RFID in the textile industry - Malden Mills uses RFID technology for quality control - Datalogic

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Are form-fitting ensembles made with plastic bottles the new wave of fashion? Before you excuse this notion as preposterous, take a good long look at that winter gear in your closet. Malden Mills, a Massachusetts textile company is the inventor and premiere producer of Polartec fabric and clothes. They sell this resilient fabric to commercial leaders like Nike, L.L. bean and The North Face. Malden Mills has been making headlines in the last few years for among other things, ethical business practices in the face of adversity. After the original factory burned down in 1999 the company continued to pay employees their full time wages for an entire year while the new facility was being rebuilt. In addition to these newsworthy ethics, a recent contract with the US Military has also given Malden Mills some well-deserved recognition.

Polartec on the Front Lines

When it comes to outfitting our soldiers, Uncle Sam doesn't look too highly upon compromising quality. Afghanistan, the site of our most recent military endeavor, posed quite a problem when it came to supplying gear for our soldiers. Military contractors needed something that could keep troops warm in some of the harshest hot and cold conditions imaginable, without being too cumbersome and heavy. Polartec fabric has countless advantages over cotton or wool besides being extremely lightweight. Heat retention, easy breathbility, and water resistance add to the beneficial qualities of this fabric. This material is also environmentally friendly, as it is the result of recycled plastic bottles being melted, cooled then spun into highly durable fiber strands

Tying the Knot, With RFID

The production of Polartec fabric begins with a 1700-needle, circular-knit machines (see fig 1). These machines knit fabric strands together at a rate of 25 yards a minute, forming extremely long (roughly 40 yards) pieces of fabric that resemble giant Christmas stockings. The majority of production

problems occur in this initial stage. Realistically any machine that is using 1700 tiny little needles at very high speeds is bound to have one or two occasionally get bent or break. If a needle is bent or broken it results is an imperfection in the material similar to runs women constantly deal with in their pantyhose.

It is at this point that EMS RFID technology comes into play. After the fabric is dyed, it passes through an inspection station then into a slitting machine. The slitting machine cuts the sock down the side, a process operators refers to as “opening up”. Previously, when imperfections were found during the inspection process, operators tied knots in the sock at those places where the fabric was marred. Knot detectors installed on the slitting machines would detect knots, and operators would manually change the position of the cutting blade or take out the damaged material all together. This system was proving very unreliable and costly. In order for the detector to register the knots, they had to be tied in exactly the right way. If a knot was tied incorrectly the system would miss picking it up and the knot could potentially damage the slitting machine. Missing imperfections meant wasting material, and that, coupled with the very high cost of repairing the slitting machines, gave Malden Mills the incentive they needed to update their quality control system.

Shaun Sullivan, Director of Engineering at Malden Mills, consulted Kevin Preston from General Machine Technologies about a type of technology Preston had mentioned before. “Kevin had previously given me some material regarding RFID technology. It was when we were looking for a new ID system that I asked Kevin if he had any ideas for using RFID to solve our problem.” Preston certainly did. He recommended Escort Memory Systems ES650HT read only tags. The ES tags are now used in pairs every time a “run” in the material is found in the inspection station. When a run is located, inspectors take two ES tags and reach into the center of the sock, through the run in the fabric, and attach one tag at the beginning of the run, and the other at the end. The tags are actually sewn into small pockets in the material, and remain there until they reach the slitting and drying station.

EMS’ RS427-04 Conveyer style antennas were installed at the entrance to the drying and splitting station. These antennas are designed to fit in between the rollers of an ordinary conveyer. Once mounted they read RFID tags as the pass overhead, on the conveyer. Malden Mills currently has two of these antennas installed and is using roughly three hundred tags.As the giant pieces of fabric are being drawn in to the splitting station, the antennas read tags. The presence of tags is then communicated via an RS427 cable to the Allen Bradley Host PLC, which instructs the splitter blade to stop. Operators find the initial tag, then rotate the cutting blade so that it is on line with the run. By splitting the sock down the run, no material is wasted, and the imperfections are only evident on the very ends of the fabric, (ends are normally sheared off anyway). Operators then take out the ES tags, and store them for future use.

Sullivan’s team has found RFID to be a very helpful technology, ”We’ve been very happy with the system thus far; using RFID allows us reduce the amount of wasted material. We also have been able to determine through reports how many imperfections are being found, and how much RFID is saving us.” Malden Mills’ innovative use of EMS Technology accurately illustrates the growing trend in supply

chain industries towards time and money saving RFID Data Capture solutions