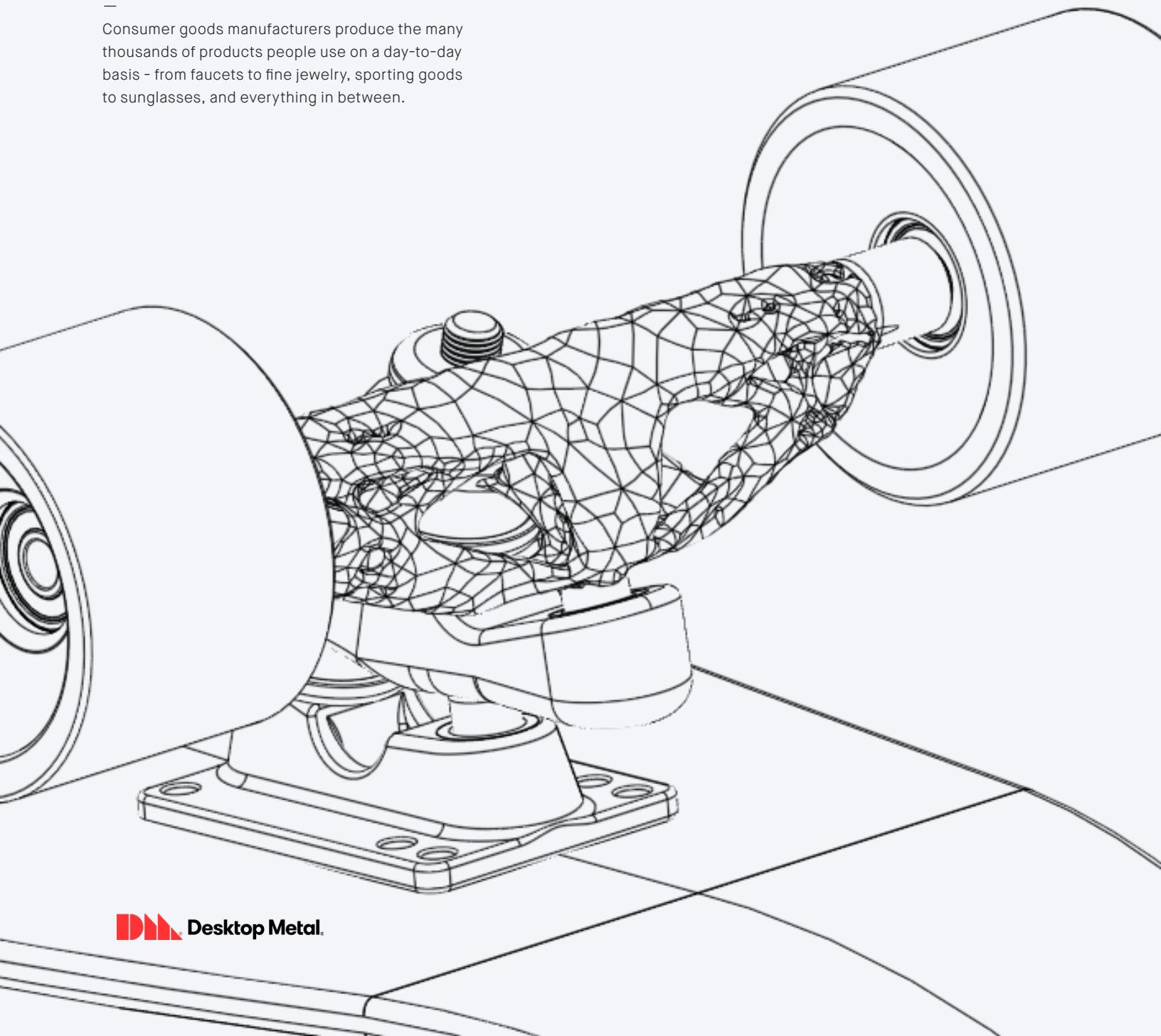


Consumer Goods

—
Consumer goods manufacturers produce the many thousands of products people use on a day-to-day basis - from faucets to fine jewelry, sporting goods to sunglasses, and everything in between.





