

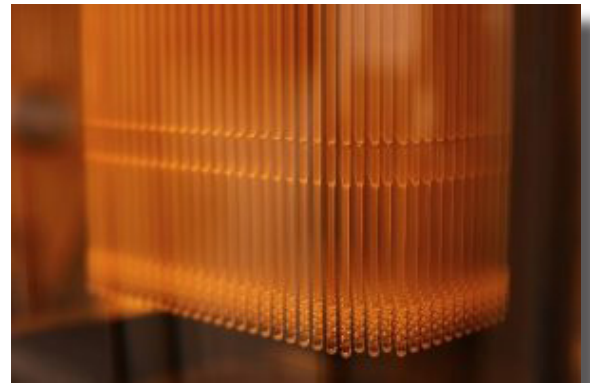
CUSTOMER SPOTLIGHT

PrintParts

RISING TO THE CHALLENGE: SECURING AN EMERGENCY SUPPLY PRODUCTION CONTRACT

Founded by Robert Haleluk in 2016 as an additive manufacturing service bureau in Manhattan, New York, Print Parts Inc. stepped into action as the COVID-19 public health crisis swept New York City in early 2020. As New York City was hit especially hard in the early stages of the pandemic, Print Parts began to explore what they could do to support the city. In response to a mandate put forward by the Mayor de Blasio's office to build a complete COVID response supply chain within the five boroughs, Print Parts soon identified that swabs were going to be one of the most critically-needed components for testing kits.

After identifying the shortage, Print Parts began working closely with the New York City government to determine if 3D printing nasal swabs, to meet the high demand, was an achievable undertaking. Though it was clear it wouldn't be easy, Print Parts took on the challenge. A lot of "boots on the ground" work was initially required to get swab samples ([per a swab design by EnvisionTEC and validated by Harvard BIDMC](#)) approved by every testing facility they planned to supply, but Print Parts quickly brought the early stages of a supply chain into fruition. Their work ethic spoke for itself, and soon they were chosen by New York City as the prime contractor to ultimately supply over one million 3D printed nasopharyngeal (NP) swabs. During this time, the company rapidly scaled and expanded its operations with additional 3D printer capacity and employees, as well as FDA consultants to ensure ISO-13485 compliance.



3D Printed Nasopharyngeal (NP) Swabs

FACING THE CHALLENGES: SCALING 3D PRINTING FOR HIGH-VOLUME PRODUCTION

While they had long utilized smaller desktop Stereolithography (SLA) printers for prototyping and small-batch production of end-use parts, Print Parts realized that to enable rapid full-scale production, they had to scale their throughput abilities. Thanks to a grant from New York State, the lab was able to expand with a fleet of dedicated industrial EnvisionTEC EnvisionONE systems with cDLM technology. [EnvisionTEC](#) was selected as a partner because they were one of the leading OEMs (original equipment manufacturers) who had developed an FDA-approved 3D printed swab.

Once Print Parts developed a 3D printing process for producing the swabs, the challenge lay in post-processing at high volume. How do you establish a workflow that can post-print eight machines' worth of parts every four hours? In addition to facing supply chain shortages in the midst of the pandemic (e.g. basics like paper towels), Print Parts struggled with the bottleneck of performing resin removal on the delicate swabs at a pace that would meet the high level of demand. To bring efficiency to their process and free up manual labor, Print Parts put together a workflow that was as close to automation as possible without bringing in full-on robotics.

A FUTURE-PROOF INVESTMENT: AUTOMATED RESIN REMOVAL

That's where PostProcess Technologies' automated post-printing and resin removal detergent solutions came in. As post-printing and curing were decidedly the two largest elements of human labor in this workflow, Print Parts realized that implementing a [PostProcess™ DEMI 800™](#) allowed them to produce exponentially more swabs by accelerating the resin removal process. In order to deliver the hundreds of thousands of swabs per week that New York City was requesting, Print Parts had to be able to process multiple batches of swabs at a time. Additionally, during a period when isopropyl alcohol (IPA) supply was at an all-time low, PostProcess's proprietary detergent proved especially advantageous. Designed specifically for post-printing, the detergent's optimized longevity and flashpoint improved workplace safety and efficiency.

