



THE MAKE: MANUFACTURING TAILORED FOR FACTORIES OF THE FUTURE

BY EMILY WALZER

A NEW MANUFACTURING MINDSET IS EMERGING THAT BODES WELL for domestic production. Invest, collaborate, ideate, communicate, and educate are fast becoming modern fundamentals for success in today's marketplace defined by speed and specialization.

Work lines built on efficiency and flexibility are the new norm. Solving production problems by teaming digital resources with physical components is leading edge. Maker spaces, incubators and alliances with academia are taking shape to engage next gen thinkers and build community.

Nowadays thinking "niche" is big and customization key. An entrepreneurial spirit is energizing manufacturing models and lending fresh perspective to how goods get made. Conventional business models and hulking textile plants are phasing out and fast being replaced by micro factories streamlined to transform ideas into commercial product in no time.

"We get orders Monday morning and can ship Monday afternoon. If a customer needs fabric tomorrow we can put it on a plane and get it there. That's our model." Jeff Bruner, Quantum

Textile suppliers, brands and individuals are investing in innovation with gusto. Companies are doubling down on technology and equipment to out-pace market forces and accept the needed rise in digitalization, automation and robotics.

"Over the past five years, we made significant investment with our infrastructure. It's about speed, particularly with knitting. It was invest or die." Steve Perry, Darlington Fabrics

Education is central to this mission. As of 2015, U.S. government basic research funding had dropped to only 44 percent, from a high of 70 percent in the 1970s. Corporations are stepping up, realizing

that tapping into student talent will pay off down the road.

"We will gain talent from the university. This will help us train the next generation of chemists and engineers." Zeru Tekie, Chemours

For an industry once content to compete within their separate silos, collaboration has taken hold. Company execs now describe the importance of listening, connecting, researching and developing with customers. This is happening all along the supply chain, from large players to small.

"The goal is to streamline communication from molecule level to the mill partner." Cindy McNaull, Cordura

Companies also find value in hiring from outside the industry to bring innovation in. Be it from automotive, high-tech or consumer products, manufacturing going forward will consist of designers sitting next to engineers and software gurus sharing lunch tables with yarn experts.

"After leaving IBM and beginning my new career at DTV I saw opportunity to bring Lean concepts to this enterprise." Kirk Smith, Darn Tough Vermont

Thinking differently is the new attitude. Execs believe we are on the forefront of a new made in America. Indeed, these days automated machinery complete with high tech computer systems goes hand in hand with personalized innovation. Young entrepreneurs especially don't want to adopt models they view as what pushed production overseas.

"People have been frustrated long enough and want to do things differently. They do not want to continue on that same path." Kim Ortengren, Wallace James Clothing Company

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Investing in Innovation

Investment has allowed Westerly, RI-based Darlington Fabrics to compete with Asia mills that have brand new everything, explains Steve Perry, president. It was a gutsy financial decision because while there was lots of discussion about bringing manufacturing back, Perry estimates there was maybe 25 percent commitment at the time. “We felt we had to take the plunge. We’ve had some wins along the way and since 2013 we’ve had a significant uptick in business.”

New hardware also brought a new collaborative outlook at Darlington. A good example is a partnership with Nitic, a third party color certifier that has boosted efficiencies. “At least two weeks are shaved off the lead time,” states Darlington’s Carol Gross. “It’s all done digitally. We don’t lose time submitting color lots; we are pre-approved to ship.”

Working together with other domestic vendors to fill gaps in the U.S. supply chain has also proved beneficial. “We don’t live in our respective silos anymore,” says Perry who values membership in the American Apparel Producers Network (AAPN) and also gives a shout out to a fledgling local Rhode Island Textile Innovation Network (RITIN). “The textile community has figured out that being in individual silos is not beneficial.”

These days the firm is experiencing growth in niche businesses. While activewear remains a sales driver for Darlington, success in non-apparel applications like post surgical wraps, braces and industrial end use is on the rise. Perry states, “I’m more optimistic about the textile industry than ever before.”

Investment is part of the DNA of Quantum, a North Carolina company that has been ahead of the curve in its innovation model. “Everything we do is custom,” states Jeff Bruner, company founder and chief technology officer. “Because of this we don’t have a manufacturing facility that has standing looms or machines waiting for the next order. Each and every loom is dedicated to a specific customer or project.”

Bruner’s problem solving approach dates back decades when he saw an opportunity to invent a new fabric technology – synthetic elastomeric suspension fabric – that helped launch his business, and continues to fuel sales today in new applications. He states, “To be a leader and on the forefront of innovation, you have to be fast, willing to take risks and collaborate with customers to understand their challenges. Our customers are the key to our success – we see them as partners and because the way our manufacturing platform is set up, at times, can be considered an extension to their operations.”

To that end Quantum has invested in R&D, acquired new technologies and even made custom machine modifications to streamline production as part of the collaborative process with a customer. This effort resulted in reducing a four-step process into one machine at Quantum’s facility.

With Quantum’s ability to create cutting edge performance knits and wovens that feature attributes like breathability, durability and stretch, the company is finding traction in the active/outdoor market. Quantum has a joint patent with adidas, and has recently applied for patents of its own regarding a new technology for woven constructions

and one for 3D knitting, both incorporate features including “zoned support,” suitable for a range of different sport applications.

