

YOUR BEGINNERS GUIDE TO ADDITIVE MANUFACTURING (AM)



ABCorp3D
Secure since 1795

Manufacturing Reimagined

At ABCorp 3D, we believe innovation begins where imagination meets possibility. Additive manufacturing (AM), often called 3D printing, isn't just transforming how products are made; it's redefining what's possible in design, performance, and production.



Whether you're an engineer, a designer, or simply someone who loves seeing ideas take shape, this guide will help you see what's possible and why so many teams are rethinking production through a new lens.

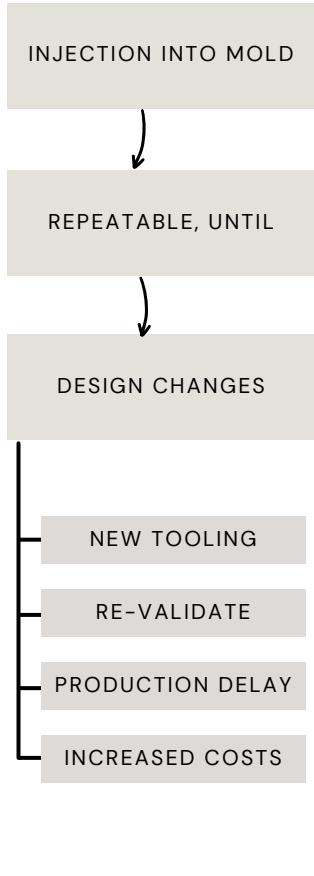
Let's explore how additive manufacturing is shaping the next generation of production.

How Additive Manufacturing Differs from Injection Molding

Injection Molding

Traditional injection molding injects molten plastic into a metal mold and is all about repetition. It's dependable and efficient at scale, but not exactly nimble. When a design changes, new tooling must be made. And complexity comes at a price.

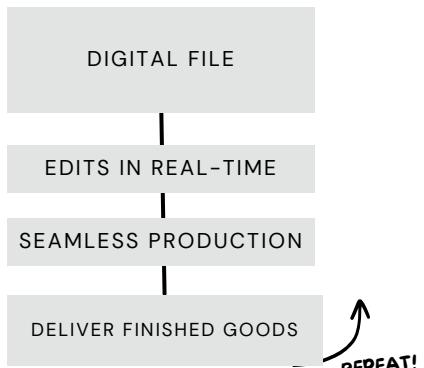
Tooling is expensive, design changes are slow, and complex shapes can be nearly impossible without specialized parts.



Additive Manufacturing (3D Printing)

Additive manufacturing flips that model. Building parts layer by layer from a digital design removes the need for molds and tooling. Curved geometries and lattice structures that once felt impossible are now simple. Edits happen in real time.

Production becomes **faster, leaner**, and far more **adaptable**.



In short, AM shines where creativity, agility, and precision matter most.

The Ten Advantages of Additive Manufacturing

1. Design Freedom

AM breaks traditional design barriers, enabling curved lattices, integrated hinges, and complex assemblies.

Why it Matters:

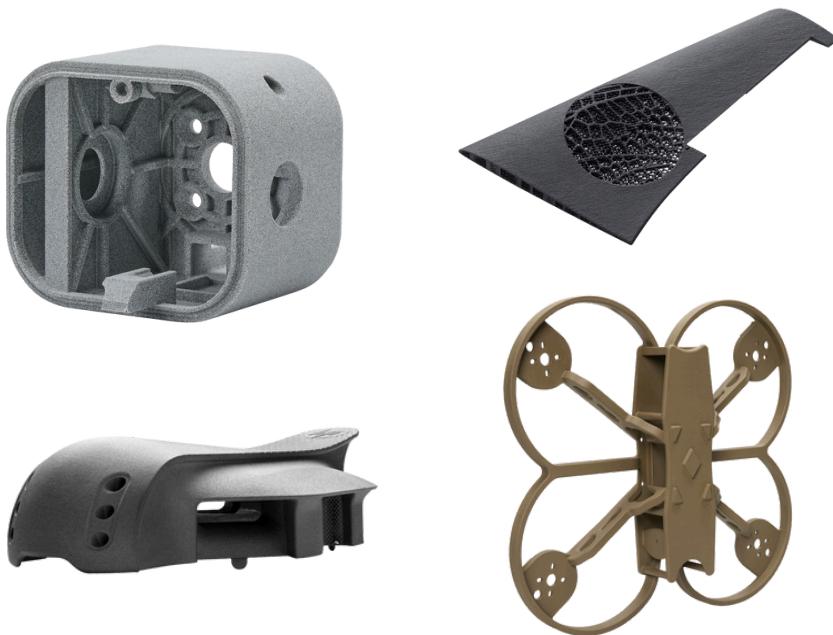
You can design for performance rather than be constrained by tooling limitations. Even at thousands of units, if you can't replicate the function without specialized tooling or many sub-parts, AM remains the smart path.



2. Part Consolidation

One of the simplest yet most impactful advantages of AM is the ability to combine multiple components into a single part.

