

# PLASTICS Q&A

**3**D printing—also known as additive manufacturing—got its start more than 30 years ago, but according to David Woodlock, market development, 3D printing business at HP Inc., it has not yet reached its full potential. Woodlock is focused on growing the 3D printing industry, using design and business innovation to enable large-scale digital production and manufacturing. He sat down with the Plastics Industry Association to discuss the future of 3D printing plastics in appliance manufacturing and how this technology continues to impact the industry.

## What is the biggest benefit of using 3D printing in manufacturing?

One of the major benefits of using 3D printing in manufacturing is the ability to create geometries that are impossible to create using traditional manufacturing technologies. This has great implications in both manufacturing and design, because 3D gives the ability to physically arrange and integrate parts in a way that maximizes the yield and cost-effectiveness of each production build.

## How does that benefit translate to appliance manufacturing?

This is of great benefit in producing fluidic parts (e.g. manifolds, ducts, valves in washing machines) due to the difficulties of injection molding those types of parts. Most often, you can replace the assembly of several different parts with a single 3D-printed part, which makes digital manufacturing faster and more cost-effective.

## Are there any trends in appliances that could be influenced by 3D printing?

With the massive re-urbanization that's been happening in many parts of the world right now, the demand is growing for products that take up a smaller footprint in the home, without having to sacrifice functionality. Using 3D printing to manufacture com-

plex singular parts allows engineers to create products that are smaller and more dense.

## What's new in 3D printers? How are these machines changing to meet the market's needs?

The biggest change is the shift from prototyping to full manufacturing. HP has been leading this global shift with advanced 3D printing technology and an Open Platform model for materials that reduces costs and speeds innovation, bringing us closer than ever to industrial-scale 3D manufacturing. Traditionally, 3D printing has been a prototyping tool, but from its inception the mission of HP's 3D printing business has been to drive the analog-to-digital transformation of the \$12 trillion global manufacturing industry. We're bringing the 3D-driven part performance, quality, cost structures and scalability that will allow manufacturers to escape the limitations of injection molding in the world's all-digital future.

## What are some of the biggest challenges manufacturers face with 3D printing plastics?

The biggest challenge I see for manufacturers isn't the actual process of 3D printing itself, it's the organizational and paradigm shift required. Injection molding has become so firmly planted in how we think about designing and manufacturing products that almost every level and department in an organization will have to undergo some level of change to truly realize the full benefit. But that digital transformation is critical for the longevity of all companies and all industries.

## What's the key to realizing the full potential of 3D printing in manufacturing?

We have to change the way designers think, procurement buys, and management leads. The old rules of product design will no longer apply because the role of the 3D designer will be elevated to divining cus-

*3D Printing:  
Faster and More  
Cost Effective*



David Woodlock

*David Woodlock, market development,  
3D printing business at HP Inc.*

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tomers needs, and creating entirely new systems to meet them.

### What's the next big thing in 3D printing plastics?

The ability to create different properties within a single part. The first substantiation you'll see of this is full color. Beyond that, we've made parts where select areas are electrically conductive, allowing us to print real circuitry in the middle of a plastic part. We can also do things like modulate the mechanical properties of the material, creating areas of a part that are more or less stiff than others, for example.

### How is 3D printing influencing design?

Voxel-level control (voxels are the tiny 3D pixels that serve as the DNA of HP's Multi Jet Fusion technology) is the future of design, and at HP, we've already started to put the tools in place that allow a new generation of digital innovators to use them and keep reinventing manufacturing's future.

### How is it influencing manufacturing as a whole?

All of the current megatrends in manufacturing point to the advantages that 3D printing brings, like flexible manufacturing, shorter development cycles, distributed production, and mass-customization.

### What are the most impactful applications of 3D printing for appliance manufacturers?

- ▶ Smaller, more cost-effective, and better-performing products
- ▶ A "digital inventory" of spare parts that will eliminate the need to physically transport or storehouse them
- ▶ Easier late-stage differentiations
- ▶ Shorter development cycles and, ultimately, a quicker time-to-market.

### What will the role of 3D printing in manufacturing be in the next 10 years?

Adoption of 3D printing across all industries will keep accelerating, pushing the digital reinvention of manufacturing forward, beyond traditional methods like injection molding. ■

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