

Effect of Multiple Open-End Processing Variables Upon Yarn Quality

The present study on the effect of multiple open-end processing variables upon the yarn quality was initiated in Department of Fibre Technology and carried out at Shafi Spinning Mills Sheikhupura Road Faisalabad. The representative lint cotton samples of the cotton variety MNH-93 were collected from the running stock for its evaluation.

These physical characteristics were estimated by high Volume Instruments (HVI)-900 SA), a fibre testing system manufactured M/s Zellweger Ltd., Switzerland. Specimen lint samples recorded span length with its mean value of 1.03 inch and CV as 0.85%, fibre uniformity ratio with its mean value 48.13% and CV as 1.35%, fibre micronaire with its mean value 4 with CV as 2.74%, fibre maturity percentage with its mean value 82.12 % and with CV as 0.76%, fibre bundle strength with its mean value 84.15000 lb/in² with CV as 0.53%, fibre elongation percentage with its mean value 7.3% and CV as 2.88%, cotton colour with its mean value of 67.92 and CV as .72%, trash percentage with its mean value 1.04% and CV as 10.31% and trash count with its mean value 8.2% and CV as 5.21 %. These physical characteristics were estimated by high Volume Instruments (HVI)-900 SA), a fibre testing system manufactured M/s Zellweger Ltd., Switzerland.

Raw cotton was processed at the blow room, carding and drawing section. The drawing sliver of 0.12 hanks was fed to the open-end machine (Model SE 8, Schalafhorst, Germany). Following are the coding of the variables of the open-end machine for the current study:

1. Rotor Diameter

D1 = 33 mm, D2 = 40 mm.

2. Draw-off Navel Type

N1 = Spiral grooved path with built-in four notches. (KN4R4)

N2 = Built-in four coarsely grooved notches. (KN4)

N3 = Built-in finely grooved spiral path. (Spiral)

3. Yarn count

C1 = 10s, C2 = 16s, C3 = 20s

The yarn samples thus fabricated were evaluated for the following parameters. Evenness and hairiness. Yarn evenness (U%) is determined by measuring the variation in capacity occurring as yarn passes through the condenser and recorded in terms of mean linear irregularity (U%) and the coefficient of variation in yarn mass (CV%). The hairiness module of the UT-3 consist of an electronic optical sensor which converts the scattered light reflection of the peripheral fibres into a corresponding electrons signal while the solid yarn body is eclipsed.

Yarn hairiness is expressed in the form of hairiness value H, which is an indirect measure for the number of cumulative length of all fibres protruding from the yarn surface. The procedure of testing was derived from ASTM Standards (1997). Analysis of data. The data were analysed statistically using three-factor factorial completely randomized design (CRD)