

Development of Chafe Resistance Apparel

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Abstract:

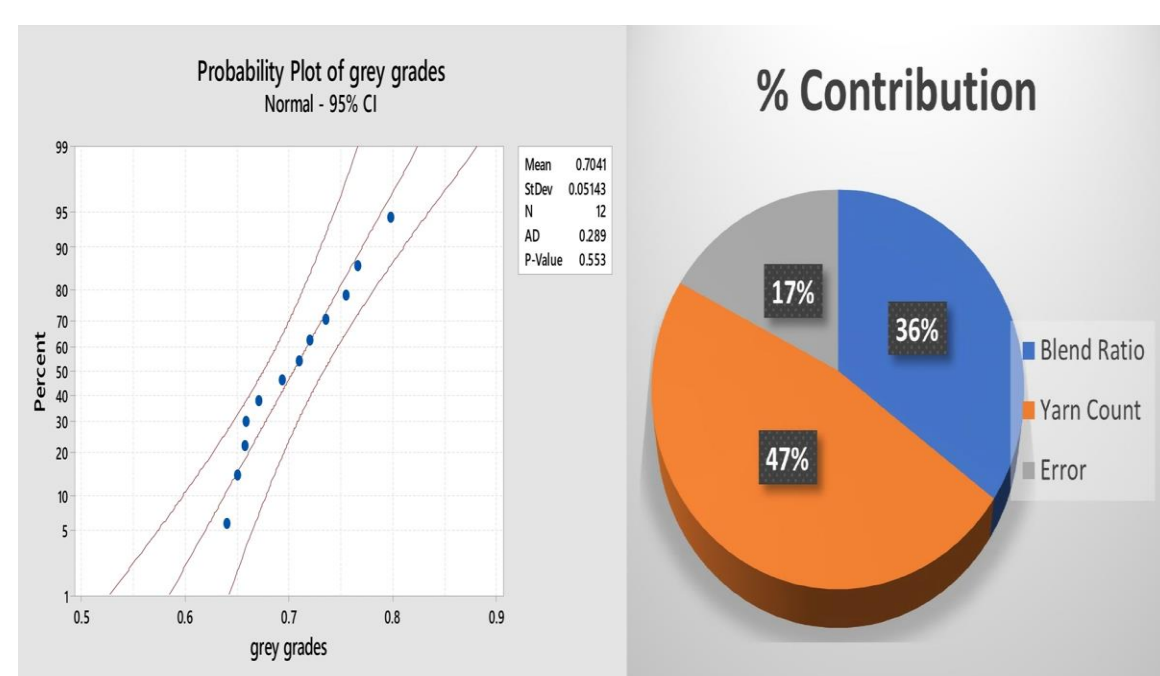
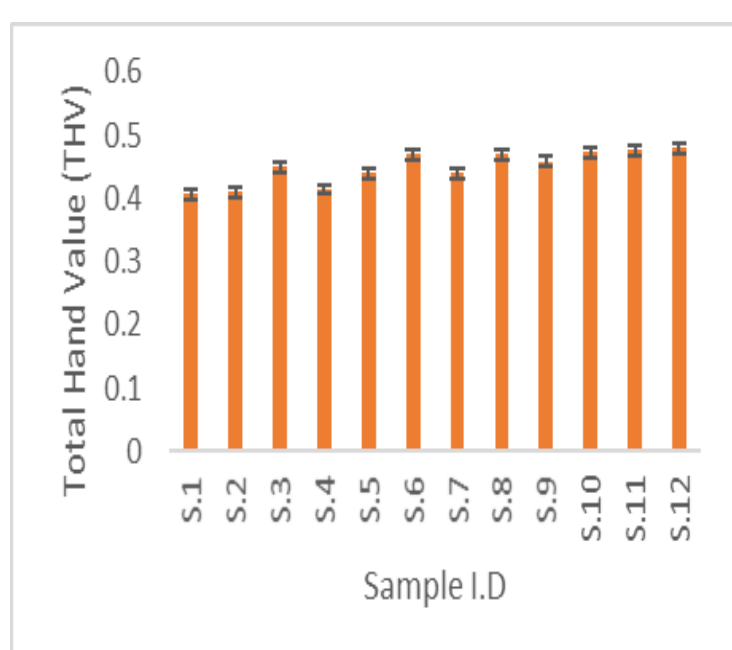
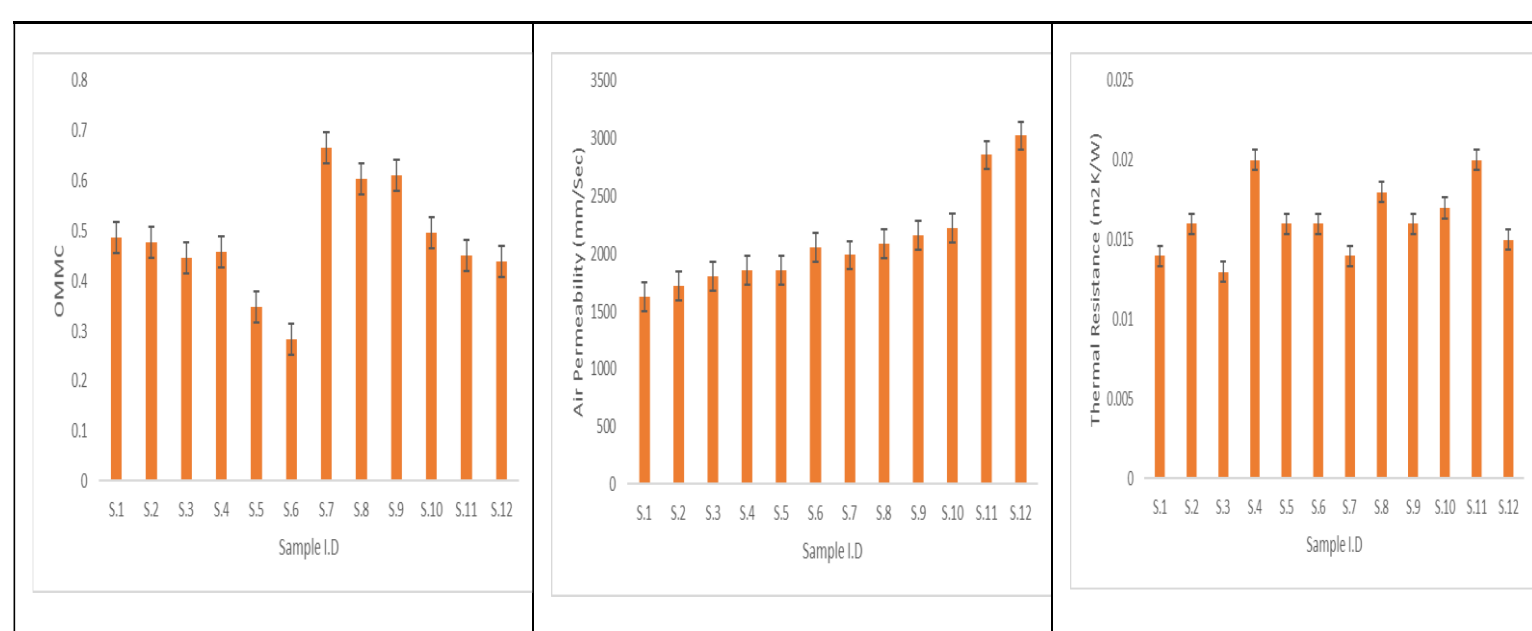
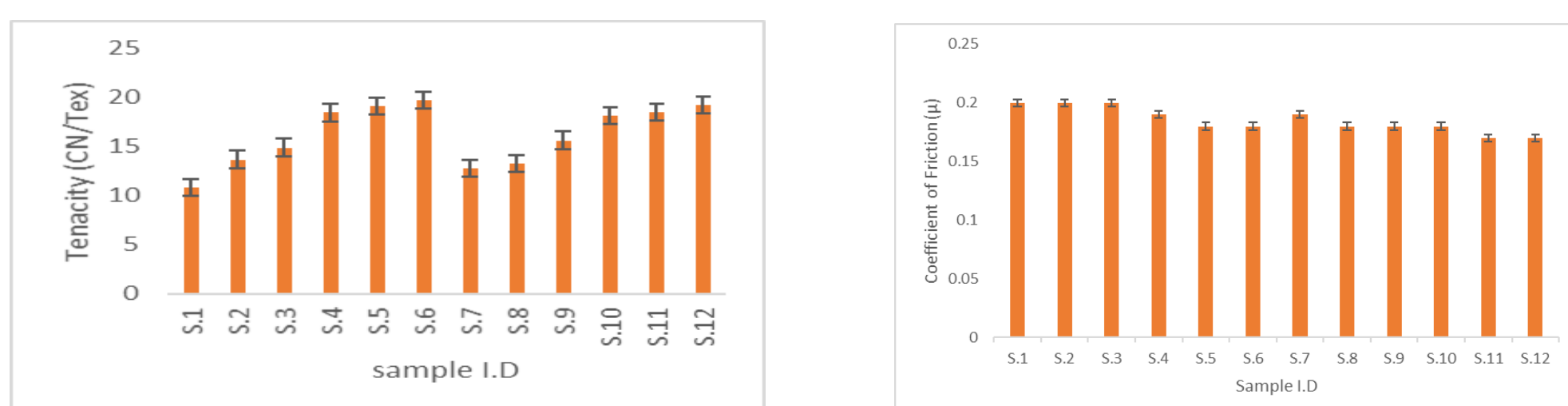
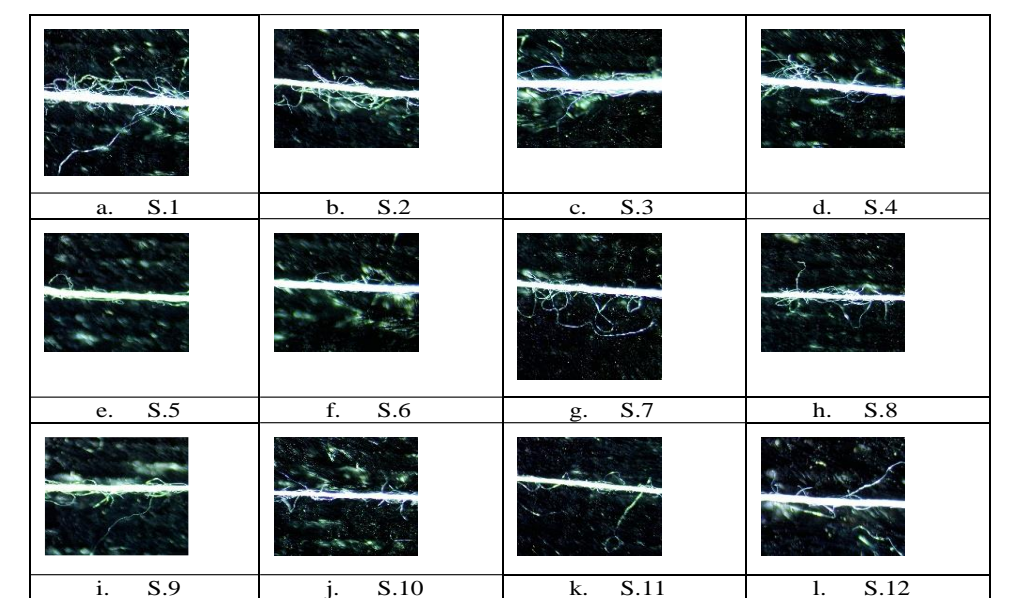
Clothing comfort is the first and foremost property of the fabric considered by consumers, especially in apparel. As the under-wear fabrics come in direct contact with the skin so it demands better chafe resistance properties. Better comfort and frictional properties in the under-wear fabrics are one of important requirements. The objective of this study is to investigate the effect of the different blends (%) of cotton, Coolmax, and micro polyester fibers and two linear densities i.e., 24/1s and 30/1s (Ne/English count) on the friction and comfort properties of the knitted underwear. It is concluded that a combination of natural and synthetic fibers with finer linear density results in better-performing fabrics with regard to friction and moisture management. Sample containing 50% cotton and 50% micro-polyester with 30/1s yarn count was declared as the best samples based on the Grey Relational Analysis which is a multi-response optimization technique.

