



CASE STUDY
MEDICAL

Optimizing Point-of-Care Diagnostics Through **Faster Design, Testing, and Validation**

How Picodya Uses a Multi-Technology
Stratasys Additive Manufacturing
Workflow to Turn Ideas into Functional,
Biologically Tested Prototypes in Days —
And Sometimes Hours

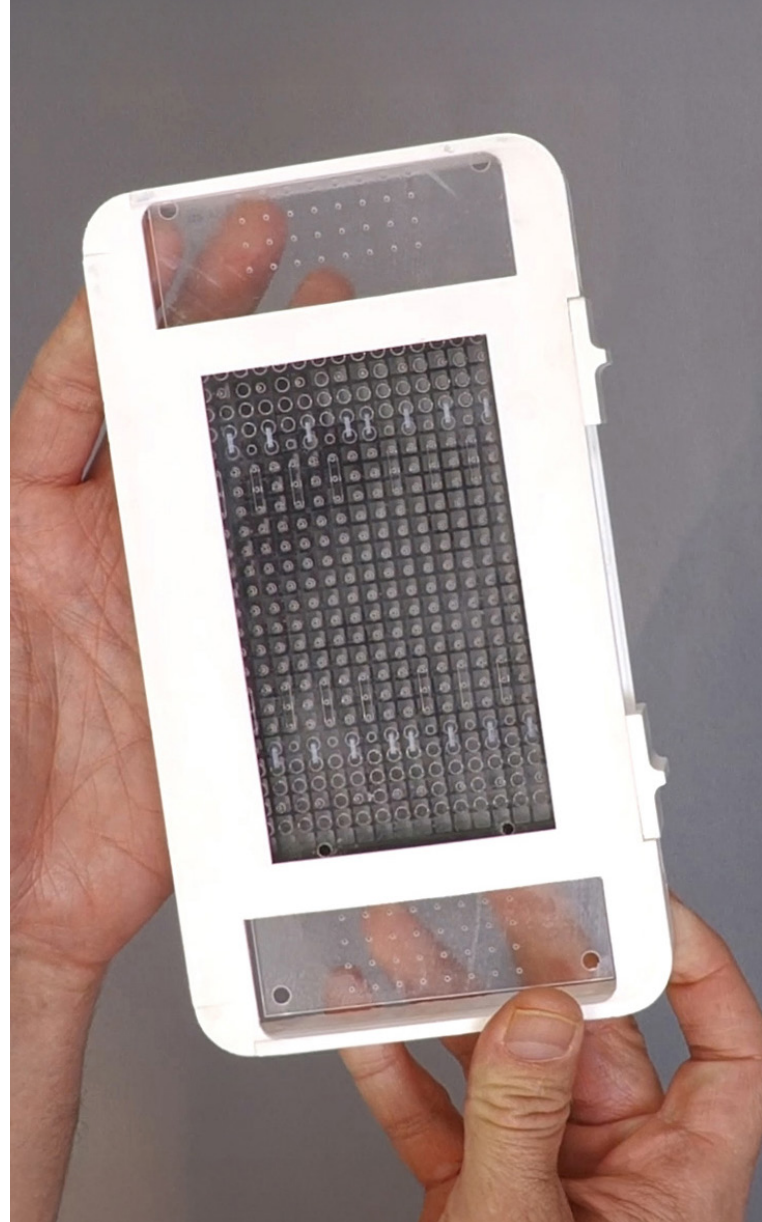




Customer Overview

Picodya is a medical technology company that develops hybrid, multiplexed platforms for point-of-care diagnostics and research. Its approach automates and scales down laboratory processes for liquid handling and biological assays so complex testing can be done in as little as 15 minutes.

For this to happen, mechanics, fluid handling, electronics, disposable cassettes, custom assay plates, seals, and biological materials all have to work together. For a startup, every hardware decision can affect not only fit and function, but also the pace and cost of the next biological experiment.



