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Research Article

Generation of Length Distribution, Length Diagram, Fibrogram, and Statistical Characteristics by Weight of Cotton Blends

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Abstract

The textile fibre mixture as a multicomponent blend of variable fibres imposes regarding the proper method to predict the characteristics of the final blend. The length diagram and the fibrogram of cotton are generated. Then the length distribution, the length diagram, and the fibrogram of a blend of different categories of cotton are determined. The length distributions by weight of five different categories of cotton (Egyptian, USA (Pima), Brazilian, USA (Upland), and Uzbekistani) are measured by AFIS. From these distributions, the length distribution, the length diagram, and the fibrogram by weight of four binary blends are expressed. The length parameters of these cotton blends are calculated and their variations are plotted against the mass fraction x of one component in the blend. These calculated parameters are compared to those of real blends. Finally, the selection of the optimal blends using the linear programming method, based on the hypothesis that the cotton blend parameters vary linearly in function of the components ratios, is proved insufficient.