

CASE STUDY

Protecting Delicate 3D Printed Wax Jewelry Parts: How Stuller Automated Wax Support Removal with PostProcess

OVERVIEW

CHALLENGE:

After 3D printing, Stuller relied on a manual IPA-based wax support removal process that created challenges with cleaning consistency, delicate part handling, breakage, and operator safety.

SOLUTION:

By implementing the PostProcess® DEMI X 520™ for Wax Removal, Stuller automated wax support removal with a validated workflow that protects delicate parts and delivers consistent, hands-free processing.

RESULTS:

Less than one year after installation, the PostProcess DEMI X 520 solution became part of Stuller's daily production, delivering more consistent cleaning, fewer broken parts, reduced manual labor, and an overall safer wax workflow for delicate wax casting patterns.

THE CHALLENGE: PROTECTING DELICATE WAX PATTERNS DURING MANUAL IPA CLEANING

For more than 50 years, Stuller has been at the heart of the jewelry industry, supplying fine jewelry, mountings, tools, packaging, diamonds, and gemstones for today's retail jewelers.

Today, the company offers more than 200,000 products through operations in North America, Spain, and Thailand, providing quality products, rapid fulfillment, and services.

To support its manufacturing operations, Stuller utilizes a variety of additive manufacturing technologies. For their wax printing workflow, Stuller currently uses **Flashforge MJP printers**, producing approximately 250 wax casting patterns each week. The company previously relied on a manual cleaning process using isopropyl alcohol (IPA). After printing, wax patterns were soaked in IPA for 10 to 15 minutes to remove residual material before moving into the casting process.

However, this manual approach created **challenges with consistency, part handling, and operator safety.**

Because IPA is highly volatile, variations in solvent concentration, temperature fluctuations, evaporation, and soak times made it difficult to achieve consistent cleaning results.

The fragile nature of wax casting patterns also increased manual labor. Handling delicate parts throughout the cleaning process increased the risk of breakage, resulting in additional labor or reprints. These interruptions added time to the production process and created inconsistencies in a critical step of the workflow.

In addition to process challenges, the use of IPA created environmental, health, and safety concerns related to solvent handling, flammability, and disposal requirements.

Stuller needed a more reliable post-processing solution to protect fragile wax patterns and deliver consistent, repeatable results from print to casting.

THE SOLUTION: A REPEATABLE WAX SUPPORT REMOVAL PROCESS WITH THE POSTPROCESS DEMI X 520

In June 2025, Stuller installed the **PostProcess® DEMI X 520™ for Wax Removal** paired with **PLM-601-SUB detergent** to automate the cleaning of their wax prints.

The DEMI X 520 for Wax Removal combines intelligent software, purpose-built hardware, and specially formulated PLM-601-SUB detergent to automate the cleaning of fragile wax parts. Designed specifically for wax applications, the system features recipe storage for simplified, hands-free processing and delivers **consistent, repeatable cleaning** while preserving the fine feature details required in jewelry casting.



PostProcess DEMI X 520 for
Wax Removal Solution

After installation was complete, the Stuller team worked closely with PostProcess over several months to optimize recipes and develop a production-ready workflow tailored to their application process. With minimal ongoing support, the team successfully validated a repeatable process that could be implemented directly into daily manufacturing.

Stuller also developed a unique production workflow to further protect fragile parts. After wax patterns are printed on their Flashforge MJP printer, they remain attached to their supports and are attached directly onto a **casting sprue**. The complete sprue is then placed into the DEMI X 520, where supports are

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“We needed an automated post-processing solution that would protect delicate part features while replacing IPA with a safer, longer-lasting cleaning solution. The PostProcess DEMI X 520 delivered on every requirement.”

— **Ben Hebert**

R&D Assoc Process Engineer,
Stuller



Stuller Casting Sprue

removed while the patterns remain secured throughout the cleaning process. Up to six sprues can be processed in a single cycle before moving directly into investment casting.

By implementing and validating their workflow with the DEMI X 520 for Wax Removal, Stuller was able to move beyond manual IPA cleaning with a safer, more consistent post-processing solution.

THE RESULTS: CONSISTENCY, RELIABILITY & SAFETY BUILT INTO EVERY CYCLE

Less than one year after installation, the PostProcess DEMI X 520 for Wax Removal transitioned into **full daily production** at Stuller's facility.

By automating wax support removal, Stuller established a **repeatable, hands-free workflow** that delivers **consistent cleaning results from cycle to cycle**. The standardized process significantly reduced the inconsistencies associated with manual IPA cleaning, allowing operators to produce more predictable and reliable outcomes.



Keeping parts secured on the sprue throughout the cleaning process also reduced handling of delicate wax patterns, **resulting in fewer broken parts** and less time spent reworking or reprinting damaged components.

In addition to improving part quality, replacing IPA with PostProcess detergent helped create a **cleaner and safer production environment** by reducing operator exposure to flammable solvents and minimizing the ongoing challenges associated with evaporation and disposal.



Stuller Wax Ring Castings

Today, the DEMI X 520 has become an **integral part** of Stuller's production workflow, enabling the company to consistently prepare wax casting patterns for investment casting with greater reliability, less manual labor, and improved process repeatability.

About Stuller

Stuller is a leading jewelry manufacturer and supplier, providing fine jewelry, mountings, tools, packaging, diamonds, gemstones, and services to retail jewelers worldwide. Founded in 1970 and headquartered in Lafayette, Louisiana, Stuller supports the jewelry industry through a combination of advanced manufacturing, digital technologies, and a catalog of more than 200,000 products. With operations across North America, Spain, and Thailand, the company delivers high-quality products and rapid fulfillment to jewelry professionals around the globe. Stuller continues to advance jewelry manufacturing through innovative production methods, including additive manufacturing technologies that enable efficient, precise, and scalable workflows. Learn more at stuller.com.

About PostProcess Technologies

PostProcess is the leader in automated and intelligent post-printing solutions for 3D printed and additive manufactured parts. Founded in 2014 and headquartered in Buffalo, NY, USA, with international operations in Mougins, France, PostProcess removes the bottleneck in the final stage of the 3D printing workflow, post-processing, through a combination of software, hardware, and chemistry technologies. The company's solutions automate industrial 3D printing's most common post-printing processes including support removal, resin cleaning, and surface finishing, enabling customer-ready 3D printed parts at scale. The PostProcess portfolio has been proven across all major industrial 3D printing technologies and is in use daily in every imaginable manufacturing sector. Learn more at postprocess.com.