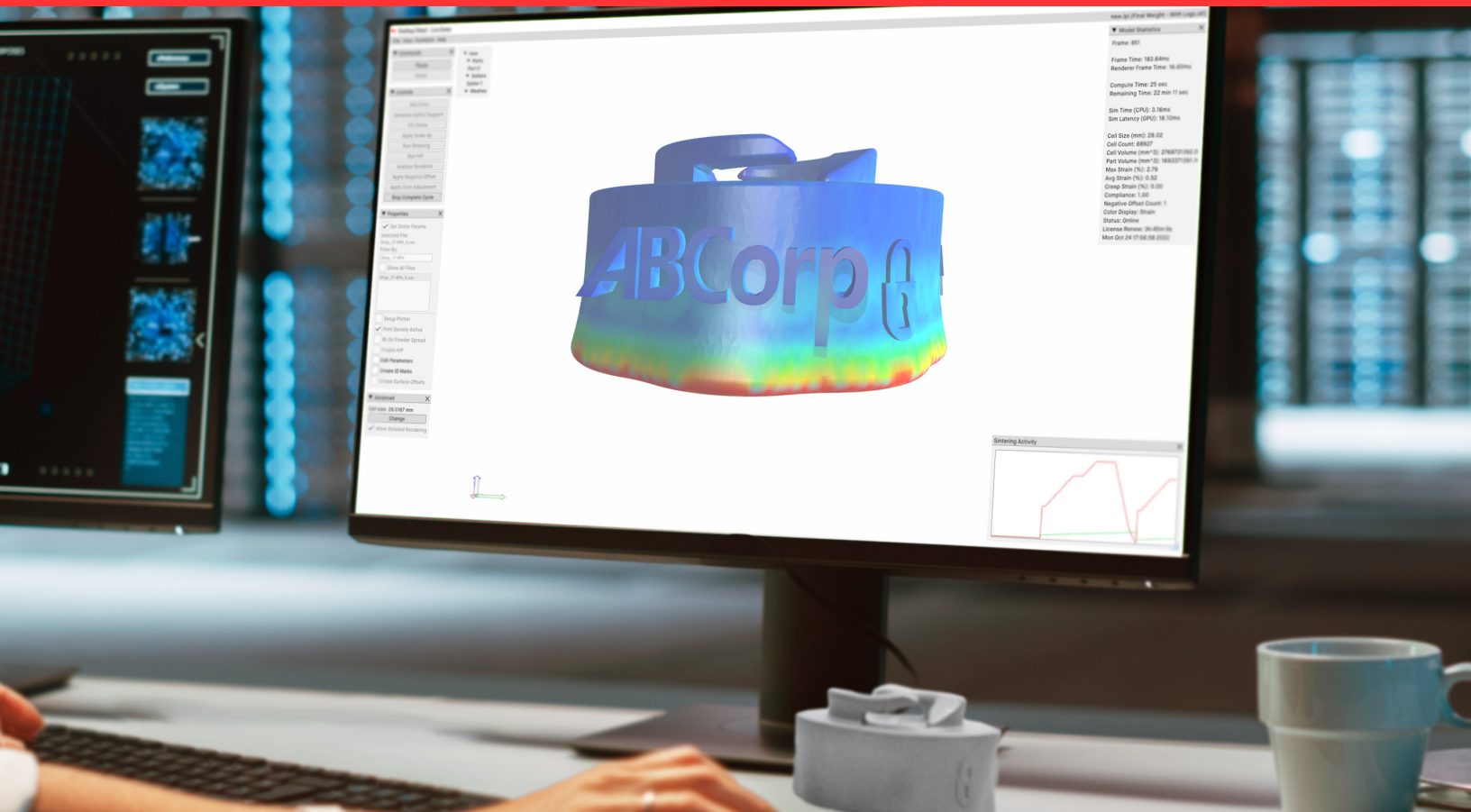


Sintering Distortion and Compensation Software for Metal 3D Printing Success

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ABC Corp uses Live Sinter™ for successful binder jet 3D printing on the Shop System™





Customer
ABC Corp

Location
Boston, MA

Industry
Additive manufacturing services
supporting a variety of industries

Application
Prosthetic weight

Machines
Desktop Metal Shop System™

Material
316L and 17-4 PH

Website
www.abc Corp.com

A Rich History Leads the Way for Ongoing Innovation

ABC Corp is one of the longest standing manufacturing service providers in the United States with a history dating back over two centuries. As a printing house that developed some of the first counterfeit-resistant currency for the First Bank of the United States, everything ABC Corp produces today, from contactless credit cards and gift cards to custom packaging and metal 3D printed prototypes, is wrapped in an envelope of protection. “We sell security,” said Neil Glazebrook, Vice President of 3D Solutions at ABC Corp in Boston.

The company’s 225,000 square foot facility in Boston features vertically integrated production for a variety of products, including 12-18 million payment cards each month. At the onset of the COVID-19 pandemic, the privately owned company saw an opportunity to provide a vital service by implementing a rapid manufacturing line of PPE equipment. “We have three core pillars at ABC Corp,” Glazebrook explained, “Community, civic duty, and inclusion.” 3D printing allowed the company to use its manufacturing experience to help the community in need, and it also showed the company new opportunities of what’s possible.

