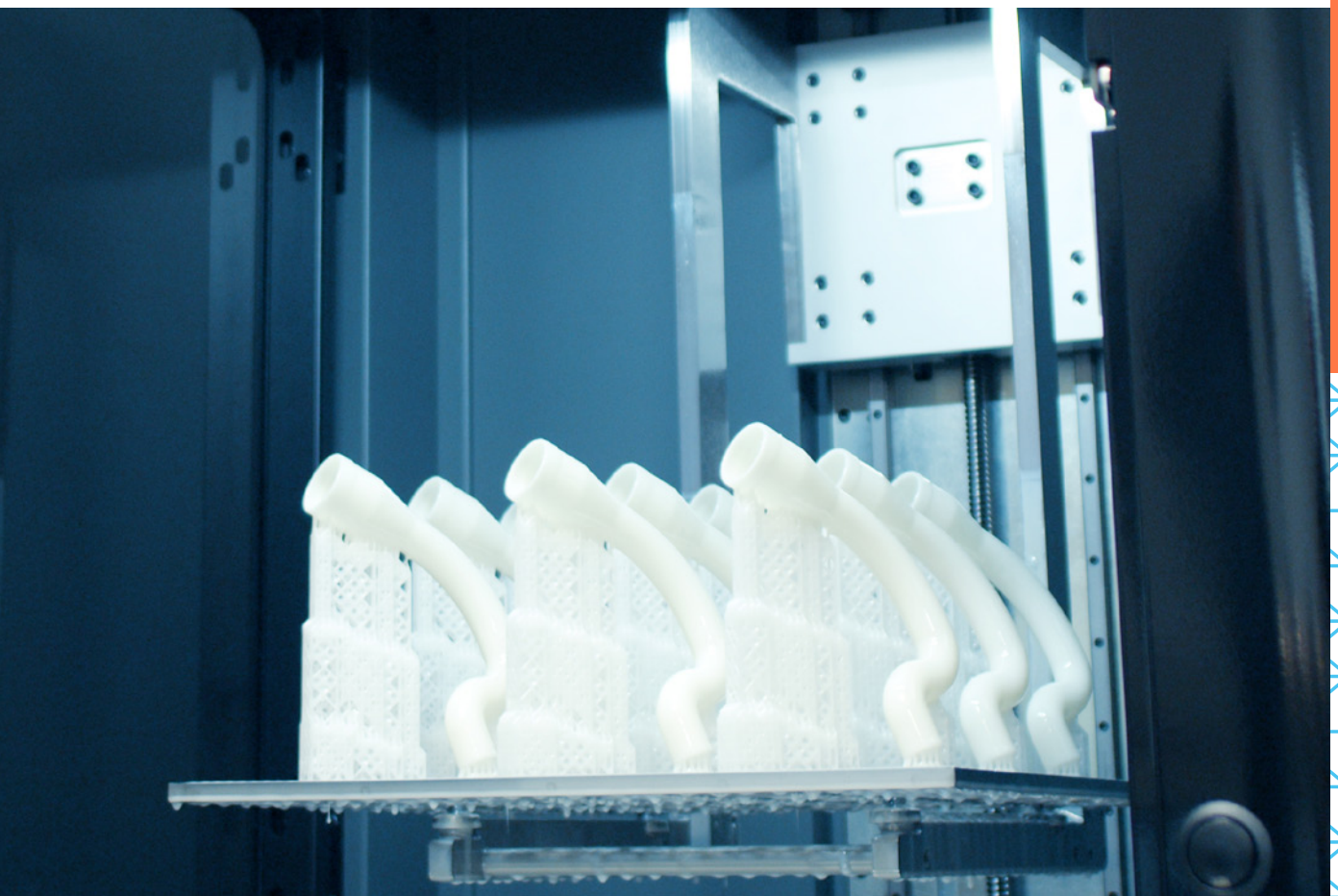
