

Handbook of Yarn Production: Technology, Science and Economics

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QUALITY OF NEW KIND OF YARNS VERSUS RING SPUN YARNS – COMPARATIVE STUDY

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ABSTRACT

Ring spun yarn is still considered by most of producers as yarn with ideal structure and parameters. This preference is confirmed by end-textile-product manufactures because of overall balance of quality aspects, which still make them the yarns of choice for most applications. Development in yarn manufacturing is continuing and it is a challenge for most of scientific teams. The new spinning system was developed and its potential can be interesting from the point of view of yarn quality and also economical cost. Main aim of this article is to show a part of results of verification tests, which was realized on cotton samples. The influence of spindle speed on selected yarn characteristics is discussed and statistically verified. The outputs of experiments indicate that the quality of the "New yarns" is comparable with conventionally produced ring yarn with lower economical cost.

KEYWORDS: ANOVA, New Spinning System, Spindle Speed, Quality of Yarn

INTRODUCTION

Yarns produced by classical ring spinning technology still constitute an important part of world production. Principle of ring spinning technology has been developed in the 19th century. Since that time, the principle of ring spinning system is not changed, only technologically and technically improved as remarked e.g. Klein W. (1987) and Lord P. L. (2003). The classical conventional ring spinning technology allows processing of a wide range of fiber materials and ring spun yarns are suitable for a wide segment of products. Due to strong competition in the market starting in 80s of 20th century, it was necessary to reduce the economic costs of yarns production. A number of scientific institutions upgraded conventional spinning system or developed new unconventional methods of yarns production such as rotor, friction, air jet or other spinning systems. Conventional and unconventional spinning systems are generally described e.g. by Chaudhuri A. (2003), Klein W. (1987) and Lord P. L. (2003). There were published numerous design solutions and patents, but only some of them were put into practice. On the other hand the unconventional technologies enabled an increase in yarn production, but always with some restrictions (limited range of processed fibers, different quality of yarn suitable only for a narrower segment of products, etc.). Current and future trends in yarn production, spinning capacity and economic aspects for various technologies discussed Oxenham (2002).

A challenge of scientific team solved the project Textile Research Centre II was to find a way of yarn production which would enable spinning of yarn qualitatively similar with ring yarn at lower economic costs. The new solution is based on a similar principle without traveler. The new system is carried out on an operating unit which comprises a driven spindle and a balloon control ring which is concentric with the spindle, is driven in the same sense as the latter and has an inner operating surface. In order to achieve a high operating speed, the centrifuging process always first imparts the shape of a rotating open loop to the yarn which is entrained by the operating surface and runs in the direction towards the tube on the spindle. The yarn is then drawn off from the open loop and wound directly onto the tube. At the same time, this rotating

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