Materials & Methods:

- 12 yarns were prepared having different blend % and linear density as shown in Table 1
- Yarn testing and fabric testing both were done.
- Grey relational analysis is the statistical technique used for the optimization of experimental parameters. Grey Analysis is very effective tool for the decision making and analyzing the data then sort out the best.



Sample Id	Blend Percentage (%)			Linear density(Ne)
	Cotton	Coolmax	Polyester	
S.1	50	50	0	24/1
S.2	50	40	10	24/1
S.3	50	30	20	24/1
S.4	50	20	30	24/1
S.5	50	10	40	24/1
S.6	50	0	50	24/1
S.7	50	50	0	30/1
S.8	50	40	10	30/1
S.9	50	30	20	30/1
S.10	50	20	30	30/1
S.11	50	10	40	30/1
S.12	50	0	50	30/1



Results:

- In this study, it is concluded that yarn linear density and percentage of the fiber content in the blend both are the vital factors affecting the thermo-physiological comfort and tactile properties of the knitted underwear.
- Yarn Liner density plays a major role in the performance properties.
- According to the Grey analysis ranking, sample composed of 50% cotton and 50% micro polyester with 30/1 Ne ranked as the topmost (1st.). This sample has higher air permeability, lower thermal resistance, moderate moisture management and better sensation properties which are suitable for under wear fabrics.
- It was manifested that finer yarn have better thermo-physiological characteristics as well as higher smoothness and lower friction properties.
- The finding of this study can be helpful for manufacturers to develop fabric with better friction resistance and comfort properties .

Reference :

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