

1/2MM OF YARN TO A FABRIC
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Abstract

Using the EIB for evaluating yarn appearance and CYROS for evaluating these yarns in a woven or knitted fabric transforms yarn diameter measurements into a simulated fabric. This combined system provides yarn quality information and fabric simulations that previously were very costly to perform. Additionally, this system allows for simulations of fabrics with or without particular yarn faults that are in the yarn.

Introduction

At the National Cotton Council Conference in 1995 here in San Antonio, C.K. Bragg and J.D. Wessinger presented "INSTRUMENT MEASUREMENTS OF YARN APPEARANCE". Their report evaluated the EIB to grade cotton yarn appearance objectively and correlates the results with subjective measurements using ASTM Appearance Grade Standards.

Discussion

In the report introduction, they refer to frequently encountering situations where weight evenness measurements (capacitance measuring devices) give one indication of quality differences, and subjective, or visual, evaluation of yarn appearance gives different results. In cases where variations in bulkiness of yarn do not coincide with variations in mass, visual perception of yarn evenness is somewhat different from instrument measurements of weight variations.

Their conclusions were:

- Using single yarns, image analysis systems can be used to grade yarns objectively and effectively in a fashion similar to ASTM Standards.
- The qualitative and quantitative information from yarn images appears to be extremely useful in further defining yarn quality.
- Image analysis appears to provide a method by which yarns with periodic variations can be channeled to insensitive products where the visual perception of the variations is minimized.

Since that conference, the EIB has been used for evaluation of yarn appearance and yarn grading. Many examinations of

yarn appearance with the EIB and that of capacitance and taper board grading have been compared. All comparisons have concluded that the EIB is excellent for grading cotton yarns for appearance, yarn faults and yarn grading.

Recently the data from the EIB has been delivered to CYROS for fabric appearance under all types of woven and knitted simulations. Using this simulation has provided yarn spinners, weavers and fabric finishers with information that previously required the actual manufacture of fabrics for evaluation. The savings of time, money and materials have been significant for the users.

Simulations of yarn and fabric with 'what if' simulations have given the user an advantage over the competition in that there is no other way to perform a change in yarn or fabric structure unless actually changing a production machine for the new simulation.

Results

Using the EIB/CYROS simulator provides the following advantages:

- Offers Precision
- Saves Time
- Saves Money
- Offers Versatility.

Precision is using an optical camera that measures the diameter of a yarn every 1/2 mm. The diameters are stored in a file within a computer. Reports are presented that simulate what the human eye detects.

Saving time because this system uses efficient methods to evaluate a yarn's appearance in a fabric. The testing time is as low as 1 minute. Fabric simulations show these diameter measurements in a chosen color and woven or knitted configuration.

How much does it cost to make yarn samples, test yarn samples for evenness, hairiness, taper board, twist and count, make a warp, set up a weaving machine, make a fabric, inspect the fabric and dye the fabric? All of these costs are eliminated with the use of the EIB/CYROS simulator.

The EIB/CYROS system offers the versatility to make changes in the yarn construction, fabric construction, and color at the computer simulator. There is the flexibility to change yarn count, yarn-clearing settings, picks per inch, warp ends, woven pattern and fabric color.

Summary

The global competition for textile fabrics has required many private companies to reduce costs in all areas. This is especially true in the United States. Research and Development has suffered the loss of manpower and operating funds.

Using the EIB/CYROS requires less labor, less use of production machines, and less use of raw materials. The EIB/CYROS combination allows for quicker results and faster changes by using a smoothing factor to take out or add desires of the user in the simulated results.

Since the National Cotton Council meeting in 1995, the EIB has expanded its capability according to the requests of the industry. The addition of CYROS is a great advancement of the capabilities of predicting what a yarn will look like in a fabric using real diameter numbers.

References

Bragg, C. K., Wessinger, J. D. 1995. Instrument Measurements of Yarn Appearance. National Cotton Council Conference 1995. San Antonio, Texas.