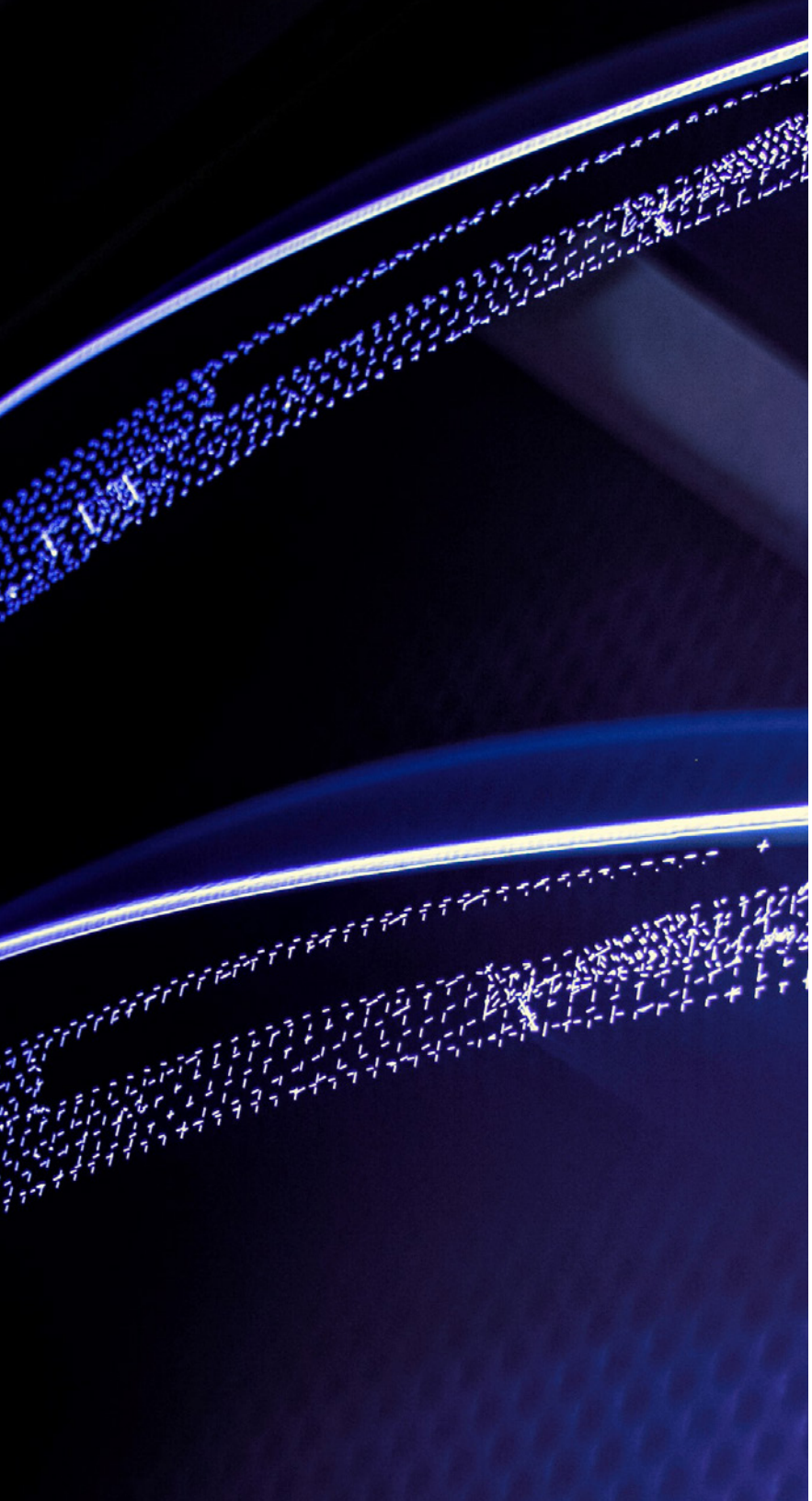
stratasys