“The *only solution* that could get us where we needed to with demand was PostProcess.”

Regarding incorporating the DEMI 800 into their workflow, Founder of Print Parts Robert Haleluk said, “We wanted to invest in a system that was going to be the right system for not just swabs, but for our parts business going forward. So we wanted something that had programmable settings, a tank that could take a bigger build, more parts, and the right kind of throughput that allows us to wash as many parts as we could print. We were focused on producing swabs, but we had an existing SLA business, and wanted a solution for both. Thinking about how the chemistry works, how the detergents break down resin faster than others or even IPA...the only solution that could get us where we needed to with demand was PostProcess.”

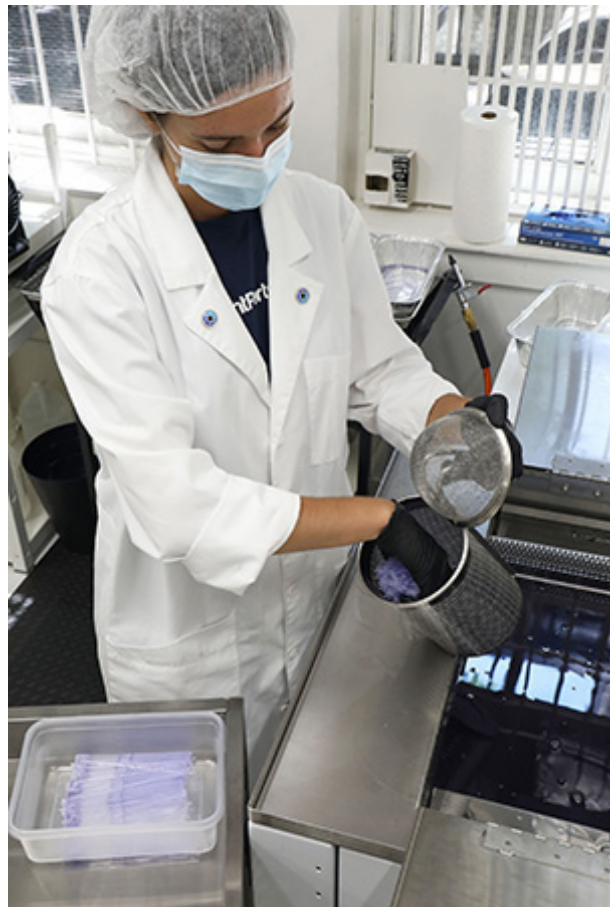


PostProcess™ DEMI 800™ Resin Removal Solution

Speaking to throughput that the PostProcess solution has helped to enable, co-founder and Head of Partnerships Cody Burke said, “The swabs are very small, so it’s easy to knock the resin off. It only took about 90 seconds with the ultrasonics - the combination of detergent and the ultrasonics - and that would’ve been about 12 minutes in IPA, so for speed comparison, it was a huge benefit. On a typical day when we were in peak production, about 8,000 swabs would pass through the DEMI 800 in a day, and that’s about half an hour of DEMI 800 time, versus the four hours it would have taken to do the equivalent amount in IPA.”

Even during the big production pivot around COVID, Print Parts was able to maintain their normal production speeds in making other parts. They have also been successful in running other resins through the DEMI 800. When it comes to the continued value of the DEMI 800, Haleluk says, “When you’re investing in machines, you try to future proof yourself; you want to make sure you’re investing in a machine you’re going to use every day or every week to free up a workflow. I love that we have a great opportunity in expanding our business and putting more through the machine.” Regarding the ease of the system’s AUTOMAT3D® software platform, he continued, “It’s automated so you can kind of set it and forget it, it’s got a programmable nature. You come back

in whatever your timeframe is - a minute, two minutes, eight minutes - and your parts are clean. It’s pretty exciting to know that it’s one less thing we have to worry about when it comes to post-printing parts.”



**Processing 3D Printed Swabs in the
PostProcess™ DEMI 800™**



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