The Journey of Cotton: An Introduction

Today we're excited to announce a new blog series from Barnhardt Manufacturing Company entitled "The Journey of Cotton." This series will focus on the seven unique steps that it takes to process cotton, starting with the planting of the crop to the point it becomes a specific consumer product. To kick off this new series, we wanted to give brief overviews of each processing step. These overviews only scratch the surface, so this seven-part series will dig deeper into each specific step with more detail.

Here are the seven steps the series will focus on:

Growing

Early each spring, cotton is planted in the southern half of the United States from California to Virginia. Heat and water allow the seed to emerge from the soil around 10 days after planting. The average growing season is 150 to 160 days from planting until harvest, and during that time the farmer uses good practices to make sure the cotton is free of weeds, grass, and insects that could potentially harm the plants.

Harvesting

In late fall, the cotton is ready for harvest (though the harvesting timeframe can vary based on geography). At this point the farmer prepares the plant for picking; the cotton fiber is mechanically removed from the stalk with the use of a cotton picker, and then staged in a

module for transportation to the gin. The key to harvesting is always about timing: a crop must be harvested before poor weather can negatively impact yield, and overall quality.

Ginning

Next the cotton arrives at the gin, where the process of removing the seed, stalk, stem, leaves, and any other VFM (visual foreign matter) begins. Heat is added to the cotton to bring the moisture level down so that it flows through the equipment properly. Then the fiber is pulled from the seed at the gin stand, ultimately passing through lint cleaners where smaller, finer particles are removed from the lint. Once the good virgin cotton fiber is cleaned, it's pressed into a 500-pound block known as a bale. A small hand sample of each bale is sent to a USDA classing office, where the individual fiber properties are tested for such things as length, strength, micronaire, and color. These are factors that ultimately determine not only the value of the fiber, but also what products the cotton goes into.

Purification

Once the baled fiber from the gin arrives at the purification plant, it is staged based on the properties of length and micronaire. The fiber bales are blended with each other and opened into small tufts, and those tufts are opened to individual fibers allowing for any non-lint (contamination from the field and plants) to be removed. The fibers are then placed into a vat where they are wet out and pressed into a dense cake. The cakes go into a kier where the oils and waxes are removed by pumping alkali through the cake to achieve the desired absorbency. Afterwards, the colored materials are removed by using hydrogen peroxide, which leaves a white fiber.

Finishing

After fiber purification, a fiber finish is added to aid in further processing. The fiber is then dried and put into bales, which are used by our customers to produce nonwoven fabrics. Here, there are many possibilities: there are hundreds of possible finishes, and the application methods can vary, too. For example, cotton is hydrophobic, so it is not naturally absorbent. The finishing process can make cotton as absorbent—or nonabsorbent—as a customer desires. Processing can also make the purified cotton fiber more durable or flame-resistant, among other properties.

Nonwoven Manufacturing

Upon receiving the bales, fabric manufacturers like us can open the fibers into small tufts and card (comb) them into a web. These webs can be bonded into fabrics three ways: by mechanically entangling the fibers (through needlepunching or hydroentangling); chemically (gluing the fibers together); or thermally. The latter process works by blending the cotton with thermoplastic fibers (polypropylene, polyester, etc.) and heating them so the plastic fibers melt and re-harden where the fibers intersect. This adds strength to the fiber web.

Conversion into Final Products

In the end, fabrics are converted (cut, shaped, and combined with other components) to produce end products for consumers. Many diverse consumer products are created: feminine hygiene (tampons, pads, and panty liners), disposable baby and adult diapers, disposable wipes (wet and dry), medical products, and even cotton balls and swabs (Q-tips). The array of products that purified cotton can be used in is almost endless.

Look for Our Forthcoming Journey of Cotton Posts

Over the coming months we'll be going into greater detail on each of these seven steps—post by post—so keep an eye out on our blog for updates. Cotton has a long, winding road from the field to the consumer use. The goal of the Journey of Cotton series is to give our readers a better understanding—and appreciation—of how the miracle fiber makes its way into the products we all use each and every day.