



INTERVIEW

# Building a new world with AM at Burloak Technologies

Exclusive interview with Keyvan Hosseinkhani and Jason Ball

With over 165 years under its belt and over \$4.5 billion in revenue, Samuel, Son & Co. is one of the most well-established metal processing companies in Canada. The family-owned business serves clients from virtually every industry that uses metal, from automotive and aerospace, to the rail industry, to oil and gas and other energy sectors. In recent years, the company has become increasingly interested in additive manufacturing both to meet the changing demands of its clients and to stay ahead of metal manufacturing trends.

As part of this evolution, Samuel acquired a stake in Burloak Technologies, a specialist in metal AM production based in Oakville, Ontario. This was back in 2017. As the interest in metal AM grew and Burloak's business expanded, Samuel made the decision to acquire 100% of Burloak Technologies in early 2020, establishing the company as its AM-focused division.

Since the acquisition, Burloak Technologies has only continued to grow, helping customers from various industries to explore and exploit the benefits of metal additive manufacturing, forging new partnerships and expanding its international footprint. We had the opportunity to catch up with Technical Director at Burloak Technologies Keyvan Hosseinkhani and VP of Business Development Jason Ball, who shared how Burloak Technologies has positioned itself to support its customers around the world with metal AM applications and production capabilities.

## Diverse technologies for diverse applications

One of the first things to know about Burloak Technologies is that it has a broad focus within the purview of metal additive manufacturing. The company operates many different metal AM processes and machines. Hosseinkhani explains: "We have a wide variety of machines with different capabilities. For example, we have fleets of powder bed fusion machines from EOS, TRUMPF, Renishaw and SLM. We also have binder jetting for

metals as well as directed energy deposition (DED) machines for metals."

This variety enables Burloak to not only handle a wide variety of metal applications but to offer its clients the best solution for their needs, ensuring that the AM technology chosen for the job is the best fit in terms of efficiency, cost and quality. For instance, while aerospace applications are well suited to metal LPBF, there may be more opportunities in binder jetting for automotive and energy applications.

Many of these metal AM systems are found under one roof at Burloak's Additive Manufacturing Centre of Excellence (AMCE) in Oakville. The facility, which opened in 2018, houses metal 3D printer fleets, as well as all other equipment and technologies required for an end-to-end process. This includes heat treatments, HIP furnaces, post-processing and more.

"In house, we have the complete capability," says Ball. "That keeps our efficiency up. One of the challenges of metal AM if you're just doing printing is the logistics of having to go between different vendors, so we have that entirely contained within our facility."

Burloak Technologies' AMCE facility houses end-to-end processes for metal AM.

Image: Burloak Technologies



The metal AM workflows established by Burloak are suitable for many applications and production scales, whether its application development, rapid prototyping or high-volume production. “We have set up our shop to have an area where we do a lot of R&D, and then we also have an area where we handle higher volume production runs,” Ball explains.

Notably, Burloak recently expanded its production capability with the acquisition of a new facility in Camarillo, California. Spanning 25,000 square feet, the new site (including assets and equipment) was acquired from Carpenter Technology Corporation and has established Burloak Technologies as North America’s first multi-site AM services provider.

## A customer-focused journey

As a services provider, Burloak Technologies is well positioned to introduce customers to metal additive manufacturing and demonstrate the technology’s advantages for certain applications. This means that not only does the Burloak team specialize in metal AM as a process, it also eases the entry into metal AM by providing knowledge and expert recommendations.

Burloak Technologies is based out of Oakville, Ontario in Canada.

Image: Burloak Technologies



“The additive journey is not a short one,” Ball says. “Customers come to us with different levels of understanding, so the first part of our job is really educating them on additive, showing them what the capability is and trying to show what parts make sense. We then partner with customers to go through a business case and eventually make a part. That’s the truest way to prove a business case.”

Hosseinkhani emphasizes that the company does not design parts for customers, rather it works with them on existing designs by providing recommendations tailored to the AM process. “The customers always own the design,” he says. “We provide recommendations based on our experience with different materials, processes and geometries. We will suggest modifications to the design to optimize it for a particular metal AM process.”

These recommendations aim to make the most out of the AM process, leveraging things like lightweighting, part consolidation and material consumption, as well as other steps in the AM workflow, such as post-processing. “You always have to look at the whole chain,” Hosseinkhani adds. “I may be able to make the most beautiful part, but to make it economical I don’t want to spend too much time on post-processing. So, we also design for minimum post-processing.”

On the whole, Burloak reports that there is a noticeable increase in interest for pursuing metal AM applications from customers. “We’re seeing increased activity not only with existing customers, but also from industries that have not yet touched additive manufacturing,” says Ball. “More and more companies believe AM is a disruptive technology and are making moves to be included in the journey.”

Of course, while interest in metal AM grows in new areas, one of Burloak Technologies’ key customer industries is one that has been driving metal AM from the very beginning: aerospace. An established supplier



Burloak Technologies was fully acquired by metal processing company Samuel, Son & Co. in 2020.  
Image: Burloak Technologies

of metal AM parts for aerospace applications, Burloak took its position to the next level recently when it received Boeing BAC 5673 approval for the production of aluminum parts.

The approval was granted in January 2021 after a 16-month collaboration with Boeing and has made Burloak Technologies the first company in the world to achieve the aerospace qualification for printing AlSi10Mg aerospace parts. "It's qualified us to manufacture aluminum parts on a specific machine platform, so we're now able to print any geometry in aluminum for Boeing," Ball elaborates. "It is a big win for us and shows our strength in aviation and our commitment to our relationship with Boeing."

## Continued growth for Burloak and additive manufacturing

Looking forward, Burloak Technologies is working on bringing its new U.S.-based facility online, which will enable it to work with more American companies and expand its production and services. "We're going to follow our current game plan," says Ball. "We now have the capability to do manufacturing in the U.S. and Canada, and we're going to continue to grow in these markets by helping our customers."

Looking at the metal AM more generally, Burloak Technologies sees both the challenges and potential that await the industry. Ball points to education as a hurdle that needs overcoming, especially when it comes to

design. "When you are brought up with the design rules that have applied to conventional machining and techniques, you have to learn how to design differently for AM," he says. "So we have to educate younger folks to teach them how to design for additive."

Of course, another hurdle to widespread adoption is the need for technological advancements. "To close more business cases, the machines have to be able to print faster and the cost of materials needs to come down," he adds. "But all that will come over time as it is continually being developed. That's why we keep such a large fleet of different technologies, so we can stay at the forefront and see how the technologies are advancing."

"It will take some time but imagine if all the parts were designed to be printed: your supply chain would look extremely different than it does today. No more stocking parts, no more need for inventories. You're keeping a set of data and you're pulling from that data when you need it. But we must transition to that," he concludes.

"For a customer that has a traditional design and production fleet, transitioning completely to additive will take a long time. But we have to start the journey somewhere. So, you start with components. You start with part consolidation. You help customers with the journey to understand it. And once that migration to additive happens, it's going to be a different world." ♦

Burloak Technologies works with customers from across many industries, playing a vital role in the implementation and adoption of metal AM.

Image: Burloak Technologies

