



CURRENT AND FUTURE TRENDS IN YARN PRODUCTION¹

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ABSTRACT

While developments in yarn manufacturing continue to be promoted by machinery makers, spinners are challenged to produce the best quality yarn at an acceptable price. This often results in a compromise, since improved yarn quality can usually only be achieved at a higher processing cost (including raw material selection). An additional difficulty is that the significance of the various attributes of quality change for different yarn's end uses. While the solution to lowering yarn costs, that has been adopted in recent years has been to create large, almost fully automated spinning mills, this philosophy is presently being questioned, since this significantly reduces flexibility with respect to the fiber and yarn type that can be processed. This is obviously at odds with the current paradigm of customer driven, quick response manufacturing, since this demands inherent flexibility in the successful supplier. This paper reviews the current state of technological innovation in yarn production and examines the relative merits and disadvantages of each system. Some insight will also be given concerning those factors that limit further development of some of these systems. Historical trends in US yarn production have also been surveyed, and the combined information obtained is used as an indicator of the future directions in this key industry.

KEYWORDS: Yarn Production, Spinning, Vortex Spinning, Centrifugal Spinning

1. INTRODUCTION

Research into new technology for yarn formation peaked in the 60's & 70's. Since that time some systems have gained significant commercial acceptance, whereas other proposed systems have met with little (or zero) success. When viewed in terms of their potential for spinning a range of fiber types (as show in Figure 1), it is apparent that real success is only evident for rotor (open end) spinning and ring spinning. While other systems have promised significant benefits, these have met with limited success due to

shortcomings in certain aspects of yarn and fabric quality (Figure 2). This aspect cannot be over stressed since while ring spun yarns may not be the best when considered from certain quality aspects, but they do provide an overall balance of quality aspects, which still make them the yarns of choice for most applications. Thus caution should be exercised when assessing a new system since good strength and regularity are meaningless if the fabric has a harsh handle or if the system is restricted in fiber type that can be successfully spun, etc.

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