

Examining the Impact of Stitch Density, Thread Size, and Direction on the Seam Strength of Cow Upper Leather

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Abstract:

Leather is a flexible, long-lasting material composed of interwoven collagen fibers that are used to make footwear, apparel, and other leather goods. This study examines the impacts of the direction of leather, stitch density, and thread size on the seam strength of cow-upper leather. The Taguchi design of experiment and ANOVA methods have been employed to evaluate and examine the seam strength of cow upper leather. The study employed control variables ranging from 6 to 12 SPI for stitch density, 60/2, 40/2, and 40/3 thread sizes, and parallel, perpendicular, and diagonal leather direction. The strongest seams are produced with stitch densities of 12 SPI, thread sizes of 40/3, and parallel orientations. According to the results of the study, the seam strength of cow upper leather was significantly impacted by the stitch density or the number of stitches per inch. Based on the Taguchi design of the experiment and the ANOVA result of cow upper leather the stitch density increases and the seam strength also increases. From the graph of the S/N ratio, the slope is higher in higher significant stitch density. As the stitch density increases the seam performance also increases (when the stitch density is 6 SPI, S/N ratio 54.67 N, and when the stitch density is 12 SPI, S/N ratio 59.15 N). Based on these findings, several recommendations are presented. These include determining the optimal stitch density range, selecting appropriate thread sizes, considering stitching direction, implementing quality control measures, fostering collaboration, and encouraging further research

Keywords:

Leather; Seam Strength, Thread; Stitch

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