ITMA 2003- PREPARATION

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ABSTRACT

Wet processing equipment for preparation was reviewed at ITMA 2003. No major innovations were seen, but several interesting offerings are summarized.

Keywords: Preparation Desizing Scouring Bleaching Washing

Introduction

Preparation is the first stage of textile wet processing and perhaps the most significant one since the quality of all subsequent processes depend on uniformly and properly prepared substrates. It has been estimated that a majority of all final fabric defects can be traced back to faulty preparation.

With the obvious importance of preparation processes, it is not surprising that machinery manufacturers only change preparation equipment very cautiously and carefully. As a result, new and innovative preparation processes and machinery are rarely seen. The 2003 ITMA was no exception; only incremental changes were seen in the basic preparation equipment.

One clear trend was noted, however. Manufacturers in Asia are taking European machinery designs and offering lower cost alternatives by taking advantage of their lower manufacturing costs. Another trend was increased focus on elastic fabrics.

Although no significant innovations were present, the following products deserve mention.

Fabric Handling

Tacome, Valencia, Italy, has developed new machinery for loading rolls of greige fabric into continuous processes. The machine allows one operator to load and sew together large rolls of fabric easily and safely. The rolls are entered into the machine with a fork lift and then the rolls are automatically taken by conveyor belt to the sewing station as needed.
Singeing
The first preparation process after weaving is typically singeing. This process removes loose fibers from the fabric surface with heat, improving the fabric’s appearance and presenting a uniform substrate to the subsequent desizing process. Several manufacturers presented new or improved singeing equipment.

Gematex, Aue, Germany, along with Vollenweider, Horgen, Switzerland, form the Xetma group. The Pyrotrop XIS singer is a new development that uses indirect heat rather than direct flames to remove protruding fibers. The longer exposure to heat allows for better temperature control by preheating the fabric prior to fiber removal. The fabric temperature is automatically measured and controlled by varying the flame size and fabric speed. Blends of polyester and cotton can be processed at speeds up to 150 m/min without forming “pearls” of melted polyester on the fabric surface.

Parex Mather, Manchester, England, demonstrated a singeing process for tubular knits. The fabric tube is opened and held on a frame to position the fabric at the proper distance from the burner array. Various tube sizes can be accommodated by easy machine adjustments. Production speeds up to 70 m/min are anticipated.
Desizing, Scouring, and Bleaching

Desizing is necessary to remove the warp sizes that were applied to yarns prior to weaving. Scouring removes the oils and waxes that interfere with proper dyeing, while bleaching removes color bodies from cotton. Both continuous and batch equipment were seen in these areas. Only incremental improvements in the areas of process control and automation were displayed.

Then, Safenwil, Switzerland, introduced a new fully automated batch bleaching system for knits, the Autobleach Air system. The system consists of a bleaching unit and an automated chemical dispensing unit. The operator only has to load and unload the fabric. Total cycle times of 90 minutes are claimed as well as only 12 liters of water consumed per kilogram of fabric.

TMT, Biella, Italy, showed an improved pad, available in a variety of widths and cylinders diameters. The F series pads include redesigned cylinders to provide equal pressure across the entire fabric width.

Tepa, Barcelona, Spain, improved the automation and controls on their continuous and batch open width bleaching and washing ranges. Improved electrical drives reduce power requirements by 30%.
Küsters, Krefeld, Germany, have developed improved process controls and dosing for their line of continuous preparation equipment. Touch screens and online controls increase productivity and consistency. In line mixing of preparation chemicals simplifies formula changes and reduces chemical waste. In addition, significant improvements were made in Turboflush, the continuous wash box system. Improved cloth guides and spreaders allows for lower fabric tensions and permits the use of one vacuum slot design for both knits and wovens. In 2004, Küsters will introduce WashProf, an online sensor that detectors the color of wash water and adjusts water flow to minimize water usage while maintaining desired cleaning efficiency.

