

Improving Operating Efficiencies in Broad Woven or Solid Woven Manufacturing

For the PVC and Specialty Rubber Conveyor Belt Industry

Introduction- Engineered Alternative

Today, the yarn of choice for this weaving and coating industry is a staple fiber, most notably polyester. When elevated PIW strengths (Pounds/ Inch Woven) were required, hybrid yarns were introduced to the process. These yarns were usually constructed by wrapping a continuous filament fiber with a roving of staple polyester. The continuous filament is providing the strength requirement, and the staple roving is providing the adhesion and bulk properties. These products have remained as the primary choices to this industry until the introduction of Magic® yarns.

Reasons for Lost Efficiency in the Solid Woven Industry

Lost efficiency in the solid woven industry may occur for the following reasons:

- Yarn Breaks both in the warp & weft.
- Strip-backs of the sheathing on hybrid yarns.
- Down time to clean up the lint build-up created by staple fiber use.
- Increased creeling time due to requirements for left and right twist products.

Yarn Breaks in Both the Warp and Weft- Strength

Spun yarn today can be manufactured in a variety of techniques (open end, ring spun, jet spun). While the equipment has changed over the years, the basic concept that a group of short staples can be orientated to create a yarn bundle has remained unchanged for decades. The consistency of the yarn count and the ability to control the fiber alignment all impact the yarn tenacity. Depending on the manufacturing process chosen, yarn tenacity can vary from 2.5 to 4.6 grams per denier.

Magic® yarns are processed from continuous filament fibers. The surface properties of the yarn are modified so that they resemble the surface properties of staple fibers. Because the process does not depend on the alignment of short staples the resulting tenacity values are considerably higher. Tenacity values can range from 4.6 to 6.9 grams per denier. These values can be modified to your specific requirements. Because Magic® yarns are produced using continuous filament fibers, you will also produce a product that can have modified elongation or shrinkage values.

Strip Backs of the Sheathing on Hybrid Yarns- Stability

These yarns are currently referred to as dreft spun or core wrapped yarns. These products are manufactured by wrapping a roving around a continuous filament core. The purpose of the wrapping is to improve the jacketing adhesion. This wrapping is not fixed to the core and is designed to slide up and down the core face. The problem with this design is that at some point material contact will back the roving up enough so that it will no longer pass through the heddles.

Magic® yarns have the same surface characteristics as dreft or core wrapped yarns. The primary difference is that the individual filaments have had their surface characteristics modified so that a sheathing wrap is not necessary. Because the wrap is not necessary, the possibility of sheathing strip-backs has been eliminated.

Down Time To Clean up the Lint build-up Created by Using Staple Fibers- Integrity

Most weaving operations that produce a product that is woven from staple fibers will stop their looms once a shift to remove fly waste. This waste is created because the yarns are constructed of individual filaments that range in length from 1.25 inches to 2.5 inches. These short fibers break away from the yarn bundle because of abrasion.

Magic® yarns are constructed using filaments that extend over the entire length of the yarn carrier. This manufacturing technique eliminates the possibility of fly waste generation.

Increased Creeling Time Due to the Requirement To Creel Left and Right Twist Products- Torque Neutral

The manufacturing process that is employed to produce staple yarns requires the product to be twisted. All yarns that are twisted will have torque reserve built into the product. To negate this torque reserve, most warps use a combination of opposite twist directions. These combinations result in a balanced finished product. The need for offsetting twist directions forces the weavers to carry two raw materials. Each of these two products has the same nominal count but one will be produced using a left twist and the other will have a right twist. A torque free product will track better in the final product.

Magic® yarns are manufactured using a process that produces torque neutral yarns. Because these products are produced torque neutral, the requirement to carry two raw materials are eliminated. You will reduce your intermediate SKU's by one half. Potential creeling errors will be eliminated.