E-BOOK
SLA

Peace-of-Mind
Stereolithography
3D Printing





The Evolution of Stereolithography 3D Printing

Stereolithography (or SLA) is one of the industry's most established 3D printer technologies. An alternative to traditional methods of manufacturing for prototyping, tooling and master patterns, stereolithography technology is renowned for producing accurate, detailed parts with smooth sidewall quality. Due to the ease and speed to iterate designs and print, along with a wide range of materials to use suit specific applications, stereolithography continues to be the go-to 3D printer for designers and engineers.

Stereolithography is considered a proven technology since the 1980s. However, over the ensuing decades, reliability and productivity issues of aging SLA systems were becoming problematic and required improvement. Users were demanding a system that focused on:

- Print quality
- Reliability
- Uptime

A small group of engineers saw this need for improvement and identified a gap in the market, and a new generation of stereolithography printer technology was born: the Neo®.

Neo® Stereolithography - Designed by Engineers for Engineers

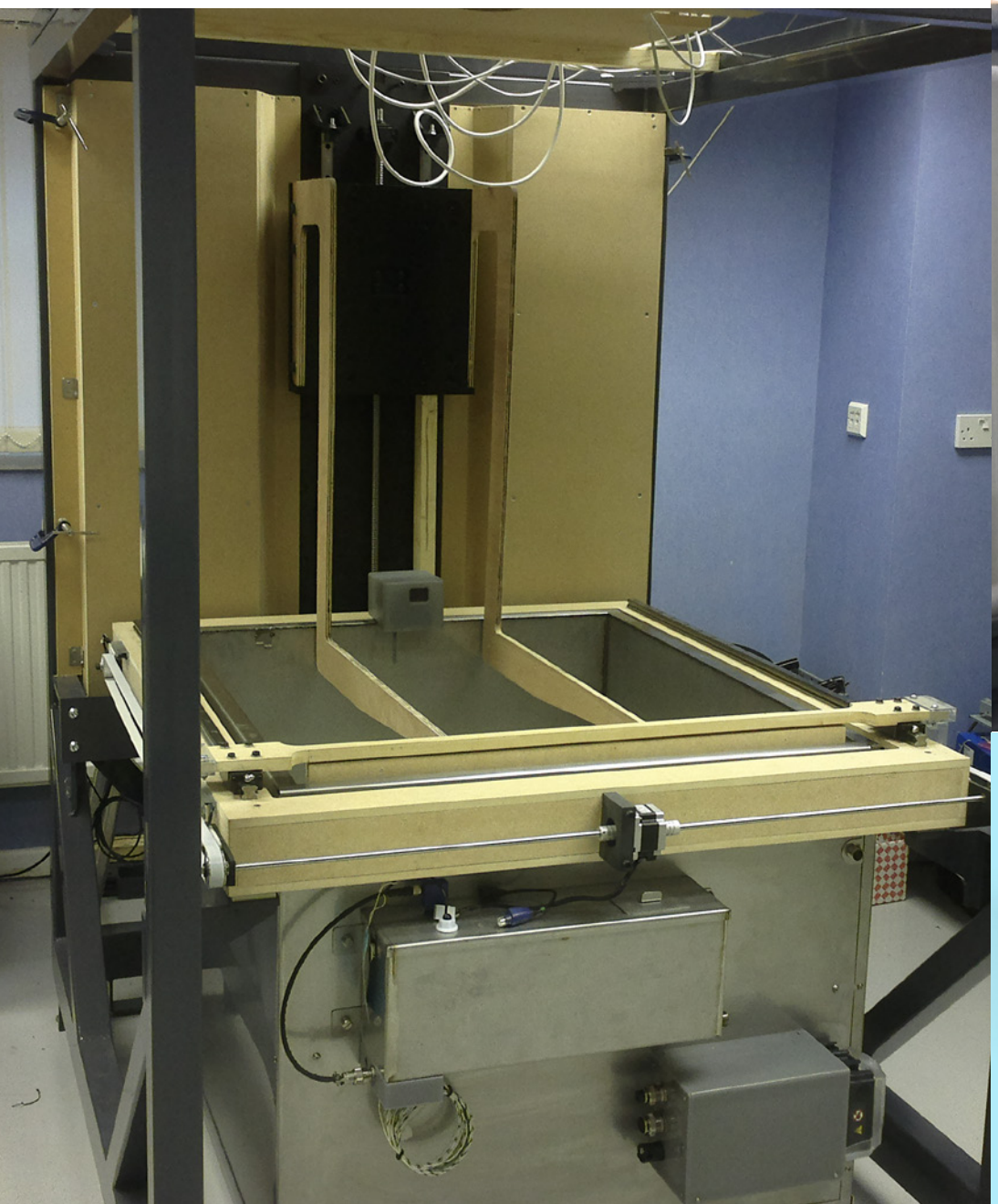
The Neo was designed by frontline engineers who serviced, and supported customers with legacy SLA 3D printers. While servicing these printers in the field, they listened to customers' frustrations and identified the limitations of existing hardware in the market. This deep understanding of the technology, coupled with their unique customer insight inspired the development and manufacture of the Neo as next-generation stereolithography 3D printer technology.

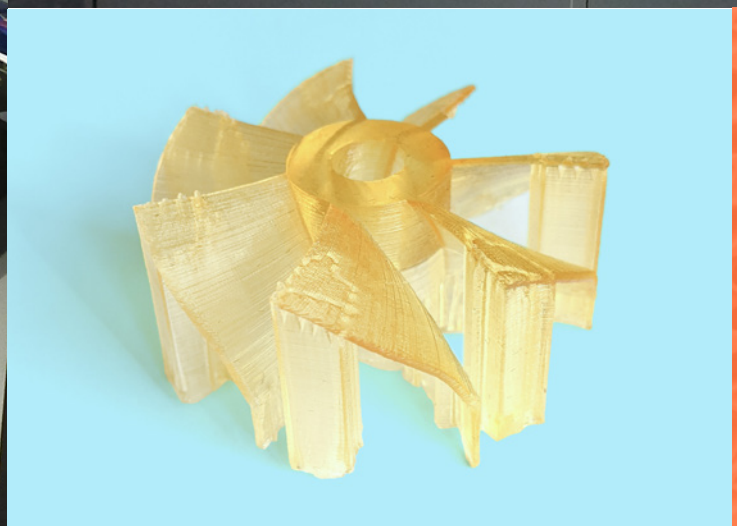
The core principles driving the development of the Neo were:

