

eBOOK

7 WAYS BIGREP 3D PRINTERS UNLOCK PROFIT INSTANTLY

Discover how investing in large format additive manufacturing (AM) can revolutionize your industrial business, driving innovation, efficiency and significant cost savings with BigRep's advanced technology.



INTRODUCTION



Discover how investing in large format additive manufacturing (AM) can revolutionize your industrial business, driving innovation, efficiency and significant cost savings with BigRep's advanced technology.

Investing in large-format additive manufacturing (AM) is a move to modernize industrial businesses and create the cost efficiencies that new technologies herald. BigRep's additive manufacturing systems offer reliable and flexible functionality that creates massive savings across industries and applications.

The benefits of large-format additive are proven at nearly every stage in production processes: increasing opportunities for innovation, working environments, and production speed. But all these benefits serve one bottom line – creating cost efficiencies for businesses.

RELIABLE LARGE-FORMAT MANUFACTURING

BigRep develops industrial 3D printers with high-quality German-engineering to ensure the quality systems that industrial users need. Where many large-format 3D printers are simply larger versions of desktop printers, BigRep focuses on developing systems that cater to the unique needs of producing large-format parts.

Producing parts in full-scale often requires days of printing to complete, so successful production is all or nothing. When large-format prints fail late in the process, it must restart entirely – wasting significant productivity. Where engineering-grade materials are needed, their abrasive qualities wreak havoc on lower-quality printer parts, causing increased degradation and risking more downtime more often. It's vital that manufacturers invest in high-quality systems capable of meeting their demands to avoid unnecessary failures and delays.

BigRep's industrial additive systems are specially designed for large-format parts from the ground up for customers whose businesses demand high-quality around-the-clock performance. JC Steele experienced the benefits of BigRep's high-quality industrial printers first-hand when they began building an entirely new set of heavy, dry extrusion machinery. They needed flexible additive manufacturing that would be dependable through nearly constant operation time.

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Lars Bognar - Research Engineer,
Ford Motor Company

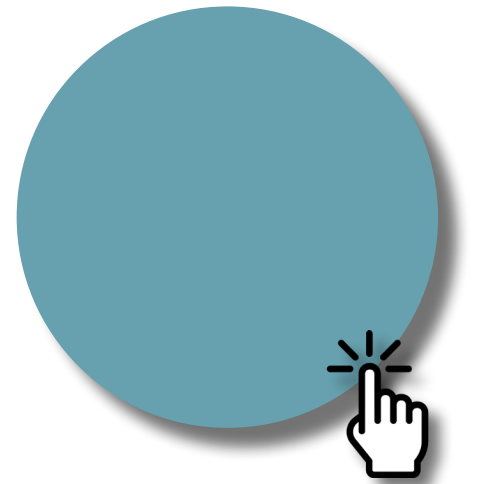


“The BigRep printer has been running 24 hours a day, seven days a week for almost a year.” JC Steele's pattern shop supervisor, Chris Watts, said. ***“We have guys who come in on the weekends and change the materials or start a new build.”*** he added, continuing to say that after two years of nearly continuous use they've yet to have a maintenance issue with their BigRep printer.

FAST RETURNS

Faster, Cheaper Production

Outsourcing large-format parts is prohibitively expensive as a supply strategy, with prices as extreme as \$30,000 for a single large-format part to be produced externally. Even when parts are produced internally using traditional methods, industrial giants like **Ford Motor Company** have found their investment in a BigRep additive system returned very quickly. ***“After two or three successful prints, the BigRep printer was already paid for,”*** said Lars Bognar, a research engineer at Ford. That’s returned value in far less than a financial quarter from bringing an industrial manufacturing solution in-house to enable fast, flexible production affordably. ***“That was a huge success story. We’ve now invested in the BigRep PRO because the need for large-scale additive manufacturing increased over time and we needed a machine that can produce even more.”***



Secure Timeline

By bringing the production of complex parts in-house with additive manufacturing, businesses not only save on high markups but also ensure the security of production timelines. When dealing with third-party producers for important production, businesses place their productivity in the hands of external players. Lead times can be excessively extended by these outside

companies’ unforeseen complications or just poor planning. Waiting for externally produced parts can be disastrous if they create a workflow bottleneck and can even derail a planned time to market. By bringing production in-house, businesses are in full control of their own productivity and can easily ensure timelines are maintained as planned and get products to market faster.

