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## Thermal and humid influence on the interfacial aging of polyurethane coated polyketone fabrics

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This study analyzed the effect of heat and moisture on the polyketone-polyurethane coating system and proposed a predictable relationship based on the analysis. Polyketone is an environmentally friendly material because it uses carbon monoxide as a raw material and is inexpensive to produce. Also, it has excellent heat resistance, impact resistance, and chemical resistance, and thus is highly applicable to industrial fabrics such as waterproof fabric. On the other hand, polyurethane is a coating material excellent in abrasion resistance, weather resistance and oil resistance in addition to waterproofness. The waterproof properties of the waterproof fabric depend on the occurrence of defects on the coated surface and the adhesion strength between the coating and the fabric. The interfacial adhesion strength that can overcome external forces is determined by the bonding method and bonding force of the lamination system, which affects the life of the waterproof fabric.

In order to improve the durability of the waterproof fabric, polyketone fabric was used instead of the polyester or nylon fabric used in the past, and polyurethane generally used for waterproof coating was used. Environmental impacts, including temperature and humidity, affect the polyketone-polyurethane coating system from the fabric surface. Therefore, the surface properties were observed using SEM, and the hydrostatic head test of the fabric was used to determine the level of defect on the coated surface. Tensile and adhesion strength were tested to determine the mechanical properties of the coated fabric. The chemical changes after aging were qualitatively analyzed using FTIR, and the chemical changes of the polymer network by decomposition were measured from the results of weight reduction. The degree of damage due to the degradation of the coated surface was confirmed by weight loss value according to temperature, humidity and exposure time. The adhesion characteristics of polyketone - polyurethane coating system according to exposure environment were evaluated from the peeling strength results. Also, the behavior of adhesive force could be predicted.

In conclusion, we found that temperature, moisture, and exposure time affect the interfacial adhesion of polyketone-polyurethane coating systems, and the interrelationships were partially confirmed by analyzing the results.

### Biography

Jee-Woo Yang has her expertise in fiber reinforced composites. She is working on improving the bonding performance of reinforcing materials and matrix of fiber reinforced composites. The results of the research on the thermal insulation properties of composite materials have been presented and the analysis model of aerogels also has been presented by her.

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