The Challenge

Keeping complex diagnostic development moving

- Supplier lead times of weeks to months
- High prototyping costs
- Uncertainty around optimal sealing surfaces and geometry
- Interdependent rigid, fluid-handling and elastomeric parts
- Startup pressure to iterate quickly with limited resources

The Solution

A rapid multi-technology 3D printing workflow

- Design-print-test loops measured in days and sometimes hours
- Rapid design-print-test workflows that support continuous iteration
- PolyJet® for precision prototypes, microfluidic components, machine parts, fixtures, and functional testing
- Origin® P3™ DLP with MED Silicone 25A for thin silicone membranes and sealing components

The Impact

Faster design iteration, lower cost, greater agility

- Roughly two years of accumulated development time saved
- Some small complex parts reduced from tens or hundreds of dollars to a few dollars
- Faster recovery from experimental failures
- Rapid proof of concept before investing in complex designs and serial production



The Challenge:

Keeping Complex Diagnostic Development Moving

In a multidisciplinary diagnostic platform, a small mechanical problem can quickly become a biological-development problem. A cassette that does not close consistently can compromise a seal. A flexible mechanism can disrupt fluid movement. A change to a disposable can alter how an assay is run. Each issue must be built, integrated, tested, and validated before the team can confidently move forward.

During Picodya's early development, the priority was reaching a minimum viable product and establishing proof of concept. As the platform matured, the team needed to optimize performance while working within the time, budget, and staffing constraints typical of a startup. That made the speed of design iteration and validation just as important as the speed of manufacturing.

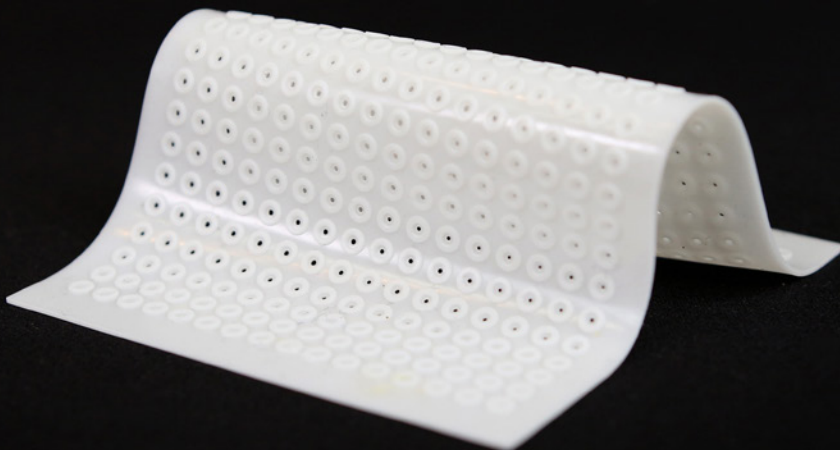
With conventional manufacturing, even a small custom part could take days to weeks, while standard machining or tooling could stretch into months. Multiplied across repeated design cycles, Amir Marcus, VP Engineering at Picodya estimates the accumulated delay would have added years to development.

"If we had to do everything that we did with conventional manufacturing, it would have taken years," says Marcus.

The team needed a development workflow that could keep several different requirements moving at the same time:

- Tight-tolerance and watertight parts for wet applications
- Durable structural and user-handled components
- Disposable components that contact biological materials, including proteins
- Jigs and fixtures that make assembly and testing more repeatable
- Custom assay plates and cassette components
- Flexible silicone gaskets and sealing elements

No single general-purpose prototyping process could cover all of those needs. Picodya needed complementary technologies and materials that could support rigid mechanical development, sealing, and application-specific biological testing without sending every iteration to an outside supplier.



“

What previously could take up to two months can now be completed in a matter of days. That speed has a direct impact on development efficiency and cost.”



Amir Marcus
VP Engineering at Picodya



The Solution:

A Rapid, Multi-Technology Design-Print-Test Workflow

Picodya uses Stratasys PolyJet™ and Origin P3™ DLP technologies as complementary development tools. Rather than waiting for one “perfect” design, engineers can print a concept, test it in the system, learn from the result, and revise it quickly — often within days and, for smaller parts, sometimes within hours.

