Influence of Varying Supply Yarn Package Diameter on the Pirn Winding Tension

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Abstract

Pirn winding is an operation of winding yarn from supply yarn package onto pirns which are used for shuttle weft insertion. As the package size varies when winding pirns, the varying balloon effect caused to change the thread tension at the winding point of the pirn. As a number of pirns can be wound from a single supply yarn package, pirns are wound from different yarn package diameters. A significant change in take off tension takes place from pirn to pirn. Placing dead weights on the disc tension controller which adds a tension to take off tension may help to compensate the yarn tension variation to some extent. However, incorrect timing of compensation and stepwise compensation may create significant tension variations in pirn windings. The authors attempted to design a tension control device by applying an automatically continuously varying electromagnetic force on the dead weight, so that the variation of take off tension due to change of package diameter is compensated and investigate influence of varying supply yarn package diameter on the final winding tension of pirn.