

# Recent Research Development in Fibre Reinforced Polymer Composites for Engineering Applications

## 最新的纤维复合材料研究於工程上应用

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**Abstract:** Since the early of 50's century, carbon fibre reinforced polymer composites have always attracted much attention by the engineering industry owing to their high specific strength-to-weight ratio, ease for producing products with a complex shape by one-stop moulding process, non-corrosive properties and their embedability for placing tiny sensors and actuators to make them multifunctionable and self-defect detectable. However, in the early stage, the price of fibre was a major concern, which restricted the development of this high-strength material only in military and space applications. Until recently, technologies for mass production of these composites have become mature, which greatly lower the prices, to an acceptable limit. Therefore, many industries have started adopting them for both high-end and low-end products. For examples, the use of carbon fibre composites to strengthen civil infrastructures to prolong their service life, or to replace old structures, to make them more light and seismic resistance have been found in United States and Japan. The development of new aircraft fuselage and wings by using hybrid composites can greatly reduce their deadweight, which thus also reduce the fuel use to minimize the production of greenhouse gas from the exhaust of engines. Domestic products including sport utilities, interior components of cars and exterior structures of boats are very common to be seen in everywhere. Although the popularity of using composites has increased in recent years, many inherent problems still exist that may affect the safety level of using them for real-life applications. In this lecture, the recent trend of applications of engineered fibre composites will be reviewed and their problems are also highlighted and discussed with audiences.

**Short Biography:** Professor Lau is Pro-Vice-Chancellor (Research Performance and Development) of Swinburne University of Technology, Australia since April 2016. Prior to this appointment, he was appointed as Alex Wong/Gigi Wong Professor in Product Design Engineering and Associate Dean (Industrial Relation) in the Faculty of Engineering of the Hong Kong Polytechnic University. Professor Lau has received numerous research and teaching awards since 2002. His published articles have received citations over 18,500 times with the h-index of 65. He was appointed as World Class University Professor by the Ministry of Education, Korea. He has been elected as Academician of the European Academy of Science and Arts and Europa Academy of Sciences, Fellow of many professional organizations. He was also International Vice President of the Institution of Mechanical Engineers (IMechE) for 5 year-term (The first non-UK member is elected as Vice President in IMechE's history) and Independent Non-executive Director of King's Flair International (Holdings) Limited.