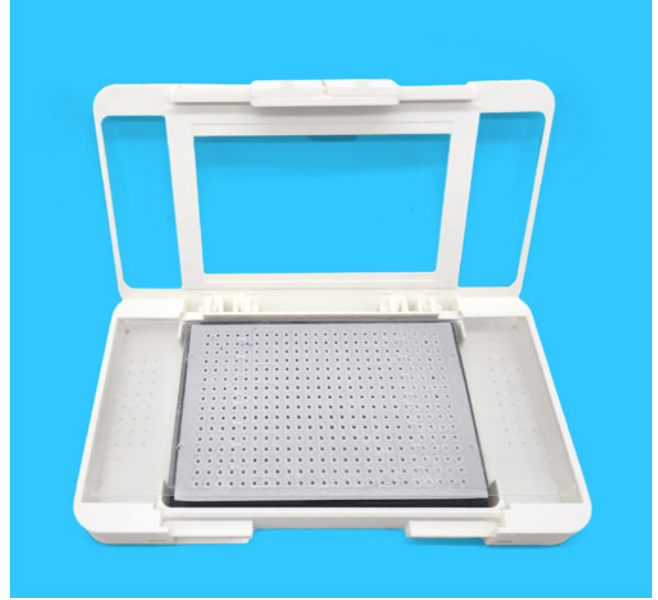
PolyJet for Precision Parts, Jigs, and Functional Iteration

PolyJet supports tight-tolerance machine parts, wet-application components, cassette elements, custom plates, jigs, fixtures, and other parts surrounding Picodya’s fluid-handling architecture. That lets the team evaluate fit, sealing, handling, and mechanical integration in the actual development system.

Picodya also uses GrabCAD Print Pro, allowing the team to print features directly onto functional films positioned on the build tray and evaluate precisely registered component concepts without a separate tooling cycle.

The value of that rapid, in-house workflow becomes especially clear when an unexpected mechanical issue threatens to disrupt testing. In one case, researchers were not always seating a slide in exactly the right position, which could prevent a proper seal and cause experiments to fail. Marcus improvised a spring-loaded insertion tool using a small printed fixture, a pin, and even a spring taken from a pen on his desk. The tool made correct insertion repeatable and helped prevent the loss of expensive biological material.

ToughONE™ material played a key role in developing cassette housing concepts and other user-handled components that required durability and dimensional accuracy. Because these parts are repeatedly assembled, tested, and handled throughout development, ToughONE gave the team a faster way to evaluate fit, functionality, and user interaction while continuing rapid design iterations.



Origin P3 DLP for Silicone Seal Development

For sealing elements, Picodya uses MED Silicone 25A printed on the Origin P3™ DLP system to iterate thin gasket geometries during proof-of-design work. Instead of committing immediately to a mold, the team can test different seal designs alongside the surrounding rigid cassette and plate components, then use the results to narrow the design before tooling. Picodya can revise rigid parts and elastomeric elements in parallel, assemble them, and evaluate fit, sealing, and system performance together.

“It’s not about being perfect, but testing the results,” Marcus says. “You can test a lot of different ideas.”

Testing Printed Parts with Biological Assays

Some Picodya disposables and wetted parts come into direct contact with biological materials, including proteins. For those applications, a mechanically successful prototype is only useful if it can also support the assay behavior the team needs.

In an application-specific internal evaluation, Picodya ran protein-based biological assays in 3D printed custom plates and compared the results. The tests indicated that the printed plates were suitable for Picodya’s development needs, giving the team a way to evaluate geometry and biological performance before investing in production molds. The result is not a general biocompatibility certification, but it gives Picodya useful evidence for its own assay-development decisions.

Together, PolyJet and Origin P3 DLP shorten the feedback loop between mechanical design, sealing, fluid handling, and biological testing helping Picodya move more quickly from design changes to meaningful system-level validation.

“Design it, print it, test it, see the results, and change it,” Marcus says. “The turnaround time changes everything.”



The Impact:

Turning Months of Waiting into Faster Design Iteration

Bringing additive manufacturing into the development workflow has substantially reduced the time between an idea and a functional test.

Parts that might otherwise require weeks or up to two months to manufacture can now be produced in days, and some small iterations can be completed within hours.

"What previously could take up to two months can now be completed in a matter of days," says Marcus. "That speed has a direct impact on development efficiency and cost."

That speed lets the team test more alternatives, respond quickly when experiments expose a mechanical issue, and keep proof-of-concept, proof-of-design, biological optimization, and functional validation moving without waiting for the next external manufacturing cycle.

Lower Cost per Design Iteration

The cost advantage can be especially significant for small, complex parts. Marcus notes that a small component requiring multi-axis matching might cost tens to hundreds of dollars conventionally, while a printed version can cost only a few dollars.

In one case, Picodya redesigned an overly flexible mechanism by replacing part of the assembly with two small, printed components costing roughly \$10. The change solved the mechanical problem quickly and allowed experiments to continue without the expense and delay of a conventional manufacturing cycle.

