

Advanced and sustainable composite materials in motorsport: an industrial perspective

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Abstract

Advanced composite materials are growing their diffusion and their applications due to several important features: their lightweight, the possibility of realizing complex geometries and to overcome several technological challenges thanks to their astonishing properties in terms of stiffness and strength. High level racing championships, as Formula one or Endurance have always been the perfect scenario in which new solutions could be tested before coming to the market.

In the recent years due to the strong push given by the Co2 reduction goal and electrification advanced composite materials jumped in everyday life and started to be applied in common products, from sport goods, to mass transports.

This widespread diffusion opens several issues on material production and availability but in particular in ensuring sustainability and protection of human health and of the environment

The talk will give an overview of how advanced characterization techniques combined with FE simulations are being used in Dallara Automobili to understand the potentialities of advanced materials to go to a greener approach in this field.

Application of product digital twins as well as simulation aims to tackle the “grand challenge” of understanding the effects of different materials, geometry, defects and design on a Racing or automotive product first at a virtual scale. Some examples Will be presented and discussed