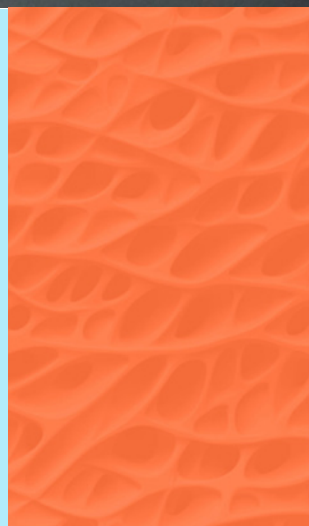
- A simple design combined with the best components resulting in excellent reliability
- Outstanding part production with industry-leading sidewall quality.
- Excellent software functionality including part traceability and reporting function with easy to use interface.

In this eBook, you'll learn more about the driving factors that led the Neo's engineers to develop next generation stereolithography.

First Neo Prototypes







Laser and Optics

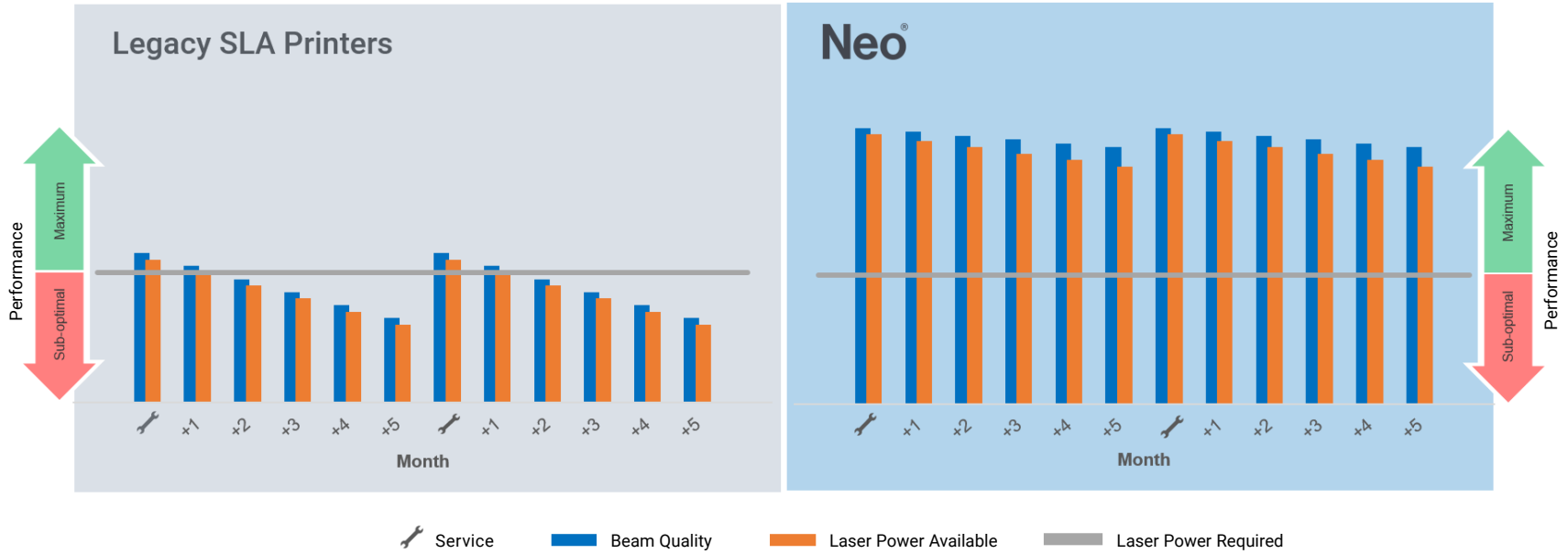
Service engineers in the field identified that legacy SLA printers had insufficient laser power capacity to support optimum build speeds at all times between services. The lasers required frequent maintenance and replacements, frustrating users with excessive system downtime.

The Neo was developed with a 2-Watt laser with dynamic and variable beam size options. The Neo has advanced laser controls and quality optics that minimize power degradation and service visits.

