

# Additive Manufacturing Success through Simulation



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**A**dditive manufacturing, also known as 3D printing, is capturing the imagination of the international business world – and with good reason. The ability to manufacture highly customized parts has the potential to significantly reduce production costs and materials waste, while improving customer satisfaction and profit margins. Additive manufacturing also supports product innovation and market responsiveness, because designs can go from a digital file to a finished product in mere minutes.

In today's world of hyper-competition, many leading businesses focus on winning sales by catering to customers' individual needs. Additive manufacturing supports mass customization by allowing fundamental designs to be easily adjusted to include highly specific features or different materials compositions. This not only helps consumer products companies develop customized offerings cost-effectively but, for example in the healthcare

industry, it means that medical devices can be easily fitted to individual patients' bodies to improve outcomes.

While metal additive manufacturing holds incredible promise to deliver strategic and financial benefits, today it is primarily used by large corporations, like aerospace firms, with sophisticated product designs. With their need to design products with highly complex geometries, composed of high-endurance materials mixtures these companies are logical first adopters of additive manufacturing.

However, as the cost of entry is lowered – primarily due to less expensive metal additive manufacturing equipment – more companies will explore the promise of 3D printing. To do so, they must

new challenges. Engineers can now use simulation to determine not only how their product design will perform under real-world conditions, but also exactly how that design will print on a specific machine. Everyone involved in the production process, from the designer to the machine operator, can collaborate on a common technology platform and share complete visibility into the additive manufacturing outcome.

To make this vision a reality, ANSYS has developed extensions to its flagship simulation solutions for additive product design while also introducing new tools specifically aimed at optimizing engineering and production processes associated with additive manufacturing. ANSYS customers can enter the world of additive manufacturing with a

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manage a number of practical challenges. These challenges include adopting new workflows, accommodating unfamiliar production parameters, and eliminating production errors and waste. This last challenge is not an insignificant one: The cost of additive manufacturing powders is currently much higher than traditional materials. A failed printing job can be surprisingly expensive.

But there is good news. Just as simulation has been optimizing traditional engineering and production processes for more than 40 years, simulation is evolving to meet these

low level of risk, because they are leveraging a familiar industry-leading technology – and using the proven power of simulation to protect their profit margins.

This issue of *ANSYS Advantage* highlights some of the new simulation capabilities that support metal additive manufacturing, along with success stories from customers who are already capitalizing on this new production method. We hope this magazine will help you think about how simulation-enabled additive manufacturing can become a competitive advantage for your own business. 