Production of shape memory alloy core-sheath friction yarns

ABSTRACT

This paper describes some studies on the development of shape memory alloy (SMA) core-sheath friction yarns. SMA wires for actuating purposes were utilised as a conductive element in the core-sheath friction yarn. A DREF 3000 friction spinning machine was used to produce the yarns. The conductive yarn was spun with the SMA actuator wire at the core and 100% cotton fibers in the second layer as the sheath producing a yarn called SMA core-sheath friction yarn (SMA CSFY). During spinning, the core-sheath ratio and spinning drum speeds were varied. The main purposes of the study were to evaluate the SMA CSFY single yarn tensile strength and its actuating performance against changes in the spinning process parameters. The results showed that SMA CSFY with the highest spinning drum speed and 60% core gave the highest tensile strength and fastest actuation performance.

Keyword: Shape memory alloy; DREF 3000 spinning system; Conductive yarn