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Study on the Prediction of Serviceability of Garments Based on the Seam Efficiency and Selection of the Right Seam to Ensure Better Serviceability of Garments

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Abstract : Seam is the line of joining two separate fabric layers for functional or aesthetic purposes. Different kinds of seams are used for assembling the different areas or parts of the garment to increase serviceability. To empirically support the importance of seam efficiency on serviceability of garments, this study is focused on choosing the right type of seams for particular sewing parts of the garments based on the seam efficiency to ensure better serviceability. Seam efficiency is the ratio of seam strength and fabric strength. Single jersey knitted finished fabrics of four different GSMs (gram per square meter) were used to make the test garments T-shirt. Three distinct types of the seam: superimposed, lapped and flat seam was applied to the side seams of T-shirt and sewn by lockstitch (stitch class- 301) in a flat-bed plain sewing machine (maximum sewing speed: 5000 rpm) to make (3x4) 12 T-shirts. For experimental purposes, needle thread count (50/3 Ne), bobbin thread count (50/2 Ne) and the stitch density (stitch per inch: 8-9), Needle size (16 in singer system), stitch length (31 cm), and seam allowance (2.5cm) were kept same for all specimens. The grab test (ASTM D5034-08) was done in the Universal tensile tester to measure the seam strength and fabric strength. The produced T-shirts were given to 12 soccer players who wore the shirts for 20 soccer matches (each match of 90 minutes duration). Serviceability of the shirt were measured by visual inspection of a 5 points scale based on the seam conditions. The study found that T-shirts produced with lapped seam show better serviceability and T-shirts made of flat seams perform the lowest score in serviceability score. From the calculated seam efficiency (seam strength/ fabric strength), it was obvious that the performance (in terms of strength) of the lapped and bound seam is higher than that of the superimposed seam and the performance of superimposed seam is far better than that of the flat seam. So it can be predicted that to get a garment of high serviceability, lapped seams could be used instead of superimposed or other types of the seam. In addition, less stressed garments can be assembled by others seems like superimposed seams or flat seams.

Keywords : seam, seam efficiency, serviceability, T-shirt
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