World Academy of Science, Engineering and Technology
International Journal of Materials and Textile Engineering
Vol:9, No:10, 2015

Recycling of Post-Industrial Cotton Wastes: Quality and Rotor Spinning of Reclaimed Fibers

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Abstract : Mechanical recycling of post-industrial cotton yarn wastes, as well as the effects of passage number on the properties of reclaimed fibers, have been investigated. A new Modified Fiber Quality Index (MFQI) and Spinning Consistency Index (MSCI) for the characterization of the quality are presented. This index gives the real potential of spinnability according to its physical properties. The best quality of reclaimed fibers (after 7th passage) was used to produce rotor yarns. 100% recycling cotton yarns were produced in open-end spinning system with different rotor speed (i.e. 65000, 70000, and 80000 rpm), opening roller speed (i.e. 7700, 8200, and 8700 rpm) and twist factor (i.e. 137, 165, and 183). The effects of spinning parameters were investigated to evaluate a 100% recycling cotton yarns quality (TQI, hairiness, thin places, and thick places) using DOE method.

Keywords : cotton wastes, DOE, mechanical recycling, rotor spinning
Conference Title : ICTE 2015 : International Conference on Textile Engineering
Conference Location : Istanbul, Türkiye
Conference Dates : October 26-27, 2015