



RISING UP THE SCALE

Why 3D printing is the future of mass production in China

Additive manufacturing (AM) – or 3D printing – has developed as a radical alternative to traditional manufacturing methods.

But despite being a popular method used at the prototyping and testing stages across many industries, AM is still rarely used for large-scale production. The technology's maturity remains low in most of the industries in China, and therefore it is presently slower and more costly than traditional mass production methods.

However, as the technology continues to develop over the coming years, goetzpartners anticipates these challenges to become less impactful. AM in China will shift from prototyping to small-volume production, then to large-volume production in the long-term. As the industry approaches this turning point, it is crucial for new market entrants to understand the emerging areas for AM application, as well as the ongoing educational challenges.

Innovated in China

goetzpartners estimates that China's AM market size will reach more than €4 billion by 2025. In addition to an increase in the technology's popularity, the market development is also being caused by support from the Chinese government.

The Chinese government sees AM as a key technology within the innovative manufacturing sector – the growth of which is the subject of the "Made in China 2025" policy. It is estimated that 30 per cent of the AM industry's year-on-year growth in China is supported by the government.¹

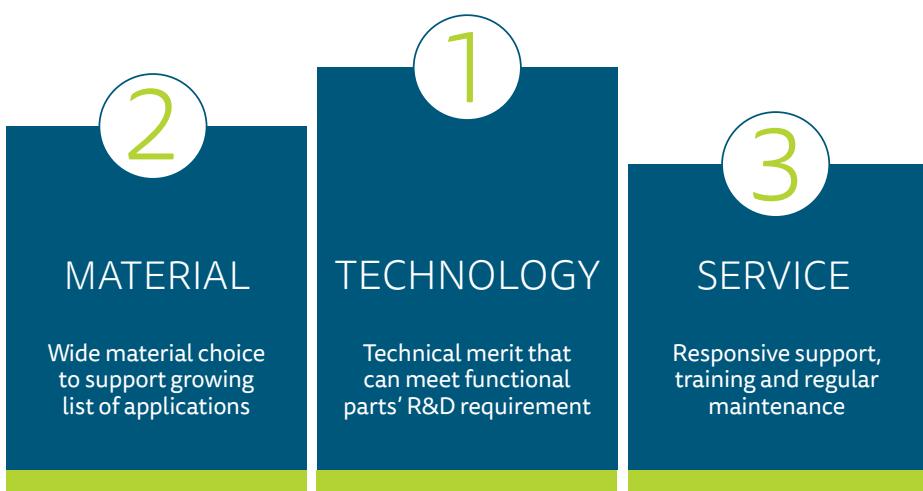
A diverse customer base

Aerospace and healthcare currently have the greatest demand for AM methods respectively in China, which is why maturity of the technology is highest in these sectors. And alongside those, electronics, automotive and robotics are all significant growth areas for AM.



The Chinese market for 3D printing offers dramatic sales potential while being highly competitive. It is only with a clear, localized AM strategy that multinational corporations can succeed here.

KEY CRITERIA FOR AM APPLICATION



In the automotive industry specifically, the electric vehicle sector is currently showing substantial interest in AM, as its pursuit of lightweight materials is well suited to the method's capabilities. Therefore, the technology could move to the core of large-scale production methods in the automotive industry by 2025. Volkswagen has recently announced that it plans to print select parts such as gear knobs and it would mass produce structural parts using AM within two to three years.

The leading options

As industry applications for AM will develop to become more commonplace, it's increasingly clear that certain technologies within AM – specifically, selective laser sintering (SLS) and selective laser melting (SLM) – have huge growth potential over alternative methods. In China, SLS and SLM are showing a 20 per cent year-over-year growth rate on equipment. This trend can be attributed to the methods having higher precision and a wider choice of material options.

The capabilities of SLS and SLM are highly sought after in the automotive industry, with complex customisable parts such as alloys and interiors being very well suited. SLS in particular has huge potential in consumer goods and fashion. Leading players such as Nike, Adidas, and Under Armour are all applying AM on small-volume mass production for their sports shoe lines.

Challenges in perception

The Chinese AM market is highly competitive, but there are opportunities. On the lower end of the market, the technological barriers are not high for new players, but the market is saturated. Whereas at the higher end, leading technological expertise is essential, yet the number of competitors is significantly lower. Local players at the lower end are anticipated to increase their market share as they catch up technically while maintaining a low product price and developing a customer-centric service.

Despite these opportunities, the biggest challenge for the industry is customer perception, as there is a hesitancy for AM to be considered for larger scale pro-

duction. This is mainly because mass AM is currently slower and more costly than alternatives, but also because customers aren't aware of AM's full benefits. goetzpartners finds that the most successful AM suppliers in the face of these educational issues spend a lot of effort educating downstream clients on how to apply the technology, and often provide consulting services as well.

Pick the right moment

goetzpartners expects the unit cost of AM production to decline by 25 per cent CAGR over the next five years. As the technology develops to become an increasingly cost-effective option, AM MNCs should work to identify the inflection point at which their service offers a compelling volume for mass production. AM multi-national companies should target industries with strongly emerging interest in AM method's capabilities, i.e. automotive, electronics, and robotic part suppliers. Regarding low AM maturity status, corporations should start approaching local manufacturers 2-3 years in advance to build their knowhow in 3D printing and become technologically competitive.

MASS PRODUCTION ON A TINY SCALE

China as leading AM market

The Chinese AM market will grow by an estimated 18 % from 2015 to 2025 – the largest increase worldwide. The biggest demand for AM is in the aerospace and healthcare sectors – where AM maturity is highest.

AM maturity in healthcare

Within healthcare, AM offers dentists a more precise process than traditional plaster method when making teeth, and one that is also far more cost-effective. Although price is still a challenge for the AM market today, goetzpartners estimates that AM production is cheaper than traditional injection moulding methods when the production volume is 50,000 or less.

4 STEPS TO AM SERIAL PRODUCTION



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