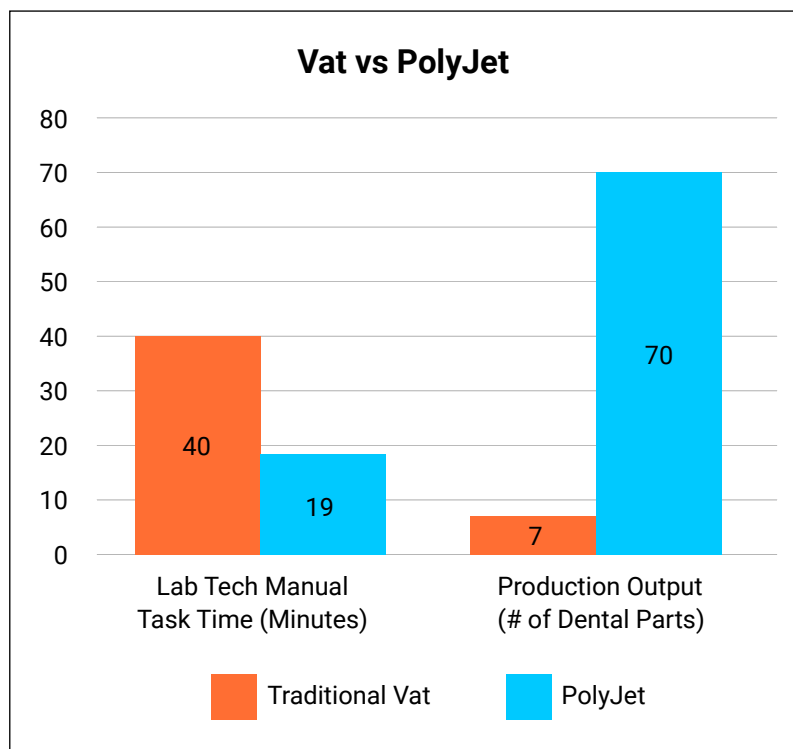
Here's my perspective:

When you run vat based 3D printers, someone needs to be there monitoring pre-processing and post-processing, with each batch yielding only several parts at a time. With PolyJet, you can set up a build before leaving for the day and return the next morning to 70 completed, consistently accurate parts - a 10X increase in output with less than half the hands-on time!^{2 3 5}

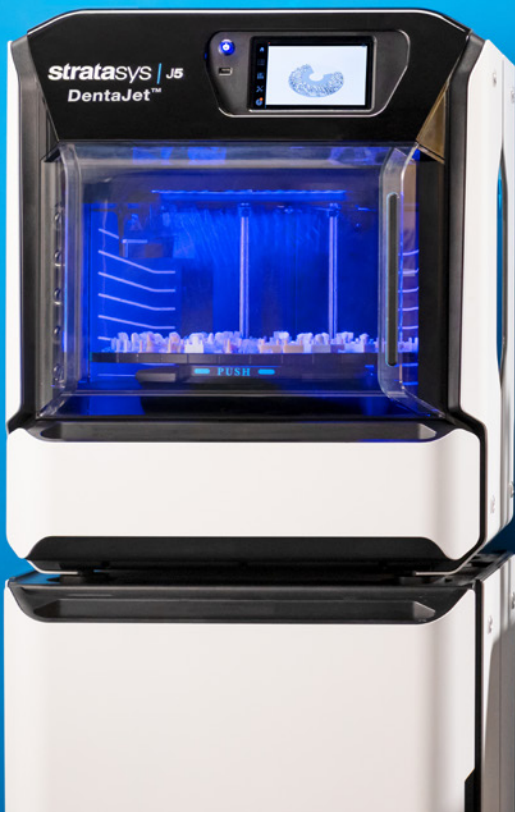
The math is simple: PolyJet frees up nearly half of a technician's day compared to traditional 3D printing workflows. That's time they can spend on tasks that fit their skillset in the laboratory.

With the support material that encapsulates PolyJet parts, you will see better fitting parts on the global surface, meaning you get better geometries for die fits, analogs and other implant components and improved detail on downward facing surfaces that were otherwise washed out or distorted with other types of technology. This will result in fewer remakes, better fitting parts and higher quality - all with less labor.

Another detail that is important is raw resin handling. It's not safe, it's messy, and there's a risk of cross-part contamination from non-biocompatible parts to biocompatible parts.



PolyJet frees up nearly half of a technician's day compared to traditional 3D printing workflows."



3 Key Benefits of PolyJet For Dental Labs

1. **Reduced Manual Labor:** Techs spend less time on repetitive tasks like nesting, post processing, and support recontouring - and trust me, they'll thank you for it.³
2. **Multi-Material Printing:** Produce all of your parts in one tray without switching materials or build styles and without post processing steps. This is a game-changer. I wish DentaJet was around in my production days.
3. **Streamlined Workflow:** Automation allows your lab to scale production efficiently while maintaining the high-quality results that clinicians must have.^{1 2}

While training and consulting for both laboratories and dental offices, I've seen how bridging technology between labs and clinics creates better outcomes. When your lab can turn work around faster with consistent quality, everyone benefits – the laboratory, the practitioner, and ultimately the patient.