This combination of dramatic increase in laser power, and advanced control resulted in:

- ✓ 1.5 to 3 times faster print speed and throughput
- ✓ 1.5 to 3 times greater revenue generation for service bureaus
- ✓ Highly accurate parts with superior surface quality without sacrificing print speed and build volume

Beam Quality & Laser Power Between Preventative Maintenance Service



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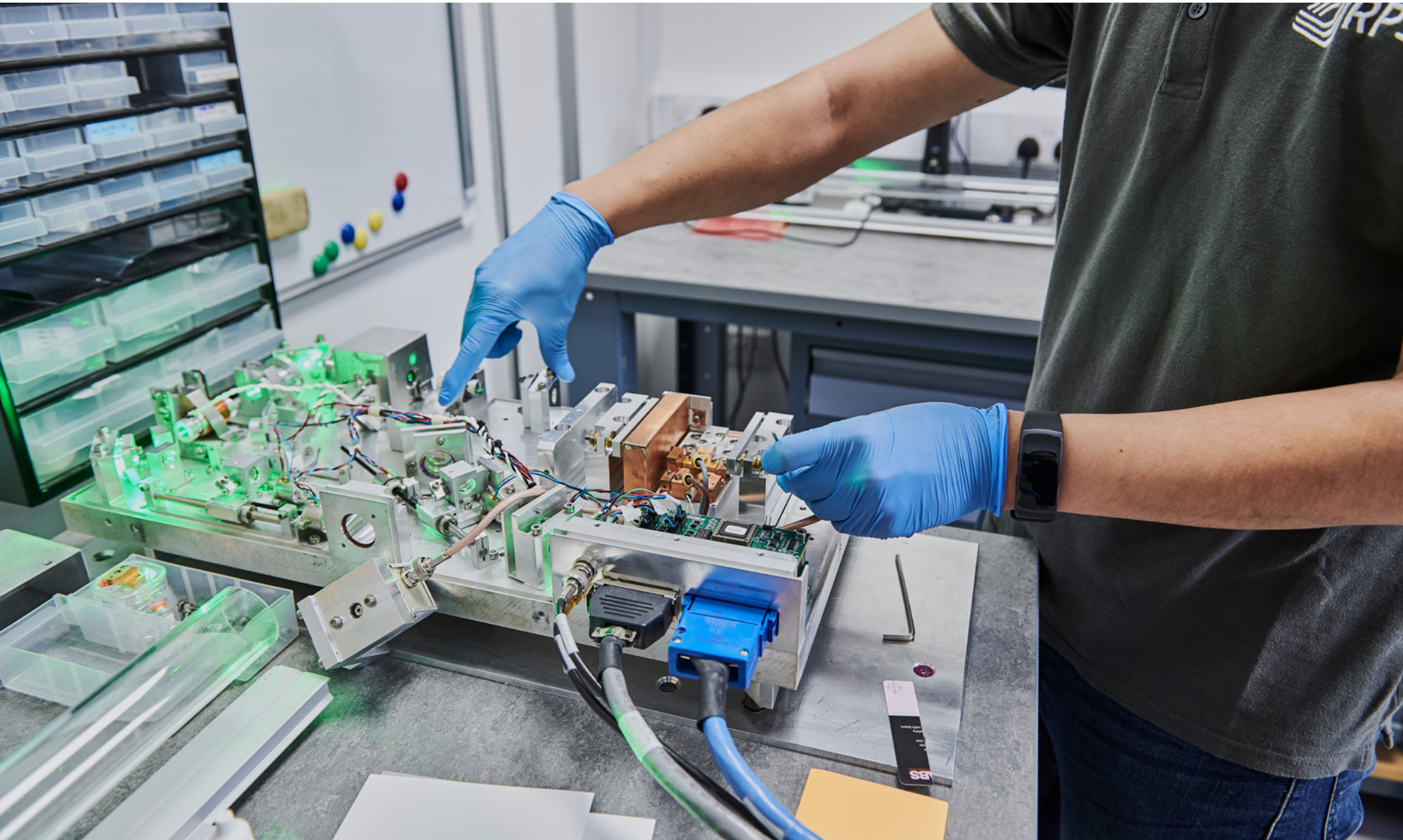