Like textile suppliers, brands, too, are embracing manufacturing methods to meet market needs. Kirk Smith, director of manufacturing, has been leading the way with LEAN training at Darn Tough Vermont, in Northfield, VT. Smith came to Darn Tough after a 33-year tenure with IBM holding a number of positions within engineering and manufacturing both as an individual contributor and management positions. “My last seven years at IBM were spent working on the Lean Transformation Team as IBM realized to remain competitive we needed to do something different,” Smith explains.

Lean 101 training kicked off in May 2016 with VMEC (Vermont Manufacturing Extension Center) providing the training facilitation. Over the course of the next 12 months 100-150 employees trained in Lean 101. Additional training in problem solving and value stream mapping also occurred and taking place while Darn Tough doubled employee population.

“To expand depth of understanding we also started book clubs where groups of employees would have weekly reading assignments and then come together to discuss the material,” says Smith, adding, “It really must be a cultural system running through every department and touching every employee. It is the way the organization does its work.”

Last fall the company formally launched the DTPS (Darn Tough Performance System) and are moving forward to construct “pillars” which support how work gets done. To this point this effort has been achieved in Safety, 5S, Continuous Skills Development, Continuous Improvement, and Supply Chain Optimization.

Educational Endeavors

Industry partnership with academia is a long-standing tradition. According to the Association of University Technology Managers (AUTM) industry introduced roughly 900 new products to the market



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in 2015 based university innovations. And over the past 20 years, research institutions have earned more than 80,000 US patents, states the organization.

Creating strong relationships with local universities continues as a recent announcement from Chemours confirms. The chemical company is launching The Chemours Discovery Hub, a state-of-the-art research facility at the Science, Technology and Advanced Research (STAR) Campus of the University of Delaware.

The \$150 million, 29,000-square-foot facility is slated for completion by 2020 and the long-term partnership looks to help Chemours meet emerging customer needs, satisfy new market demands and deliver high-value chemistry.

Chemours' primary STAR focus will be chemistry and chemical engineering research, Zeru Tekie, Chemours' global technical director, Fluoroproducts, says. Beyond that, "We are looking to collaborate with the College of Engineering and the College of Arts and Sciences for physics, material science, and mechanical engineering. Many of our programs are going to need expertise in these fields, so we'll need this key collaboration. We cannot overstate the value and importance of collaboration to innovation. Diverse groups of people bring different perspectives and ideas to solve the same problem."

The STAR Campus will also give Chemours a site for collective entrepreneurship. Everyone will be in one place working together in a more collective approach to advancing innovation.

Cordura, in addition to its affiliation with North Carolina State University's College of Textiles, is now expanding its collaborative platform with a newly created, dedicated "maker space" at the company's Kennesaw, GA headquarters. Currently known as the Cordura Innovation Center, the hub will tie directly to Cordura's corporate Destination Durability storytelling and its theme.

The Innovation Center will showcase a fabric library, a product library, numerous displays, trend boards, and basically everything

needed to ideate, says Cindy McNaull, Cordura's global brand marketing director. "This all has to do with the evolution of Cordura. We have so many fabrics now and so many more applications that we needed a dedicated space. The carpet bag was just so big." Indeed, there are more than 1800 Cordura fabrics and the library list is growing every day.

Solving problems, identifying unmet needs, and then creating product to meet those needs is the contemporary philosophy that spurs innovation. "This kind of connectivity has been happening virtually, but now we'll be able to do it in person at the Cordura Innovation Center," explains McNaull, who outlines these fabric development trends Cordura believes drives innovation today: Light yet Strength; Sustainability Innovation; Natural Empowerment; Extreme Resistance; Denims Durability; and Active Soft Strength. The new Cordura Innovation Center will push these elements by working with designers, mill partners, brand partners.

Acting as a solution provider also relates to Kim Ortengren's incubator/factory in Portland, ME. Although on a much smaller scale than big textile players like Cordura and Chemours, Ortengren's company, Wallace James, serves as a launching pad for innovation.

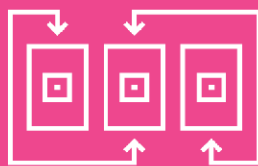
Wallace James is one of roughly 50 founding members of Maine Outdoor Brands, a newly formed alliance composed of an assortment of companies united in a mission to promote local entrepreneurship and inspire growth in Maine's \$8.2B outdoor recreation economy. Maine Outdoor Brands made a successful debut at the recent Denver show where its busy booth throughout trade event proved a good indicator of today's strong "localization" trend and brand community connection.

Ortengren's business is about many things, though providing infrastructure, solving production problems and creating new ways to make goods are central. The year-old company can facilitate everything from initial sizing and pattern grading to small run production, complete with fully automated machinery that feature high-tech computer systems.

Education plays a big role. "It's not just cut and sew," says Ortengren, who returned to her home state after a stint in 7th Avenue fashion followed by work at Cloudveil, Spyder, and Crane & Lion in Boston. "A client has an idea, but no idea how to make it. For us it's 50/50 thinking/making. We set clients up with a foundation," states Ortengren. "Primary for us is not faster to market but the education component so its done correctly the first time around. Communication and clarity go a long way."

Her business model is paying off. Wallace James has established a steady client base and has tallied successes in its first year, with highlight achievements including helping expedite fabric sourcing and streamline production for local designers as well as on-the-mark fabric development for established brands in a timely manner.

"I don't believe I could I have been doing this five years ago," says Ortengren. "We are on the forefront of the new thinking about made in America. People have the capital now. People have been frustrated just long enough to want to things differently." ●



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