When your lab can turn work around faster with consistent quality, everyone benefits."



Making the Transition:

Addressing Your Concerns

After training dozens of labs in their transition from vat printing to PolyJet technology, I've heard all the concerns. Let me address the most common ones:

"The upfront cost seems high. How long until I see ROI?"

While PolyJet systems have a higher initial investment, most labs see ROI (Return on Investment) within 12-18 months through labor and material savings and increased throughput and quality. One lab I worked with recovered their costs in only 10 months by redirecting technician time to higher-value services.

"Will my team need extensive training?"

The learning curve is surprisingly gentle. Technicians generally learn GrabCAD in less than 30 minutes and printer operation and part handling in a couple hours. The training is performed by a certified dental technician on the Stratasys team.

"What about maintenance requirements?"

PolyJet printers need regular but simple maintenance. It is actually less demanding than properly maintaining vat printing systems when you account for all the resin handling and cleaning involved.

"Do I need special certification?"

No special certification is required to operate PolyJet technology. Stratasys provides comprehensive training materials and support along with an expert team to help labs navigate the implementation process.

"What if something goes wrong?"

Stratasys offers robust support packages with remote diagnostics and same-day response. Our support team is exceptionally responsive - you will be in good hands!

Remember, I started exactly where you are now - skeptical of another "revolutionary" technology with a hefty investment. I've stood in print rooms for countless hours, sticky with resin, wondering if there was a better way.

Having now implemented PolyJet in over 80 labs, I've seen firsthand how it transforms businesses - not just through numbers on a spreadsheet, but through happier technicians, expanded service offerings, and owners who finally have time to grow their business instead of babysitting printers. This isn't just an upgrade; it's freedom from the workflow that's holding your lab back.



“ We're really blown away by the throughput of the J5 DentaJet printer.”

Tra' Chambers
Express Dental
Laboratory

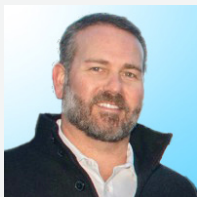


“ I have not seen a comparable technology on the market. Precision printing and no post-processing guarantees excellent patient fit, high standard of care, and reduced chair time.”

Michael Anger
MA CAD/CAM Dental Lab

“ We don't have to babysit the printer or swap materials. We simply load the tray and walk away.”

Joe Barrett
Dental Designs

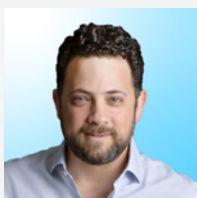
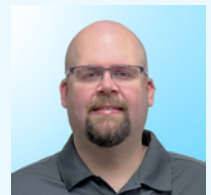


“ Since we began leveraging Stratasys 3D printing technology, we've experienced faster turnarounds, better capabilities and a vibrant, growing business.”

James Bonham
Specialty Appliances Orthodontic Laboratory

“ What I love about Stratasys is that they are always there to support us whenever we need.”

James Dobson
Dobson
Ortho Labs



“ The J3 DentaJet enabled us to access the most advanced printing technology, packaged in a small footprint with a large print capacity.”

Ilan Sapir
Glidewell Dental

“ I can print 35-40 different appliances simultaneously, with up to 5 different materials, and know that each one is going to be perfect in the morning when we come back into the office. Having 40 different jobs finished simultaneously and knowing that they are all precise is a huge advantage.”

Bret Royal
Implant Concierge





Conclusion

A PolyJet printer isn't just another piece of equipment - it's a fundamental workflow transformation. Labs deal with technician shortages, tight margins, and inconsistent result. This technology directly addresses all these challenges by automating processes while delivering the precision we must have in dental applications.

I remember cutting out dies with a handsaw, hand waxing crowns and watching each technological improvement change our lab and industry. PolyJet technology is one of those pivotal moments.

If you'd like to evaluate the difference DentaJet technology will make in your own workflows, reach out today. I'd be happy to schedule a demonstration or share additional resources based on my experience implementing this technology across dozens of labs.



PolyJet technology is one of those pivotal moments."

[Learn more about DentaJet](#) ▶

[Watch how DentaJet works](#) ▶



About the Author

Adrienne Slevin has worked in, managed, and digitized full-service dental labs over her 20+ year career before becoming Stratasys' Global Dental Sales Enablement Lead. A master of both traditional techniques and digital workflows across multiple CAD platforms, she has trained over 80 laboratories and 30 dental offices on technology that saves time and improves outcomes for technicians, practitioners, and patients alike.

This whitepaper combines technical data with practical insights from my extensive experience training dental lab professionals across North America. Citations from third-party sources provide additional validation for the workflow improvements and efficiency gains described.

¹ <https://www.pionext3d.com/news-detail/3d-printing-technology-for-dental-dlp-sla>

² <https://www.youtube.com/watch?v=aMEiq36RhLo> (GoEngineer)

³ <https://production-to-go.com/en/manufacturers/stratasys/j3-dentajet/uebersicht>

⁴ <https://www.sys-uk.com/wp-content/uploads/2023/03/SYS-Stratasys-J3-Dentajet.pdf>

⁵ <https://www.goengineer.com/3d-printing/polyjet/stratasys-j5-dentajet>



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