Challenge

While many consumer products are produced by the hundreds of thousands, requests for small volumes of highly-customized parts are a constant for most manufacturers.

Due to the high cost and long lead times associated with fabricating tooling, traditional production methods - like injection molding, casting, forging or metal injection molding - are simply infeasible for these low volume requests.

Those tooling challenges also apply to prototyping. While companies may want to create multiple prototypes to test for functionality, market demand or to iterate on designs, it can take weeks or months to fabricate prototypes using traditional manufacturing methods.

A golf club, for example, may be progressive die forged in high volume when it enters mass production, but first must be extensively prototyped to refine the exact design before investing in extensive tooling. The result can be both delays in bringing a product to market and significantly increased costs during the prototyping stage.

When products do go into mass production, the expense and labor associated with fabricating tooling often combine to significantly drive up both part cost and manufacturing lead time, resulting in higher costs to consumers.

For certain manufacturers, like jewelers or others that work with precious metals, the challenge is related to the material itself.

The high cost of raw materials make subtractive methods inefficient because even a small amount of scrap material can be very costly.



Solution

By eliminating the need for tooling, additive manufacturing makes it easy for companies to produce highly-customized parts in low volumes - simply modify the design file and upload it to the printer. Within days, parts are ready to be shipped to customers, and new designs can be sent to production.

The tooling-free nature of metal 3D printing also makes it far easier and faster to create prototype parts. Manufacturers can create and test multiple versions of a part, each with subtly or vastly different geometries, and quickly refine designs to arrive at a final part.

When tooling is needed, additive manufacturing is an ideal solution.

With the ability to create complex geometries that would be difficult - if not impossible - to create with traditional methods, 3D printing allows manufacturers to quickly create highly complex tooling like molds, stamping dies, jigs, fixtures and more. This ease of producing tooling results in shorter lead times, and also makes it easy to produce replacement tools on an as-needed basis, reducing manufacturing downtime.

The additive nature of 3D printing means material is only placed where it's needed, meaning there is very little waste - a key consideration for manufacturers that use precious metals or other costly raw materials.

Part Examples



[A] GRIT Wheelchair Lever Connectors

The all-terrain wheelchairs manufactured by Grit are powered entirely by the user - making weight reduction, strength, and stiffness critical to performance. Traditionally machined out of aluminum in custom low quantities, these lever connectors typically require a multiple week lead time.

Printing on Fiber in fiberglass-reinforced PA6 enables shorter lead times, reduced weight and greater customization - all while increasing part strength and stiffness.



[B] Curling Whip

The shape and weight of the whip are critical to the athlete's performance. Plastic alternatives often break during competition and machined aluminum requires long CNC milling lead times and labor.

Fiber enables the rapid production of custom whip geometry, while continuous fiberglass reinforcement provides a lighter and stiffer alternative to aluminum.

Part Examples



Printed with Fiber™

[C] Surfboard Fin

Printing on Fiber enables rapid functional prototyping of the many variables that affect surfboard performance - the fin's rake, cant, base length, height - and greatly speeds the process when compared to traditional hand layup.

Composites are ideal for this part due to their high strength. In this case, the part is made from PA6 nylon with fiberglass reinforcement to keep costs low and to resist corrosion.



Printed with Studio System™

[D] Skateboard Trucks

Generative design and 3D printing allows for the fabrication of innovative designs impossible with casting (the traditional production method for skateboard trucks).

The Studio System can print that previously impossible geometry, resulting in trucks that are more aesthetically pleasing, stronger, and lighter.

Part Examples

[E]



Printed with Studio System™

[E] Jewelry

Unique jewelry pieces can be 3D printed without the design lock-in, long lead times and costs associated with tooling.

The Studio System's high resolution print head produces small parts with fine features and surface finish.

