# 자연 나노헤어 구조물의 부착 기능에 대한 개관

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# Survey on the adhesive function of nano-hair structure in nature

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**Key Words:** attachment(부착), nano structure(나노구조물)

**Abstract :** In nature, some creatures have the ability to walk vertically or upside down on various natural surfaces. The mechanism of adhesion can be capillarity, viscosity of adhesive secretion, interlocking or intermolecular force and so on. In this paper, we focus on the intermolecular force generated by nano-size hair-like structures of creatures and natural surfaces and we introduce briefly the mechanism of adhesion with intermolecular force and other mechanism of adhesion. And we enumerate the creatures which have various size of nano-hair structures and the manufactured nano-hair structures which mimic the nature.



# 불규칙 섬유배열을 가진 일방향 복합재료의 미시역학적 해석

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# Micromechanics of a Uni-directional Composite with Randomly Distributed Fibers

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**Key Words:** Interfacial strains(경계면 변형률), Micromechanics(미시역학), Representative Volume Element(RVE, 대표체적요소), Random Fiber Array(랜덤배열)

**Abstract :** The micromechanical approach was used to investigate the interfacial strain distributions of a unidirectional composite under transverse loading in which fibers were usually found to be randomly packed. Representative volume elements (RVE) for the analysis were composed of both regular fiber arrays such as a square array and a hexagonal array, and a random fiber array. The Fourier series approximation with proper coefficients was utilized to evaluate the strain distributions at the interface for the regular and random fiber arrays with respect to fiber volume fractions. From the analysis, it was found that the random arrangement of fibers had a significant influence on the strain distribution at the interface, and the strain distribution in the regular fiber arrays was one of special cases of that in the random fiber array.