

**Topic of the Speech:**

Development of Fiber Composites for Strengthening Underwater Structure Materials

Professor Seung Kook An

Pusan National University
Korea



Professor Seung Kook An obtained his Ph.D. at the Fiber and Polymer Science Program, North Carolina State University in 1992. He got MS degree at the Department of Textile Engineering, Chemistry, and Science, North Carolina State University in 1988. He graduated at the Department of Textile Engineering, Seoul National University in 1978. After working at National Industrial Research Institute for two years, he became a professor of the department of Organic Material Science and Engineering at Pusan National University in 1995. He was appointed as director of Research Institute of Industrial Technology from 2011 to 2013, and is the director of RIS in textile material for transportation vehicle from 2011. He serves as the Korean delegate for ISO TC94/SC13 and ISO TC94/SC14. He served as a Vice President of Korean Fiber Society in 2010.

His research areas are protective clothing, physical properties of industrial textile products, comfort properties of industrial fabrics, and production technology of multifunctional flame resistant interior textile products.

-For invited speaker only

Development of Fiber Composites for Strengthening Underwater Structure Materials

Young-Mee Baek¹ and Seung-Kook An^{2*}

¹*Korean Traditional Costume Research Institute, Pusan National University, Busandaehak-ro 63-2, Busan 46241, Korea*

²*Dept. of Organic Material Sci. and Engineering, Pusan National University, Busandaehak-ro 63-2, Busan 46241, Korea*

*Presenter's email: ansk@pusan.ac.kr

ABSTRACT (NO MORE THAN 500 WORDS:)

In recent years, studies on repair and reinforcement methods for structures exposed to poor environmental conditions over a long period of time have been conducted in safety and durability issues of a structure. Various repair methods have been used for concrete structures depending on the required performance or type of damage. Most of all, fiber composite materials are attached to the surface of the structure to improve the structure's performance. Especially, for repair and reinforcement in water or wet environments, fiber composites have very strong strength, no corrosion problems, high workability, low load, high insulation, and fatigue resistance, not only enhance the damaged strength of structures that have an effect on deterioration or corrosion, but they also have a function to prevent further deterioration. In this study, we have evaluated for glass fibers, aramid fibers, and carbon fibers to develop fiber composite materials suitable for repairing underwater structure materials. The aim of this study was to develop fiber reinforced composites with improved tensile strength, tensile elastic modulus, and rate of resin impregnation. In the result of this study, unidirectional fabrics were suitable for maintenance and reinforcement, and as weft yarns, fabrics using glass fiber and silk were developed and applied. In terms of performance, strength was strong in the order of carbon fiber, aramid and glass fiber. However, when the basalt, PP, and PE were hybridized, the elongation was improved and the elastic modulus was increased. Therefore, this study has improved the strength for unidirectional weaving of each fiber and it was possible to develop various kinds of fiber composite materials.