Sotirios Grammatikos

Norwegian University of Science and Technology, Norway

Solutions and breakthrough technologies to overcome the challenges of polymer composites adoption in construction

Whilst the design and manufacturing of construction composites has been improved, there are still major issues pertaining to degradation especially in challenging onshore and offshore service conditions. Coupled environmental aging with service-induced degradation lead to significant deterioration during service. Moisture, rain & sand erosion, UV radiation, lightning strikes, impact damage (from bird strikes and hail) as well as thermomechanical fatigue are the major causes of structural degradation. As the effects of the aforementioned conditions (in most cases act in combination) are not always fully understood, unexpected behavior during service often results in structural failures. This undoubtedly reduces the reliability of composites as structural elements making investors and stakeholders reticent in long-term investing in lightweight structures. A complete analysis of the drawbacks of composites that hinder them from being fully adopted by the construction sector will be presented along with the latest technological breakthroughs to overcome such obstacles pertaining to nanotechnology, modelling tools and advanced non-destructive testing.

Speaker Biography

Sotirios Grammatikos is a professor in polymers and composites at NTNU in Norway, director of the ASEM lab and leader of the research group Sustainable Composites. He is also an affiliated professor at Chalmers University of Technology in Sweden. He specializes in the area of product development, characterization, assessment and structural health monitoring of advanced composite materials and structures. His main research interests are smart features of composites, non-destructive evaluation, recycling and durability. Before joining NTNU, he worked at Chalmers, the University of Bath, UK and the University of Ioannina, Greece. He holds a PhD in materials engineering specialized in structural integrity of aerostructures (2009-2013) and has received training in lightweight aerospace composites from the Hellenic Aerospace Industry (HAI). He is author/co-author of approximately 40 publications with 10 h-index. Currently, he supervises 20 graduate and post-graduate students, part of 15 research and innovation projects of which 3 he is coordinator.

e: sotirios.grammatikos@ntnu.no

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