

THE NEW NORMAL



Custom Manufacturing Is A Sound Business Model

"We're really excited to be using 3D printing for Normals because that is what allows us to get the personalized fit to the customer in as little as 48 hours, at a price point that makes sense for us and the customer."

—Nikki Kaufman, Founder & CEO, Normal

One of the many color and hardware combinations offered by Normal.

As children, we learn in science class that everyone in the world is unique, that our distinctive combination of DNA makes us who we are. But the traditional business model of mass manufacturing doesn't address that individuality. As a result, we have learned to accept, and even embrace, the concept of one-size-fits-all products.

But Nikki Kaufman has a different idea.

As the Founder and CEO of Normal, Kaufman believes that the creation of customized products on a mass manufacturing scale can be the basis for a sustainable and profitable business model. It was with this thought in mind that she started Normal, a manufacturer of customized, 3D printed earphones that are created and delivered to customers in as little as 48 hours.

The company's concept was built on Kaufman's own frustrating experiences with ill-fitting, painful earphones. As she looked for alternatives, Kaufman discovered that no two ears are the same, even on the same person. In other words, it's "normal" for our ears to be unique.

Her search ultimately led her to a process offered by audiologists in which silicone is poured into each ear to make individual molds. The molds are then used to create customized earphones that are shipped to the customer several weeks later at a cost of up to several thousand dollars.

"I knew that there had to be a better way. I began to wonder if I could make customized earphones with 3D printing," said Kaufman.

TAKING CUSTOM TO A NEW LEVEL

Through Normal's mobile app, or in-store at the company's factory and flagship retail location in the Chelsea district of New York, customers take photos of their ears. Then, they select the



Nikki Kaufman, Founder & CEO of Normal

color of their earphones from seven proprietary colors of ABS thermoplastic, as well as the color of various hardware components, and color and length of the cables.

Once an order is submitted, each pair is engineered, manufactured, assembled on-site, and delivered anywhere in the U.S. in as little as 48 hours. Ten FDM® 3D printers from Stratasys® line the perimeter of the store so customers can see the process by which their earphones are created firsthand. The entire assembly line is in full view from the retail store via floor-to-ceiling windows; the transparency of the manufacturing process adds another element of customer engagement that is practically unheard of in most industries where products are made behind closed doors.

The finishing touches are added when a Normal team member etches the customer's name into a carrying case that has been laser-cut to hold that specific pair of earphones.

It's a unique product and process that is marketed as "one size fits none."

But what about the sound quality?

Kaufman says that customers get terrific sound as well as terrific fit. The earphones feature 14 mm neodymium dynamic drivers, a frequency response of 20 Hz to 20 kHz, 109 dB per mW sensitivity, a total harmonic distortion of less than 1 percent, and 32 Ohm impedance. There is also a three-button remote on the cable and a gold-plated 3.5 mm jack for plugging into an audio player.

3D PRINTING IS THE CORNERSTONE

Kaufman celebrates the role 3D printing plays in bringing Normal to life. The technology enables the company to deliver premium, custom earphones in a way — and at a price — that traditional manufacturing methods have not been able to achieve before.

"We're really excited to be using 3D printing for Normals because that is what allows us to get the personalized fit to the customer in as little as 48 hours, at a price point that makes sense for us and the customer," said Kaufman. "It also allows us to be super agile with the color selections, the post-processing and all of the finishing touches we do to make Normals personalized to fit your ear."

And because 3D printing is such an important part of the Normal process, Kaufman knew immediately which brand she wanted to purchase.

"I was already familiar with Stratasys 3D Printers, so I knew they were the ones I wanted to use because they would give us the high resolution quality, the ease of use for our employees and the speed required to produce a premium-quality, mass-produced consumer product."

After all, anything less wouldn't be Normal.



The store front for Normal in Chelsea, NY.



One section of the display area that features two Stratasys 3D Printers. A total of ten 3D printers are incorporated into the store's design.

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