More Control and More Room to Experiment

For a startup, rapid printing changes how decisions get made. Engineers do not have to wait until every idea is fully optimized before testing it. That makes it practical to explore new concepts, including ideas from biologists and other team members who are not mechanical designers.

The result is a more continuous development rhythm: design, print, iterate, test, refine. Rigid cassette elements, machine parts, fixtures, custom plates, and seals can be updated as the team learns instead of being bundled into infrequent supplier-driven revision cycles.

Fewer Failed Experiments from Mechanical Issues

The cassette-insertion fixture illustrates the system-level payoff. Before the tool, an incorrectly seated slide could break the seal and waste a biological run. With a quickly printed fixture guiding the insertion, the team removed a source of operator variability and protected both experimental time and expensive biological materials.

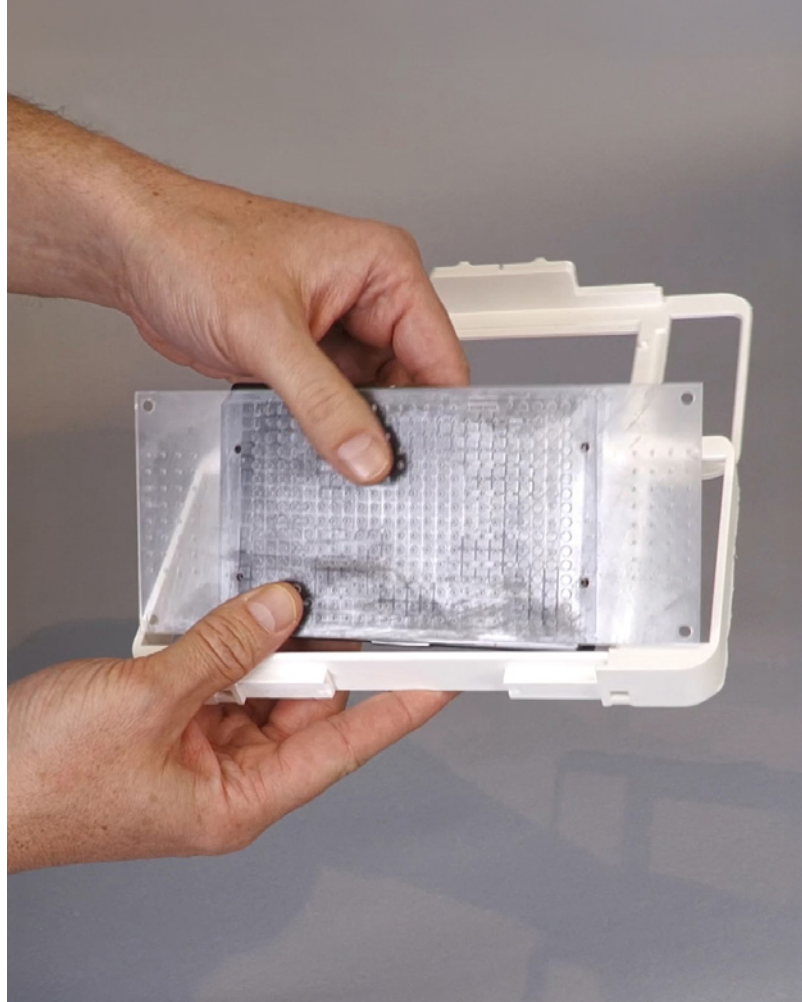
For Picodya, that is where additive manufacturing has the greatest impact: a mechanical fix can be implemented quickly enough to keep biological development moving instead of becoming a bottleneck.

Looking Ahead:

Supporting the Next Stage of Picodya's Growth

As Picodya advances its research platform and pursues relationships with strategic partners, the ability to mature hardware quickly becomes increasingly important. The team can resolve integration issues, prove design directions, and build evidence around assay performance before making larger commitments to tooling or external manufacturing.

Stratasys additive manufacturing gives Picodya a practical bridge from concept to a more mature, partner-ready system. By shortening the cycle between engineering changes and real functional testing, the workflow helps the company move forward with more information, less wasted experimental effort, and greater flexibility as the platform evolves.



Discover how Stratasys technologies can help medical device and diagnostics teams shorten design cycles, validate functional components, and evaluate parts before committing to production tooling.

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