HIGH EFFICIENCY

Hands-Free Manufacturing

The decision to invest in a large-format 3D printer instead of smaller systems comes down to how efficient, self-sustainable, and hands-free production should be. Without a large-format build volume, users must adhere smaller parts together to create full-scale representations. Though it's a common practice for prototyping, adhering smaller parts together doesn't take full advantage of additive technology. Instead, manual adhesion keeps significant manual labor in prototyping and other production processes and limits the time and labor savings created by additive technology.

Steelcase eliminated the prototype outsourcing that caused excessive bottlenecks and increased their efficiency by a staggering 90% with a method that's five times less expensive.

Functional Additive Prototyping

In most cases, parts can't be adhered with the strength required for functional parts, so the resulting products are only a representative visual model. "You don't really understand what a piece of furniture means in the real world until you have it in full size," said Michael Held, Director of Design at Steelcase. ***"One of the things that's really amazing about BigRep is that you can create full-scale samples."***

By investing in BigRep's large-format 3D printers, **Steelcase** eliminated the prototype outsourcing that caused excessive bottlenecks and **increased their efficiency by a staggering 90%** with a method that's **five times less expensive**. Steelcase has since invested in another BigRep printer to continue scaling their additive applications.

FLEXIBLE PRODUCTION

Small-Batch Manufacturing

A significant advantage of large-format additive that's often overlooked is its flexibility in producing not just full-scale parts, but also small-batch manufacturing. ***"We make a whole range of parts, from something that can fit in your hands to something bigger than your car,"*** said Jeremy Kauffman, JC Steele's Engineering Manager, as he explained why a large-format printer delivers the flexibility they need. ***"If we need a large quantity of a smaller part, I can nest 100 parts on the BigRep printer that I can only fit a few of on another."***

Sequential Printing

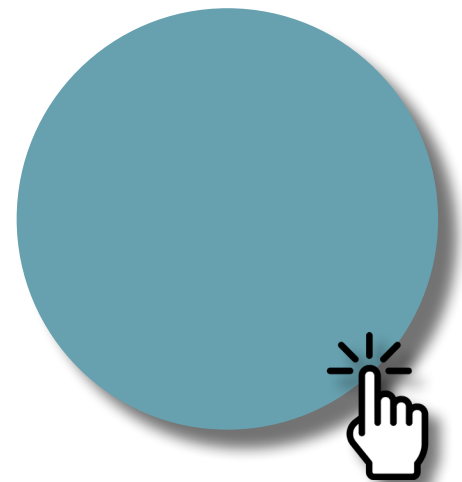
Massive build volumes combined with advanced digital solutions make BigRep printers an indispensable tool for companies that need production flexibility. Features like sequential printing – a method in which prints with multiple parts are carried out one after the other instead of simultaneously, layer by layer across the build volume, like most 3D printers – ensures that urgently needed parts can be produced quickly on demand without significantly delaying other planned production.



EASY OPERATION

Unlike many industrial technologies, additive manufacturing systems don't require specialty operators. The operation of BigRep's large-format 3D printers is safe and easy, similar to the operation of a CNC machine. BigRep offers detailed training courses for operators of any background or skill to ensure users have a deep understanding of their BigRep printer and can easily produce high-quality full-scale parts.

A BigRep additive system won't come with the ongoing expense of specialty operators that some heavier reductive production technology does. Instead, businesses can take comfort knowing that operating BigRep's systems is easy, with simple training for smooth transitions to new operators.