Benninger, Uzwil, Switzerland, produces a well-known line of preparation equipment. No changes in their product line for woven fabrics were introduced as Benninger concentrated their development efforts on knit goods, especially elastic fabrics. New washing technology was seen in the Trikoflex washer for open width knits and elastic wovens. This drum washer has close tolerances to minimize curling and a special drive system to minimize fabric tensions.
The Tempacta conveyer can be used for knits or wovens when long dwell times with low fabric tensions are needed in chemical processing. Up to five chemicals can be metered individually.

Menzel, Biellfeld, Germany, presented two pieces of equipment for desizing/scouring/bleaching. They introduced a uniquely designed applicator for wet-on-wet processes. The applicator combines a high efficiency entry nip with a low bath volume in a horizontal configuration with a final nip. This configuration saves space and minimizes fluctuations in bath concentrations from dilution by incoming water on the wet fabric.
The other Menzel introduction was a conveyor steamer with a moving slat conveyor to change fabric-metal contact points while moving the fabric through the steamer. This steamer also allows for combining fabric strands with the conveyor for additional dwell time. Fabric tension is minimized and controlled with individually controlled drive sections.

Noseda, Como, Italy, focuses on equipment for the wet processing of knitted goods. The modular Eltex-W wash line was designed for the preparation of open width elastic knitted fabrics that have not yet been heat set. The equipment provides efficient oil removal with vacuum slots while maintaining very low fabric tension with driven cylinders allowing for complete relaxation of the fabric. A dosing system is provided for pH control.

The Moenus group, Mönchengladbach, Germany, also concentrates on wet processing equipment. Woven fabric is addressed with the new Convi-Tex- F wash unit that can be assembled in modular form to accommodate a variety of installation requirements. The unit includes doctor blades, spray pipes, and counter-flow liquor circulation for efficient washing action and can easily be combined with application, steaming, and vacuum units to form a complete preparation line.
Knit fabric is prepared with Moenus’ Spray-Flow unit that is designed to prepare fabric with minimum tension on a drum dryer with spray pipes and vacuum extraction. High liquor flow and chemical dosing control allow for efficient and economical operation.

The Moenus Store-Tex steamer is intended for knit applications that require dwell times up to 30 minutes. A roller bed conveyor and Teflon® coated spreader minimize fabric tensions during treatment.
**Mercerization**

Mercerization, the treatment of cotton fabric or yarn with high concentrations of sodium hydroxide to achieve increased dye affinity and improved strength and luster, was also addressed at ITMA 2003.

Benninger’s Ben-Dimensa is designed for continuous hot mercerization of both light and heavy weight fabric and includes application, stabilization, washing, and neutralization sections. The unit is designed to operate with low volumes of sodium hydroxide, minimizing change over times between fabric styles. The amount of wash water can be controlled by measuring the sodium hydroxide concentration in the stabilization zone. The fabric is efficiently neutralized through automatic pH control.

Menzel presented a mercerizing unit designed for short runs. The Minimerc is a compact unit that first treats the goods with alkali, then changes the treatment bath automatically to a wash liquor.
Solvent Scouring
Laip, Prato, Italy, introduced an interesting machine for solvent scouring fabric in rope form. The Wash&Dry is a patented unit that was designed to remove oils from elastic fabric and without extensive working of the fabric. The installation includes an automatic solvent recovery and reuse system.

Heat Setting
Heat setting of tubular knits has become a standard textile process. Several manufacturers presented machines designed to heat set fabrics in tubular form.

Icomatex, Barcelona, Spain, introduced the Icofix, a heat setting unit that can treat up to three fabric strands simultaneously with no edge marks.
A unique vertical tubular heat setting machine was shown by Heliot, La Chapelle Saint Luc Cedex, France. The Rollset treats two fabric strands simultaneously in a vertical gas heated chamber. Specially designed adjustable fabric stretchers provide even heat setting without marking the fabric.