Conclusions

This study concerns the effect of opening roller type, fibre type, yarn linear density, and opening roller speed on the twist efficiency of 100% polyester rotor spun yarns. The conclusions listed below can be stated as a result of this work.

The twist aspect of rotor spun yarns is quite complicated and has several parameters influencing the twist insertion rate into the rotor yarn body.

Results of variance analysis affirmed that fibre type and opening roller type are significantly influential parameters for the twist insertion efficiency of 100% polyester rotor spun yarns.

The twist insertion efficiency of rotor yarns is affected by fibre linear density. Finer polyester fibre types exhibit lower twist insertion efficiency than thicker fibre types. Increasing the fibre stiffness of thicker fibres helps to decrease the formation of wrapper fibres, which may result in higher twist insertion into the rotor yarn. This statement is affirmed for all four fibre types of 30 tex yarns, as well as P3 and P4 fibre types of 50tex.

Fibre spun length is another aspect affecting the twist insertion efficiency of rotor yarn. Longer fibres have a higher tendency to form wrapper fibres around the rotor yarns, resulting in lower twist insertion efficiency. Longer - and low density - polyester fibre type P3 has the lowest twist insertion efficiency.

The evaluation of change in the opening roller speed for the twist insertion ratio reaffirmed the statements of Tyagi and Ülkü, 1993. Increased opening roller speed raises fibre separation efficiency, and maintains better twist insertion rate.

It has been reported that increased yarn linear density decreases the twist efficiency of yarn. [1, 9] In this work it was observed that an increase in yarn linear density improves twist insertion efficiency contrary to Dyson’s statement. In order to clarify this unexpected finding, more experimental study should be carried out to understand the relation between yarn linear densities and twist insertion efficiency.

Editorial note

The names of companies or commercial products are mentioned solely for the purpose of providing specific information; their mention does not imply recommendation or endorsement over others not mentioned.

References

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