VALIDATION OF DUAL-BEARD FIBROGRAPHY FOR COTTON LENGTH DISTRIBUTION MEASUREMENT

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Abstract

A cotton fiber length distribution and uniformity measurement system was developed based on dual-beard fibrography generated by transmitting scan of a sliver sample that is randomly clamped and combed to form two tapered ends. The new measurement approach can avoid fiber alignment needed for a single beard sample and allow the beard to be completely scanned to include short fiber content for compehensive length measurements including length distributions, uniformity and other major parameters. In this presentation, we will briefly introduce a fibrography approximation algorithm with a new optimization method that improves both accuracy and efficiency of the fiber length contents, and then elaborate the performance tests (1) with multiple scans of a dual-beard sample with different scanning positions and orientations, (2) with different scanning brightness levels, (3) with different weights of dual-beard samples, and (4) with slanting angles at which a sample is placed on the scanner. These tests revealed that a single scan is sufficient to generate a fibrography comparable to the multiple scans of the same sample. The scanning brightness has a significant impact on the shape of a fibrography as do the sample thickness and the combing conditions. The system uses a pre-scan to analyze its brightness range of the sample and then adjusts the scanning brightness for the final scan. The image of a slanted sample can be rotated to a preset direction to achieve a consistent fribrography regardless of its original orientation.