[E]



Printed with Studio System™

[E]



Printed with Studio System™

Part Examples

[F]



Printed with Studio System™

[F]



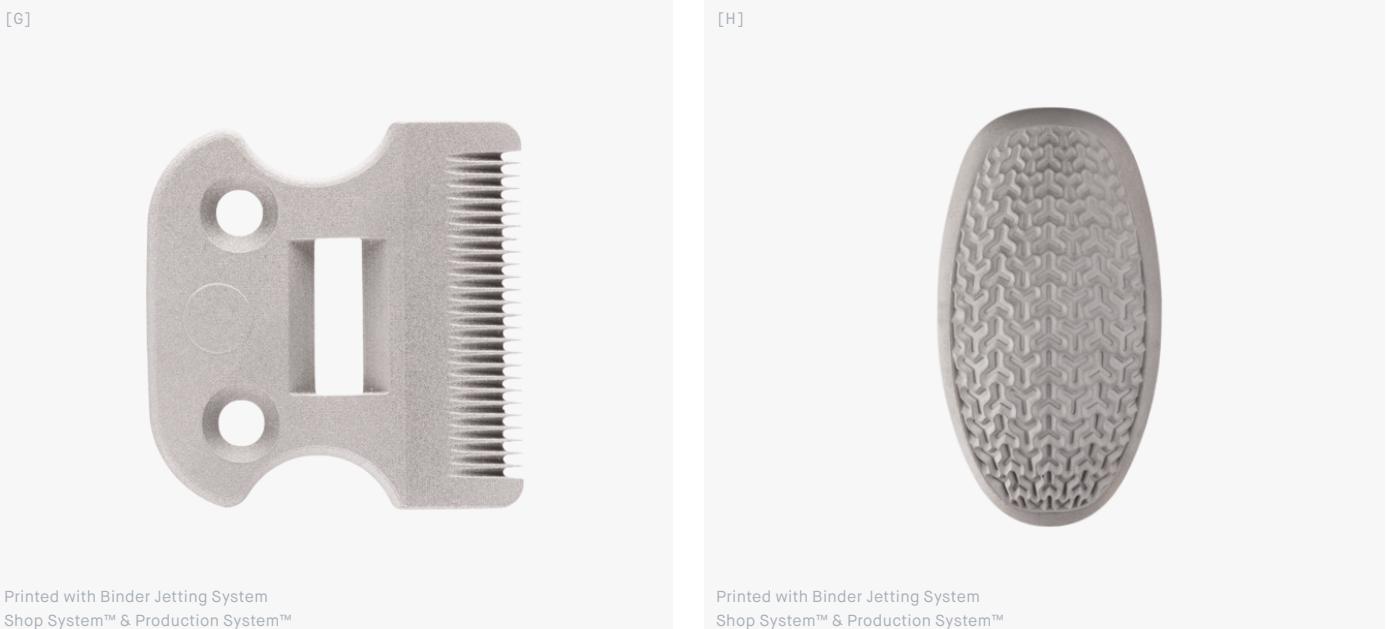
Printed with Studio System™

[F] Golf Clubs

Golf clubs, especially putters, are typically forged or machined. With the Studio System, manufacturers can achieve excellent material properties without tooling or expensive CNC machining.

The Studio System allows for customization of parts like putters, so each player can have a design that is best suited to them. And when those designs go into mass production, they can be manufactured via binder jetting.

Part Examples



Printed with Binder Jetting System
Shop System™ & Production System™

[G] Clipper Blade

Manufacturing this clipper blade would traditionally require expensive tooling for production via stamping or metal injection molding. Mass producing on the Shop System eliminates tooling costs and drastically reduces manufacturing lead time.

Furthermore, additive manufacturing enables mass customization - allowing real-time adjustments to the part.

[H] Gear Shift Knob

On demand manufacturing of custom knobs is enabled with the Shop System - expanding design flexibility and avoiding warehousing costs. The short manufacturing lead times allows for many custom knobs to be produced with a variety of different designs.