***“ The BigRep printer has been running 24 hours a day, seven days a week for almost a year. We have guys who come in on the weekends and change.* ”**

Chris Watts - Pattern Shop Supervisor,
JC Steele

ADDED VALUE

Small-Batch Manufacturing

Because of its unique flexibility, users have found BigRep systems to be a great solution for unexpected needs.

Boyce Technologies, for example, took advantage of their BigRep's small-batch production capabilities to produce end-use parts, diverging from their originally intended use.

"At the beginning, we understood 3D printing as primarily a prototyping tool," Ajmal Aqtash said, Boyce Technologies'

Director of Advanced Robotics.

"That quickly shifted into production." Because their BigRep printer excelled in its end-use applications, Boyce has shifted its usage to 90% end-use part production and 10% prototyping, saving massively on part production by taking advantage of their large build volume like an assembly line, and invested in a BigRep PRO.

Facility Problem Solving



For others, unexpected savings have been entirely unrelated to their bottom line. At Ford, concrete foundations were protruding through to their production floor. As the production team moved around vehicles, these short obstructions would scratch their rims.

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Ajmal Aqtash - Director of Advanced Robotics,
Boyce Technologies

"They had this problem for years, or even decades, and didn't come up with a solution," Bognar said. ***"They weren't willing to pay a lot of money for a case."*** Using their BigRep printer, Ford printed soft covers for the protrusions with a TPU filament, finally solving the issue affordably.



FUTURE READY

BigRep systems are developed with a forward mindset. **We're determined to ensure that investing in your business with BigRep systems will create high returns for a long time to come, and easily scale to growing needs.** That's why BigRep's Innovation Consultancy, NOWLAB, pushes the limits of additive manufacturing by developing design strategies, like generative design, to create unprecedentedly efficient workflows and systems.

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What BigRep offers is more than 3D printers. We work closely with our customers to deliver custom-fit solutions that optimize their processes. "We've established a close partnership with BigRep during the last two years," Bognar said of BigRep's relationship with Ford. ***"We are working closely together to improve the usage of their products. In some cases, it's even a co-development."***

We've introduced specialty BigRep filaments tailored to our customer's large-format applications and partnered with clients to improve our next generations of 3D printers. **We listen to our customer's needs and work with them to find optimal solutions to create high-value returns from BigRep's large-format additive systems.**

THANK YOU

FINDING MANUFACTURING PARTNERSHIPS

Not only are their large-format additive systems a great fit for Ford, but they're also finding a strong partnership in working with BigRep's Germany-based team.

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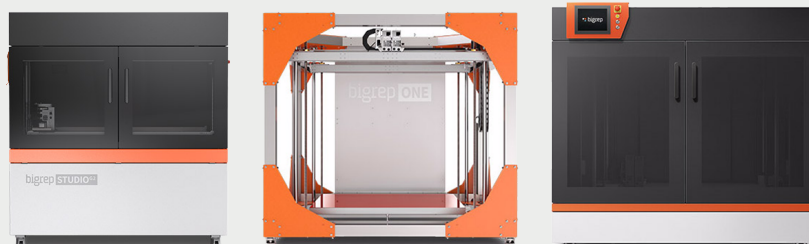
That relationship allows Ford to gain earlier access to the specific tools they need to continue streamlining their operations. As the team at Ford Research & Advanced Engineering Europe has been finding, advances in 3D printing are leading to advances in operations, and that's big for automotive.

Bognar's team at Ford experienced ROI for their system by implementing its first application, quickly proving the new investment's value.

"After the first successfully implemented applications the good news spread very fast internally," Bognar said. ***"Since Ford is a big company with many different departments, the machine is now running 24/7. That's why we bought the BigRep PRO."***

Investing in another BigRep machine underscored the benefits Ford realized from the first. The newer machine, the BigRep PRO, offers the same large build envelope with more advanced features. With the ability to print abrasive, engineering-grade materials, the BigRep PRO is designed for creating functional prototypes, composite tooling, and end-use products – making it a nice fit for Ford and for the automotive industry.

For more information about BigRep's 3D printers visit: **bigrep.com**





REDEFINING **ADDITIVE**

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