

# THE TIMBERLAND COMPANY

## Timberland Saves Time and Money, Finds the Right Style with 3D Printing



- **Timberland** – Global leader in the design, engineering and marketing of premium-quality footwear, apparel and accessories
- **Challenge** – Obtaining more shoe prototypes sooner to better evaluate comfort, performance and marketability of new designs
- **Solution** - Using the ZPrinter®310 and, later, the Spectrum Z™510 System to print out prototypes on demand
- **Results** - Dramatic reduction in prototype costs and turnaround time, resulting in more prototyping, better designs and increased revenue

“In our industry, the pressure is always intense to quickly and affordably turn the marketer’s vision and the consumer’s taste into reality that performs well, feels good and looks great. Z Corp. printers have done exactly that for us, compressing our design cycles, lowering our costs and helping us produce better products for our customers.”

– TOBY RINGDAHL  
COMPUTER AIDED DESIGN MANAGER  
TIMBERLAND COMPANY

The Timberland Company (NYSE: TBL) has transcended its humble workboot origins to become one of the hottest lifestyle brands on the planet. Whether for work, recreation or dressing up, every Timberland product is a compelling blend of form and function tailored to the needs of every customer. That’s why it’s important for engineers and marketers in the \$1.5 billion New Hampshire-based company to collaborate closely in the development of every product, from initial concept to prototype to sample and, ultimately, volume production.

### Challenge

#### Getting Affordable Prototypes Quickly

The shoe must look good, feel good and perform well. While the upper is mostly fashion design, the intense engineering comes in where the foot meets the insole and where the outsole meets the street. Engineers continuously refine concepts for arch support, tread patterns, materials, heel stabilizers, orthotic devices and “lasts” (i.e., foot models) in computer-aided design (CAD) software.

As recently as 2002, Timberland hired professional model makers to turn 2D CAD drawings into 3D prototypes in wood or foam. These prototypes typically took a week or more to create at a cost of \$1,200 each. The lead time hamstrung the company’s ability to refine their models to their satisfaction in a timely manner. As a result, the company regularly lengthened its design cycle or just lived without the refinements it wished for.

“Time and money aside, the problem with the old approach is that a 2D CAD drawing left too much to the imagination,” says Toby Ringdahl, computer-aided design

manager in the company’s footwear product development and engineering group. “When the prototype was finally ready, it wasn’t exactly what people imagined. But a week is a long time to wait for a new iteration.”

Timberland realized it needed more prototypes sooner. The company assigned Ringdahl’s team to spend six months evaluating rapid prototyping options.

### Solution

#### 3D printing In House

After weighing alternatives, Timberland chose the ZPrinter 310 System from Z Corporation, determined to be the fastest and most affordable 3D printer on the market. The low cost of printing materials and the speed of the machine pushed it ahead of rapid prototyping machines from Stratasys, Objet and 3D systems.

In 2005, Timberland took the next step by investing in the Spectrum Z510 System, the first high-definition color 3D printer on the market, providing 24-bit color and 600 dpi resolution. Z Corp. has the only technology that can print parts in full color, which communicates design information far more effectively than monochrome. Color can be used not only to produce a lifelike object, but for stress analysis, product labeling, or to highlight key parts or revisions.

### Results

#### Better Prototypes Faster, Cheaper

The Spectrum Z510 accepts CAD files from Timberland’s 3D mechanical design software and produces physical models affordably and quickly. The performance has made a substantial impact on Timberland’s efficiency and spending.



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- A more-than-30-fold reduction in prototype cost
- An overwhelming reduction in prototype creation time, from a week to 90 minutes
- A 33 percent reduction in design time
- Better communication of design intent through color
- Closer collaboration between design & marketing professionals
- Increased sales now that representatives use real 3D prototypes instead of 2D sketches

For example, a prototype that used to cost Timberland \$1,200 now costs \$35. A prototype that used to take a week to make now takes 90 minutes, enabling engineering and marketing employees to collaborate more often and more closely. And printing out rapid color prototypes onsite has enabled Timberland to compress its typical design cycle from three weeks to two.

The Spectrum's large build area delivers additional time savings. Since it is larger than the ZPrinter 310, engineers can print full-size prototypes flat on the build area instead of on an incline, saving three hours of printing time on such jobs.

Spectrum's speed and efficiency has directly resulted in continuous product quality improvement. In the weeks Timberland recoups by no longer waiting for prototypes, it can pump out dozens of iterations of a shoe design if it needs to. As a result, more designers, engineers and marketers can see more products in a shorter amount of time, helping Timberland refine its footwear for fit, function and style. “We can now quickly do innumerable iterations and variations,” Ringdahl says, “and the designers and marketing managers can really be sure the product is what Timberland is expecting and what people on the street are demanding.”

The investment in Spectrum also eliminates major ancillary costs late in development, like time-consuming trips around the world to examine important shoe molds in overseas plants. Since Timberland can now reach consensus for designs on 3D physical models, there's no longer any need for a careful examination of the production shoe mold.

Finally, color is a key benefit. It better conveys design intent, and the Spectrum's unparalleled resolution enables details like lugs on the sole, speed hooks on the upper, and tiny print on the sole to show up perfectly. “The closer the prototype

is to real life, the less you leave to the imagination,” says Ringdahl. “Unfortunately surprises are eliminated.”

## Results

### Higher Sales

While 3D printing seems at first glance like an engineering tool, it's making a direct impact on company revenues in two ways: One, close collaboration among designers, engineers and marketers brings to market a product that is exactly what the market demands. That means more sales. Two, Timberland sales people occasionally bring prototypes to sales calls with major retail chains, giving them a big advantage over competitors who come with only sketches. In these instances, sales people can land large sales earlier.

“Products that would have been dropped because of ho hum 2D drawings are being successfully adopted because customers can hold multicolor, real-life prototypes in their hands,” Ringdahl says.

Timberland expects to reap additional benefits from 3D printing in the future. Engineers will use shape analysis software and the Spectrum Z510 System to print prototypes that call out pressure points and interference in the insole.

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