

CASE STUDY

From Bottlenecks to Breakthroughs: Stratasys Direct® Optimizes Resin Removal with PostProcess Technologies™

OVERVIEW

Stratasys Direct®, the service bureau division of Stratasys, is known for providing on-demand 3D printed parts, post-printing and finishing services across various industries, including Aerospace & Defense, Medical, Automotive, Energy, Commercial and Consumer Products.

Their Tucson, Arizona facility specializes in Stereolithography (SLA) and Programmable Photopolymerization (P3™ DLP) 3D printing technologies. Their comprehensive solutions include design and engineering support, material selection, and production, tailored to meet the specific needs and budgets of customers across industries.

Despite their advanced 3D printing capabilities and level of output, the post-printing of these parts, particularly for removing excess resin, posed significant challenges.

This case study explores how the implementation of PostProcess Technologies™ DEMI 4100™, DEMI 830™ and PLM-403-SUB™ solutions transformed operations to reduce cycle times, increase operational efficiency and maintain high-quality standards in part quality.

PRODUCTION BOTTLENECKS AND SAFETY RISKS: A CASE FOR CHANGE

Stratasys Direct's Tucson facility currently operates 20 industrial SLA machines, four industrial P3 machines, and they print 13 different materials. With this level of output, efficiency is key.

However, Stratasys Direct faced ongoing bottlenecks with their resin part cleaning processes. Their procedure included traditional resin removal techniques, including the use of isopropyl alcohol (IPA) baths and various hand tools. This was both labor-intensive and time-consuming for operators in their facility. Not only that, but this method was particularly challenging for complex 3D printed parts, often resulting in inconsistent cleaning, potential part damage, and a hazardous work environment with the use of IPA.

They faced several ongoing issues with these traditional cleaning methods, including:

Operational Inefficiencies: IPA baths led to operational inefficiencies, requiring operators to constantly monitor and replace them. This

became a labor-intensive process that was especially challenging for complex 3D printed parts, compromising the quality and consistency of the final product. This not only increased labor costs, but also reduced overall throughput.

Production Cycle Delays: The manual resin removal process added a significant bottleneck to production, as each build platform needed individual attention, dragging out production cycles. Operators resorted to soaking the platforms in acetone, further slowing down the process and delaying the machines' readiness for the next job.



Manual Resin Removal Process

Elevated Safety Considerations: The increased volume of IPA required for consistent resin removal created operational and environmental concerns.

Inconsistent Part Cleaning: The instability of IPA for resin removal made it difficult to consistently produce mass quantities of high-quality parts. IPA quickly became saturated with resin, leading to inconsistent cleaning and tacky surfaces. To mitigate this, frequent IPA refreshes were needed. These inconsistencies led to part breakage, increased part rejection rates and delayed workflows.

To address these challenges, Stratasys Direct teamed up with PostProcess Technologies to reduce manual labor and streamline operational efficiency.

FROM CHALLENGE TO SOLUTION: STRATASYS DIRECT'S AUTOMATED RESIN REMOVAL TRANSFORMATION



PostProcess DEMI 800™ and DEMI 4100™
Solutions for Resin Removal

Recognizing the need for a more efficient post-printing process, Stratasys Direct saw an opportunity to leverage their ongoing partnership with PostProcess Technologies. This collaboration allowed them to integrate PostProcess' automated resin removal solutions directly into their workflow.

Stratasys Direct implemented PostProcess' DEMI 4100 and DEMI 830 solutions, along with the PLM-403-SUB detergent, to fully automate their resin removal process. These full-stack solutions combine advanced hardware, software-controlled technology, and proprietary chemistry to ensure consistent resin removal while protecting overall part integrity. The integration of these systems was designed to overcome Stratasys Direct's existing challenges, ultimately boosting efficiency, throughput, and part quality at their Tucson facility.

TRANSFORMING WORKFLOW EFFICIENCIES WITH POSTPROCESS TECHNOLOGIES

The integration of PostProcess' DEMI 4100 and DEMI 830 solutions has significantly enhanced Stratasys Direct's resin removal process. They experienced several key benefits with these automated solutions, including:

Reduced Cycle Times: Cycle times in the DEMI 4100 and DEMI 830 take ten minutes on average. The ability to load and clean multiple parts simultaneously in these PostProcess solutions has dramatically cut cycle times for Stratasys Direct. In addition to cleaning the parts, the excess resin is also removed from the build platforms in one step, eliminating their need for an additional manual step involving IPA and acetone.

Labor Efficiency: PostProcess' AUTOMAT3D® software offers a one-touch operation system, enabling operators to store multiple workflow "recipes" and significantly reduce the need for manual intervention. This software drastically improved labor efficiency, giving operators the ability to multitask during the cleaning cycle. This increased throughput and scalability without the need for additional staff for labor-intensive post-printing tasks.

Consistent Quality Control: With programmable controls for time, heat, and agitation, these solutions ensure that each part is cleaned consistently and to the highest standard every time.

Enhanced Safety: PLM-403-SUB, a non-flammable detergent, addressed the safety concerns associated with the use of IPA. With a significantly lower vapor pressure compared to IPA, PLM-403-SUB reduced the risk of fire and explosions, enhancing workplace safety and minimizing operational disruptions.

Cost Savings: The integration of PLM-403-SUB has significantly reduced IPA consumption and associated costs. This distillable detergent can be recycled and replenished efficiently, outperforming IPA by cleaning ten times more parts before reaching saturation. There is also ten times less waste created with PLM-403-SUB. This reduction in hazardous wastes has led to significant cost savings for Stratasys Direct.



"We've been able to reduce total post-processing time by about **60%**. For example, a job that took us 120 minutes to post process now **only takes 45 minutes.**"

- Sean Schoonmaker, Director, Operations at Stratasys Direct

The implementation of PostProcess' DEMI 4100 and DEMI 830 solutions, has transformed Stratasys Direct's resin removal process. These advanced automations have not only streamlined production cycles and reduced labor demands but also enhanced safety and consistency in part quality.

By significantly lowering cycle times, improving labor efficiency, and cutting costs through reduced IPA usage and waste, Stratasys Direct has strengthened its ability to deliver high-quality products to its customers. These improvements underscore the facility's commitment to operational excellence and its capacity to meet growing industry demands with precision and reliability.