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Three-Dimensionally Knit Spacer Fabrics: A Review of Production Techniques and Applications

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ABSTRACT

As the textile complex is faced with increasing competition, innovation and specialization have been employed by many machinery and product manufacturers to create a niche in the marketplace. In an effort to compete and appeal to the end-use market, products that go beyond the current range of performance and style have been developed. This paper will focus on the development of such specialized production through the use of knitted spacer fabrics. Basic knitting concepts will first be introduced followed by a review of literature on the history, technologies, advantages, disadvantages and potential end uses of knitted spacer fabrics.

Keywords: Spacer fabrics, knitting, automotive textiles, technical textiles

1.0 INTRODUCTION

As control of the textile complex has shifted further downstream to the consumer, manufacturers have been faced with greater and more specialized demands. In order to compete and appeal to the end-use market, it is therefore important to offer products that go above and beyond the current range of performance and style offerings. One industry striving to meet such demands is the manufacturers of knitting machinery and knitted fabrics.

This paper will first introduce some necessary knitting concepts and then discuss the topic of spacer fabrics. Literature on the history, technologies, advantages, disadvantages and potential end uses of knitted spacer fabrics will then be presented to create a complete understanding of spacer fabric's purpose and means of production.

2.0 KNITTING FUNDAMENTALS

Simply stated, knitting is the interlooping of yarns to form a textile structure. There are two classifications of knits – weft and warp. Weft formations have yarns which are knit across the width of the fabric while warp formations have yarns being knitted along the length of the fabric (Spencer, 2001) (see Figures 2.0a and 2.0b).