Recoater Blade

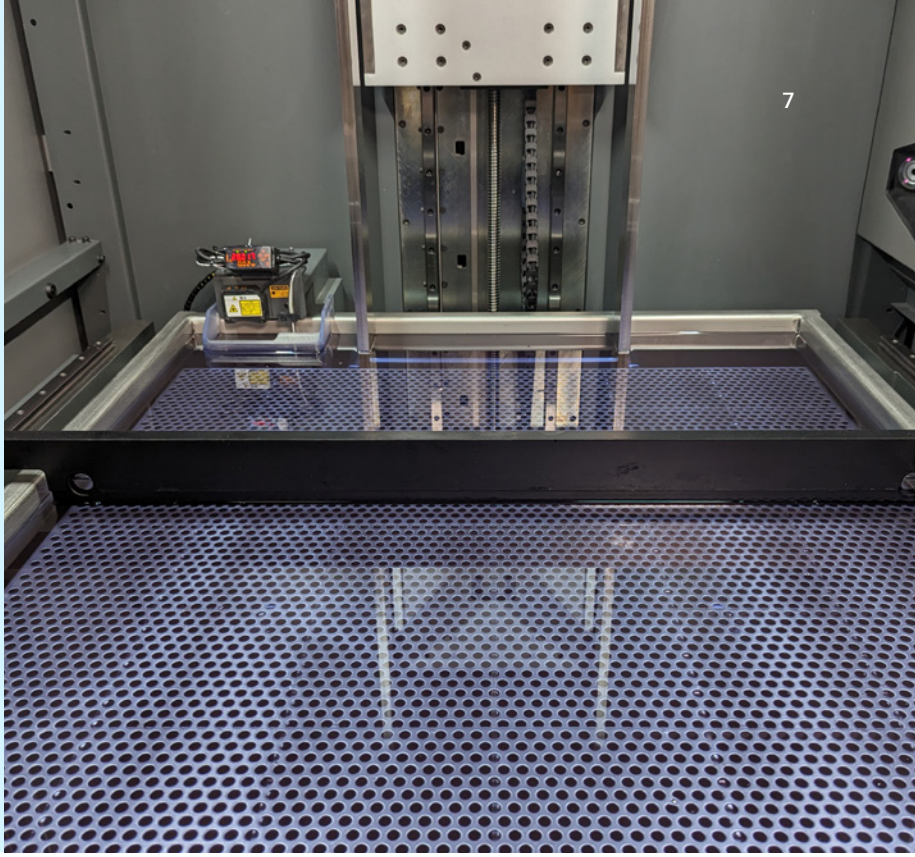
The recoater design of legacy SLA systems is a source of many issues resulting in “build crashes” and therefore wasted material costs, down time and missed deadlines. Following a “build crash” on these 3D printers, typically a costly service technician visit was usually required to carry out a blade gap adjustment, with each service visit costing up to $1,000 (approx. €937.14).

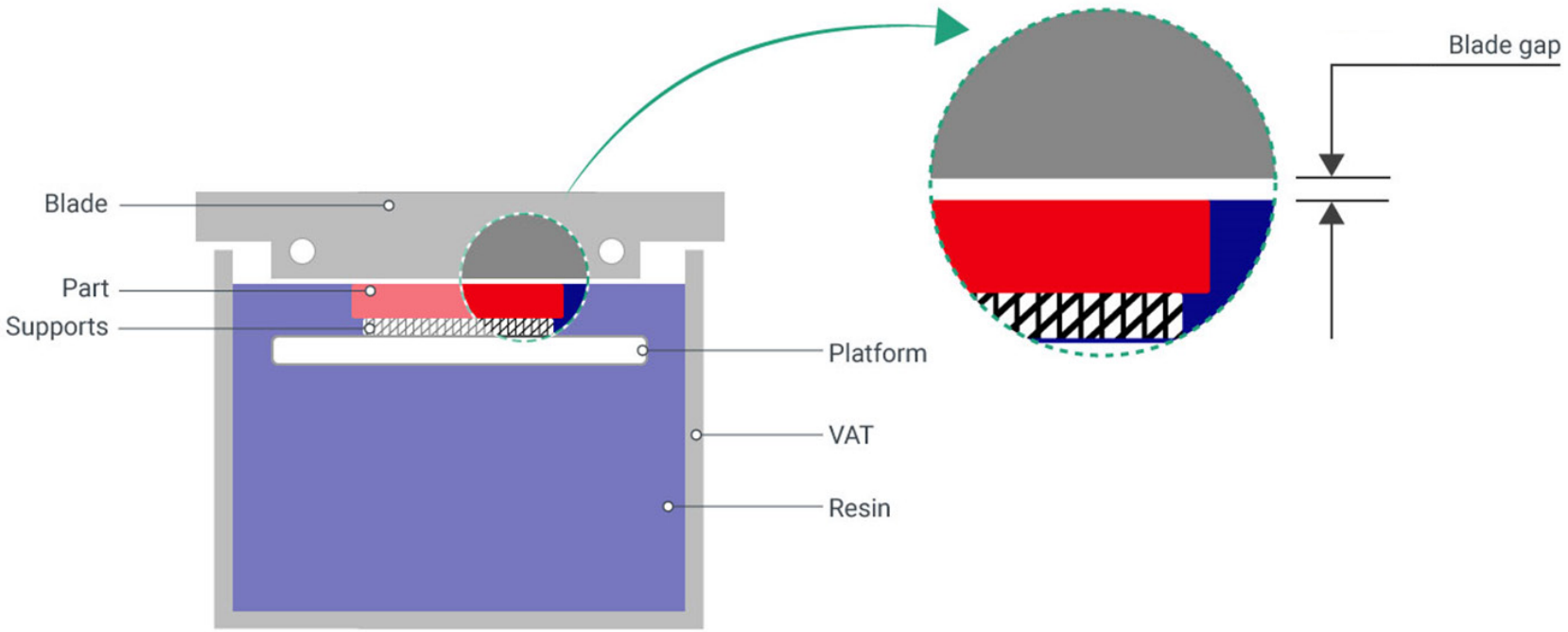
To help reduce the need for blade gap adjustments the Neo was designed with a dual rail recoater system, and stall detection.

