

The Making of the Nike Fuelband

Whipsaw on collaborating with Nike and the making of the Nike Fuelband

Dan Harden · June 6, 2015



A New Market

The Nike+ FuelBand exemplified Nike's inspiring mixture of brand experience and dedication to athletic performance. Not only did it help to invent a market segment, it also pushed the boundaries of wearable styling, engineering, technology and manufacturing alike. Nike approached several consulting firms with a challenge to conceptualize a wrist-worn input device from a visionary rendering to production. The basic configuration of a minimal band-like device proved to be compelling, the individual requirements challenging. Having them all in one product seemed nearly impossible: a miniaturized sensor laden band with a hidden display, 3 sizes with micro-adjustments and an integral USB clasp, enough battery life to last 1 week, discrete on the wrist and engineered to withstand the rigors of real sport. Not a single area of this device could be left under-engineered.

Working with Nike

We were very fortunate to have been selected as Nike's engineering partner responsible for the Mechanical Design and New Product Introduction (NPI) for the development of the Nike+ FuelBand and FuelBand SE. The process was a collaboration with a wide range of highly talented organizations and individuals, with the Whipsaw engineering team at the forefront to bring the device to life. As with most great products, the end result is a work of deceptive simplicity. The unit presents as a thin, plain, black, opaque band with no detail at all, but with the press of a single button it comes to life with a sparkling LED matrix, a rainbow of color and motion.

The real achievement with FuelBand was getting all this to work in such an elegant form factor with so much functionality. This was our formidable contribution, and here is what we went through to make it all happen.

Architecture and Manufacturing

With a tight development schedule to take this fantasy product from concept to production, the key was creating a product architecture and manufacturing strategy that would hide the complexity of this remarkable device. Like all things FuelBand, the architecture and the manufacturing processes became intricately intertwined, leading to a multi-material flexible frame supporting a flexible circuit, all to be encased in thermo plastic rubber.

Initially, we were unable to attract the attention of large contract manufacturers to make the device, so we forged ahead in an attempt to locate the smaller, risk-taking suppliers who would ultimately help us invent plausible manufacturing processes for an “electronic wrist band” (the term “wearable” was barely used at this time). Through a series of simulations and prototypes, we proved to ourselves that we could actually embed an entire motion monitoring circuit and LED display in molten plastic, without destroying any of the components. Along with our electrical engineering partner, we ventured off to China to perform our first proof of concept tests. With a surprising amount of quick success, we took our findings back to the Nike product development team and pushed towards our first fully functional prototypes.

Moving forward, it became even more important to challenge the boundaries of product engineering and manufacturing. No longer were we only concerned with the “simple” task of over-molding a circuit on a wrist formed frame. Now we had to add the complexity of curved lithium batteries, a miniature latch mechanism hiding an integral USB plug, an integrated/over-molded button ... while making the whole assembly water resistant.

Coming to Life

During the production of those first functional prototypes we also got our first glimpse of the inherent magic of this new device. However, we knew we had many more challenges on our hands and given the tight schedule, we leveraged the advice of experts as much as possible to confirm key assumptions – many of which were proven untrue. While the process was angst ridden, our recovery from setbacks had to be lightning fast. We set out to methodically solve the problems that could be solved within the scope of the initial functional prototypes. In some cases the correct solution had to be pushed into the next release, which also happened to be the mass production design. Ultimately we were able to create a set of functional prototypes that wowed both engineering and management teams. Next step: mass production design in 3 sizes, small, medium and large.

New product launches are not for the weak of heart. As consumers, we take for granted the amount of intelligence and sweat that goes into the development of the devices we rely on every day. Mature products have the advantage of generations of development knowledge but the creation of a groundbreaking new product faces obstacles at every turn. For many months Whipsaw and Nike engineers were deployed to Asia for weeks at a time, the long hours and frustrating results making team members long for home and cheeseburgers. Yet the tantalizing vision of a revolutionary product helped keep our team motivated and inspired, along with that rapidly ticking clock.

Overcoming Challenges to Build Something Great

An ever-mounting list of issues had to be overcome before this product could be shipped. To make the FuelBand as small as possible, every aspect had to be

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define what dignity controlled actually means. Even the weather conditions dramatically affected our yields. In addition, the 3 sizes presented their own unique issues that seemed technically impossible. Fortunately, with the combined efforts of the engineering teams, and the support we received from Nike management, we were able to continuously overcome the issues and keep our foot on the gas.

Drawing closer to launch, our product quality improved substantially and with only a few remaining problems, we knew we were on the verge of a successful product launch. However, with the FuelBand being a tightly integrated device, it remained a challenge to isolate and address recurring issues without affecting other areas. Living with the device for several months we now felt in tune with the process and knew instantly when performance started drifting. The manufacturing engineers' constant vigilance on tightening process parameters throughout the supply chain brought us further ahead, and the test engineers, who fully embraced the limits of the term "don't shoot the messenger", were able to bring back reports of success. Even production line workers and supervisors had critical input on resolving some of the more intricate issues.

A Triumphant Occasion

On February 22, 2012, Nike+ FuelBand finally shipped. It was immediately embraced by the public and hailed as a harbinger of "wearable" things to come. This miniature wonder captured everyone's imagination. Smooth, light and flexible, it offered a form and function that was utterly original. It felt natural and easy yet its simplicity belied its considerable utilitarian value. It also represented a sea change in how a miniature electronic device could be engineered. Molding hot translucent rubber directly over all the electronics and display, leaving no air inside the device, was a crazy idea that worked. Creating a multi-step material lamination within a 7 mm thickness that provided strength, bend-ability, and water resistance, was a crazy idea that worked. Integrating the USB into an adjustable metal clasp was a crazy idea that worked. So many innovations went into this product. FuelBand was made possible by hardcore engineering problem solving, collaboration, and a passionate goal to actualize Nike's radical product vision.

Many designers and engineers get into this field because they want to work on products that positively impact the lives of individuals. After seeing countless friends, neighbors, strangers, and celebrities proudly wearing FuelBands, we feel very honored and fortunate to have been an integral part in the development of such a groundbreaking product. As the landscape in the fitness wearables market continues to shift, we will look back fondly on our time to help bring this trend setting product to life and our continued commitment to push the assumed boundaries of what is possible.



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creative force and luminary in the design world. Dan's passion and experience combined with his personal philosophies about art, culture, psychology, and technology permeate the work.

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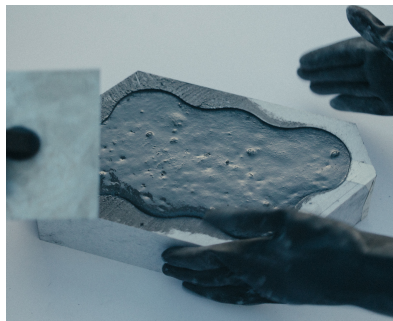


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