

Report on fabrics for testing with Lenpur yarn and Lycra fibre

Threads used

100% Lenpur Ne 40/1 yarn

100% Elastan – Lycra Du Pont 33 dtex D 09 M thread

The Lycra D 09 M is a new generation elastomer that can be heat set at temperatures ranging from 170 to 175°C.

This elastomer makes it possible to obtain elasticised fabrics working at much lower temperatures than with normal elastomers (185/190°C).

Considering Lenpur's tendency to yellow when undergoing heat setting treatments, the use of this elastomer reduces this phenomenon.

Machining processes carried out

Knitting

The following fabric samples were carried out:

- Sample A jersey 92% Lenpur 8% Lycra elastomer knit on all rows;
- Sample B jersey 95% Lenpur 5% Lycra elastomer knit on alternative rows.

Sample A was produced on a machine with a diameter of 30" E28 102 rows.

Sample B was produced on a machine with a diameter of 30" E28 90 rows.

Special finish

The samples were treated in one single machining cycle.

- Tubular fabric opening
- Heat setting
 - Dry fabric insertion
 - Steaming preparatory to the drafting zone
 - Heat setting in a 5-chamber, methane-gas powered stenter
 - Temperature of chambers 170°C
 - Entry width 165 cm
 - Height of the drafting zone 170 cm
 - Exit width of fabric 180 cm
 - Speed m/min
- Scouring
- Bleaching with hydrogen peroxide + optical bleacher
- Squeezing-opening
- Passage to open dryer + relax
- Final ironing
 - Dry fabric insertion
 - Steaming preparatory to the drafting zone
 - Levelling in the 5-chamber, methane-gas powered stenter
 - Temperature of chambers 140°C
 - Height of the drafting zone 170 cm
 - Exit width of fabric 160 cm
 - Speed 15m/min
 - Winding and packing

Remarks

Level of whiteness

The samples were treated with a scouring and bleaching recipe to obtain a standard level of whiteness for cotton fabrics.

No change was made to the bleaching recipe initially to avoid the influence of variables in the subsequent phase to perfect the product.

One section of the sample fabric called A (enclosed) was subjected to a scouring and bleaching treatment using the laboratory dyeing machine.

The fabric has a better level of whiteness after this treatment.

Heat setting

The sample called B (enclosed) obtained by knitting alternate rows of the elastomer does not present any problems as a result of the reduced heat setting temperature.

Sample A has an excessive tendency to roll up after being cut: this phenomenon is the result of the high heat setting temperature adopted.

The elastomer is heat set, since at the points where the loops come into contact with each other we find the typical "fusion" that creates a mesh of loops that are unlikely to run.

The following considerations are the result of heat setting at 170°C:

- By using Lycra D 09 M it is possible to operate at much lower temperatures than when using the elastomers currently on the market, reducing the yellowing phenomenon of the Lenpur fibre.
- The temperature reached with the methane gas powered stenter subjects the fabric to an actual temperature that is 3-4° lower than the one indicated by the sensors; ideally, heat setting should be carried out with a diathermic oil powered stenter, that would make it possible to control the temperatures better.
- To reduce the risk of yellowing of the Lenpur fibre, a production cycle would be ideal that starts with thermal fixing and then proceeds with the scouring, bleaching and ironing operations.
- The rolling-up tendency can easily be resolved with a heat setting test at 175°C, that would not influence the level of whiteness of the Lenpur fibre.

We think it is important to carry out an industrial test with a fabric with the same characteristics as sample A, selecting the knitting machine, setting LFA values (Length of thread absorbed) of the threads, weight per square metre (weight/m²), the width of the untreated fabric, dimensional stability and elasticity and extensibility according to the type of product required.