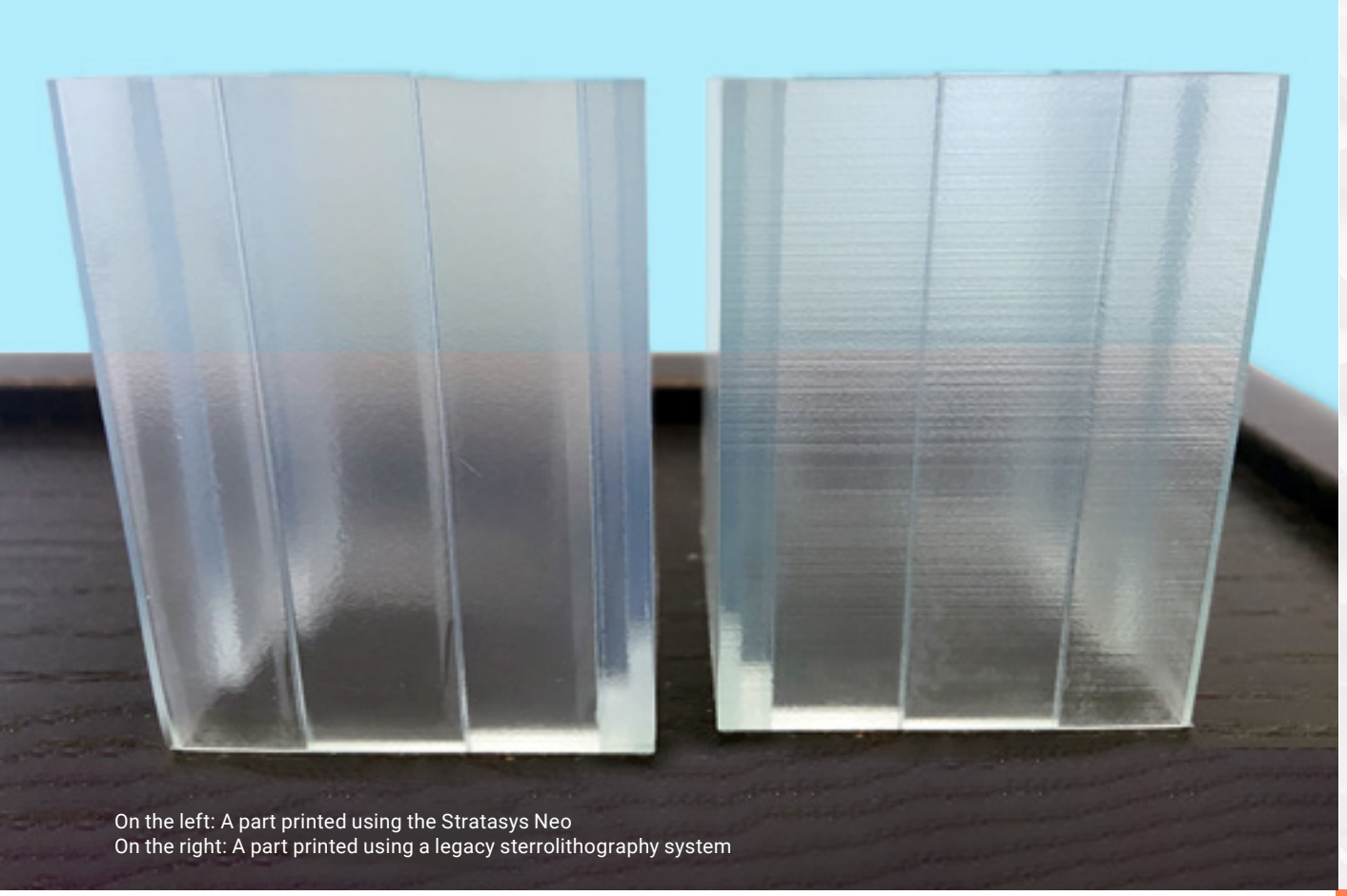
The simple design of the Neo’s recoater blade also allows users to easily remove and clean, without the need for a costly service engineer visit.