Printing on the Shop System also allows for a dramatic reduction in cost compared to traditional manufacturing methods.

Part Examples



Printed with Binder Jetting System
Shop System™ & Production System™

[I] Shank

This part has many different possible geometry options, all will affect the performance of the end use part.

By printing this part on the Shop System the geometry can be constantly iterated on, rather than having to commit to a design when hard tooling is created for a manufacturing process such as metal injection molding. This helps to minimize risk and leads to a better part design.

Similarly, by using the Shop System the secondary sharpening step on each of the shanks is greatly simplified, leading to a lower part cost and reduced manufacturing lead time.

Part Examples



Printed with Binder Jetting System
Shop System™ & Production System™



Printed with Binder Jetting System
Shop System™ & Production System™

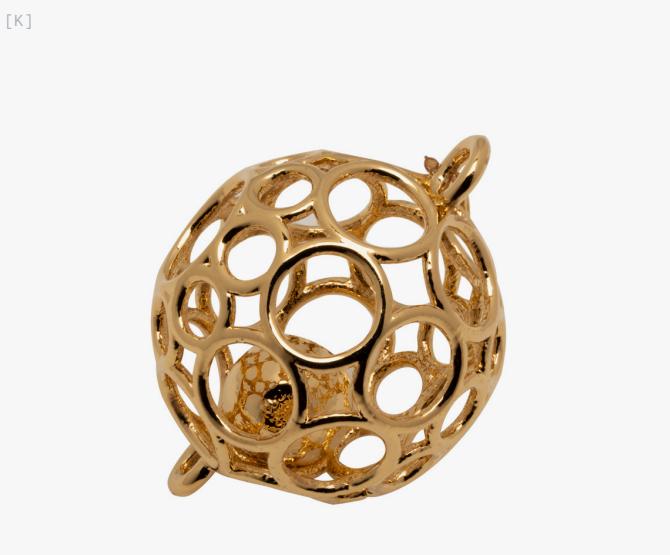
[J] Earrings

The Shop System also opens the door to new levels of creativity in the design of jewelry like earrings. Though they have been made and worn for nearly 5,000 years, different manufacturing methods have had a significant impact on how their design has evolved, and additive manufacturing is no different.

These two earrings designs feature internal cavities that are enclosed by the part. To produce these designs via traditional manufacturing methods, the wires would need to be precisely woven before being attached at the ends, a process that would be too slow and expensive to justify.

Since the Shop System prints in a bed of powder these internal cavities are supported throughout the entire printing process allowing for their easy fabrication.

Part Examples



Printed with Binder Jetting System
Shop System™ & Production System™



Printed with Binder Jetting System
Shop System™ & Production System™

[K] Decorative Hardware

Metal hardware - clips, snaps, hooks, ornamentation - may be considered secondary to the overall design of many products, but it is often a key opportunity for differentiation and branding.

For many brands, metal ornamentation serves as a key design detail, garnering recognition and generating additional value. While lower-tier goods often rely on off-the-shelf hardware due to cost constraints, luxury brands opt for custom designs to signal value and exclusivity.

The Shop System makes it easy to incorporate features, like sweeping, organic shapes, internal cavities and precisely interwoven parts, that would otherwise be difficult - if not impossible - to produce.

Custom metal ornamentation can also be used to elevate consumer goods packaging and cosmetic products by incorporating unique design features that signal quality and prestige. This ornament features a ball encapsulated in the center of the outer casing, a design that would be impossible to produce with traditional manufacturing techniques, but which the Shop System can produce with ease.



Printed with Binder Jetting System
Shop System™ & Production System™



3434 RT 22 West, Suite 130, Branchburg, NJ 08876
Phone: 866-277-8778 • www.cimquest-inc.com

Copyright © 2020 Desktop Metal, Inc. — All rights reserved.

www.desktopmetal.com