“The fast turnaround times of 3D printing already made sense to the operations of ABC Corp,” Glazebrook said. “Contract manufacturing of credit cards is really manufacturing on-demand; we make a new one as it’s needed. So we already understood the structure of that kind of production.”

Today the expanded 3D house is its own separate business unit offering product development and contract manufacturing services.

Hardware and Software Solutions for Turnkey Binder Jetting Success

After gaining experience with polymer 3D printing, ABCorp turned to Desktop Metal for its first metal 3D printing system. “We were looking to make end-use parts and needed an option to operate in a functional production environment,” Glazebrook said. ABCorp invested in the binder jetting technology of a Desktop Metal Shop System in 2021 for the production of 17-4PH Stainless Steel.

In addition to the easy-to-use Shop System, a key component to the out-of-the-box success of ABCorp’s binder jetting operations is Live Sinter, Desktop Metal’s manufacturing preparation software that provides advanced simulation tools to predict and correct for errors when sintering 3D printed parts. “One of my biggest worries investing in this technology was the furnace and the frustration of failing that far into the process during sintering. Using Live Sinter, I’m blown away at our success with the sintering furnace,” Glazebrook emphasized.

Rather than printing a part straight to have it warp out of spec, Live Sinter prints a negative offset that will sinter to meet dimensional tolerances, enabling unique distortion compensation that helps ABCorp increase success rates and reduce costs. “I don’t have to use sintering supports anymore, so I don’t have to charge for supports. I use Live Sinter for everything and it makes it more competitive,” Glazebrook said.

The ability to offer fast product development without tooling investments has expanded the business relationships of ABCorp. Glazebrook speaks of one existing customer that utilized 3D printing to produce a fixture to hold paper for a traditional printing job, but states that around 80% of the company’s 3D printing customer base consists of new relationships. “Metal 3D printing brings in a lot of growth opportunities, especially for applications like prosthetics, robotics, fluid dynamics, and replacement parts,” Glazebrook said.

The Desktop Metal Shop System is part of the additive manufacturing portfolio at ABCorp



Application Example

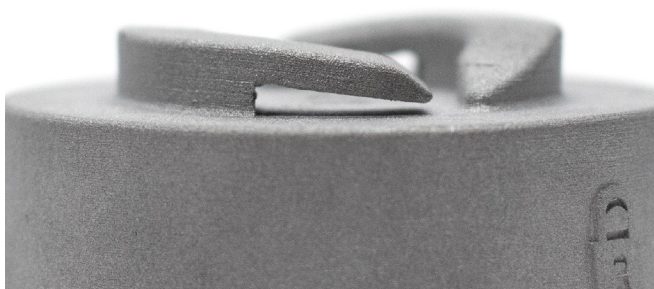
Prosthetic Weight

In early 2022 ABCorp announced the FDA registration of its Boston-based Center of Excellence to support medical manufacturers with metal binder jetting services on a wider scale to reduce a product's time-to-market. While this component may not seem like an optimal candidate for 3D printing because of its density, this weight is manufactured with precision to lock into the prosthetic socket. It is required to be a specific weight to accurately mimic the feel and function of a natural forearm while seamlessly integrating with the patient-specific socket.

With traditional binder jetting production the overhangs of the connectors would require support during sintering. Using Live Sinter to simulate the warpage and distortion during sintering ABCorp is able to 3D print a negative offset geometry that sinters straight. "There are no supports. That's Live Sinter." Glazebrook emphasized.

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Neil Glazebrook, Vice President of 3D Solutions at ABCorp



The overhang of the connector on the left sags in the furnace without sintering supports. The overhang on the right, run through Live Sinter to simulate the warpage and distortion during sintering, was 3D printed with a negative offset geometry that sinters to the final specification.



About ABCorp

ABC Corp's history dates back more than 225 years to 1795. The company started out as secure printers – designing & producing better, more counterfeit-resistant currency for the First Bank of the United States. Its products & services have changed, but security envelopes everything the company does. Today, ABC Corp offers a wide variety of products and services including the design, manufacture, and personalization of contactless credit & debit cards, instant issuance programs for physical and virtual ID and payment cards, as well as 3D printing highly detailed prototypes & parts. Countless government agencies and world-class companies rely on ABC Corp to better engage with their constituents and customers in a secure manner, evolving to higher levels of security, trust, and utility.



About Desktop Metal Inc.

Desktop Metal, Inc. is accelerating the transformation of manufacturing with end-to-end metal 3D printing solutions. Founded in 2015 by leaders in advanced manufacturing, metallurgy, and robotics, the company is addressing the unmet challenges of speed, cost, and quality to make metal 3D printing an essential tool for engineers and manufacturers around the world. In 2017, the company was selected as one of the world's 30 most promising Technology Pioneers by the World Economic Forum, and was recently named to MIT Technology Review's list of 50 Smartest Companies. For more information, visit www.desktopmetal.com.