The Neo’s simpler design of the recoater blade resulted in:

- ✓ Close-to-zero downtime and failed builds (saving thousands of dollars in wasted materials)
- ✓ Reduced service call-outs







On the left: A part printed using the Stratasys Neo
On the right: A part printed using a legacy sterrolithography system

Part Quality

Poor surface finish was another area the Neo engineers wanted to improve. In legacy systems, parts with fine details or thin walls could not be produced, and many standard parts had course side-wall quality. This resulted in many man hours of post processing, sanding down parts to achieve a smooth surface.

The Neo's precision and superior layer to layer repeatability resulted in improved part fidelity and produced parts with a smooth surface finish, minimizing manual labor and cutting post-processing time by up to 50%.

The superior beam quality stability enables continuous fine detail production.

Post Processing: Large-volume printing requires 2 hours of hand finishing per print. 5 days per week, 50 weeks per year. 1 hr saving per day. 250 labor hrs.

Texturing on the part is more visible due to outstanding part quality.

Open Resin Design and Materials

Many stereolithography 3D printers are designed with a locked resin system. The locked system requires materials to have a scannable RFID tag that can result in hardware and tag reading issues. Locked systems also limit the material choices available, with a knock-on effect on application.

The Neo was designed with an open resin system, which offers users the ability to choose commercially available 355 nm resins. There are also no RFID reading issues or potential problems with pumps when refilling materials, a common concern with locked resin systems.

Open resins systems are far more flexible, efficient and cost-effective for the user:

- ✓ Reduced point of failure and downtime
- ✓ Users have the freedom to choose the optimum material for their application
- ✓ Access to a large range of material options

Click here to learn more about the range of Somos stereolithography materials for the Neo 3D printer.

Software

Many SLA 3D printers feature specific software that enables users to set builds, adjust parameters, monitor builds and create reports, but they have limited options to optimize build settings, they lack traceability, and are often not user friendly.

The Neo's experience-driven design and customer-focused Titanium™ software was developed with the user in mind - and by engineers who understand the importance of simple day-to-day operation and comprehensive reporting capability. With simple click-and-print operation, it also has more detailed functionality for part traceability, build history, materials usage, as well as vast reporting options such as hardware utilization and resin viscosity testing.

The Neo's Titanium software enables:

- Full part traceability data
- Longer materials lifetime
- Customized notifications and reporting
- Faster print speed, higher yield
- Remote diagnostics to fix problems, fast.

Printer Platform

Many existing stereolithography 3D printers have a smaller print platform, yet have a larger footprint, taking up more floor space.

The Neo 3D printers were designed for efficiency, with a smaller, more compact design, but with a larger print platform.

Neo800

- Larger platform size and build volume (35% extra) than existing stereolithography 3D printers
- Allows larger part size and additional print capacities

Neo450

- Smaller floor space required (just 41.3 x 48.2 inches or 1050 x 1225 mm)
- Reduce the number of machines you need in your workshop with HD and SD build modes in a single printer.

Platform Size

- 800 x 800 x 600 mm
- 31.50 x 31.50 x 23.62 in

Platform Size

- 450 x 450 x 400 mm
- 17.72 x 17.72 x 15.75 in

Summary

A stereolithography 3D printer designed for peace of mind

The Neo is a large and midsize format stereolithography printer, built for reliability and durability, producing high volume and large parts with superior surface quality, accuracy, and detail.

The Neo has been developed with the operator and team leader in mind, featuring:

- Next-gen machine design for highly accurate parts with unparalleled industry quality.
- Exceptional part sidewalls and crisp feature resolution reduce finishing time by up to 50%
- Compact footprint and larger print platform, with different build options and modes to suit all applications.
- High-power laser and dynamic beam size control for greater accuracy. Variable beam size also featured for greater build speeds and maximum productivity
- Open materials system processes any commercially available 355 nm SL resin for greater flexibility and efficiency.
- Enhanced workflow, traceability and data reporting with intuitive Titanium software.

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