What once required assembly, fasteners, adhesives, or welding can now be printed as a single structure.



Why it Matters:

Each connection point removed means less assembly, less risk of failure, and less cost over time.

Especially in high-reliability environments (aerospace, medical, robotics), the cost of assembling or inspecting joints can outweigh the per-part cost of AM.

3. Tool-less Production & Rapid Iteration

AM removes one of the biggest barriers in traditional production: the need for tooling.

With AM, there are no molds, no dies, no waiting weeks for a change.

Designs move directly from digital concepts to physical parts in a matter of days.

Why it Matters:

Perfect for prototypes and pre-production runs, allowing teams to test, refine, and launch faster.

Whenever your design is still evolving, AM often wins.

Prototype

Refine

Launch

4. Mass Customization



AM makes personalization possible. Since there's no tooling required, every part can be uniquely designed, adapted, or scaled without adding time or cost.

Why it Matters:

Products can now fit people, not the other way around. A prosthetic socket can be tailored to a patient's body, and a consumer brand can offer products designed for individual style or comfort, all without disrupting production flow.



5. Lightweighting & Material Efficiency

Additive manufacturing enables engineers to design smarter. By placing material only where it's needed for strength, stability, or thermal performance, AM delivers parts that are dramatically lighter and more efficient, often reducing weight by 30–60%.

This precision also drives sustainability. Because parts are built layer by layer, AM uses only what's required, minimizing scrap and waste. Many processes even reuse unused powder or material, making efficiency part of the production cycle itself.

Why it Matters:

Lighter parts mean longer battery life, faster speeds, and reduced fuel use, while smarter material utilization lowers costs and environmental impact.

In every sense, AM helps manufacturers do more with less, ultimately supporting both sustainability and cost reduction.



6. Bridge Manufacturing

AM doesn't just accelerate design; it bridges the gap between prototype and full-scale production. When tooling is still in development, or when volumes don't yet justify a mold, AM steps in to keep products moving forward.

This flexibility allows manufacturers to meet demand without delay, making it the ideal solution for manufacturing. It helps teams stay agile and responsive during transitions, new launches, or unexpected spikes in demand.

Why it Matters:

It provides immediate production while molds are being built or validated, offering seamless continuity.

No downtime, **no** missed opportunities, and **no** disruption to your customers.



7. Digital Spares & On-Demand Parts

Instead of filling warehouses with spare parts, you can store designs digitally and print them only when they're needed. Shifting from physical to digital inventory enables a leaner way to manage resources.

Why it Matters:

This approach keeps supply chains agile and responsive. No more waiting on long lead times, obsolete parts, or expensive minimum order quantities. If a replacement or component is needed, it can be printed on demand.



8. Supply Chain Resilience

In a world where global logistics can shift overnight, AM offers something traditional methods can't: true manufacturing agility. By producing parts where they're needed, when they're needed, AM helps organizations strengthen their supply chains.

Why it Matters:

AM brings manufacturing closer to the point of use. This localized approach not only cuts lead times and shipping costs but also protects against disruptions, tariffs, and material shortages.

9. Advanced Tooling & Inserts

From jigs and fixtures to mold inserts, AM enables faster, smarter, and more capable tooling solutions, ultimately enhancing quality and increasing throughput.



Why it Matters:

Traditional tooling can take weeks or months to refine.

With AM, high-performance tools can be produced in days, often with built-in features such as weight reduction or optimized geometries that improve cycle times and product consistency.

10. Certified Quality for Regulated Industries

Today's AM materials and processes meet the same demanding standards required in aerospace, medical, and industrial environments, delivering parts that are trusted, repeatable, and ready for performance.

Why it Matters:

Through rigorous testing, workflows, and certified materials, AM now achieves consistency comparable to traditional manufacturing, resulting in trusted, repeatable performance at scale.

Case Study: Redefining Precision

ABCorp 3D's Curling Head Project

When designer Brad Carlson partnered with ABCorp 3D to improve the curling head used by Team USA Paralympics, the goal was clear: increase performance, lower cost, and bring a new level of precision to the sport.

Using HP Multi Jet Fusion (MJF) additive technology, ABCorp rapidly produced and tested nine design iterations in under 24 hours. Each version improved performance, leading to a final part that increased stone rotation from 3.5 to 4.5 turns.

Turnaround time dropped from 15 days to 3 days, while production **costs were cut in half**.

Read more on these results [here](#).



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“My excitement of the new curling head is overwhelming. I could not have done this without the ABCorp team. Quality and experience shined when working with ABCorp’s team,”

-Brad Carlson

This project shows what's possible when technology keeps up with human ingenuity.

Manufacturing Without Limits

At ABCorp 3D, we're not just printing parts, we're reimagining possibilities. AM is expanding the boundaries of what can be designed, built, and delivered. It's faster, cleaner, and more capable than ever before.

For those just stepping into this world, start with curiosity.



Every innovation starts with a single idea, and we're here to help you bring your imagination to life.



Contact us to today to discuss the possibilities.

www.abcorp.com/3d

