

COMPARATIVE ANALYSIS OF SEAMS TAPPED WITH PU AND GORE-SEAM® TAPE IN MEMBRANED FABRICS

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This study presents a comparative analysis of seam sealing in laminated fabrics using polyurethane (PU) tape and Gore-Seam® tape. The research aims to evaluate the performance of both sealing methods in terms of two key parameters - **water resistance** and **mechanical strength** of the seams, assessed before and after 30 washing cycles to simulate real usage conditions.

Traditional sewing with needle and thread remains a fundamental joining technique in the textile industry; however, it introduces needle holes that compromise the integrity and barrier properties of high-performance fabrics. This limitation is particularly critical in protective, medical, or military clothing, where leakage or reduced durability can pose safety risks.

Modern alternatives such as welding (by hot air, ultrasonic, or laser methods) and adhesive bonding with sealing tapes offer effective solutions for maintaining waterproofness and functional integrity. The results of the conducted tests demonstrate that both PU and Gore-Seam® tapes significantly improve the waterproof performance compared to conventional seams. Nevertheless, Gore-Seam® tape exhibits superior long-term water resistance and durability after multiple washing cycles, while PU tape provides higher elasticity and cost efficiency.

The findings highlight the importance of selecting the appropriate seam sealing technology depending on the intended use and required performance of the textile product, contributing to the optimization and innovation of functional apparel production.

Keywords: seam sealing, PU tape, Gore-Seam®, laminated fabrics, waterproofness, mechanical strength, functional textiles.

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