

Hybrid Composites: A Versatile Materials for Future

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The word “hybrid” is of Greek-Latin origin and can be found in numerous scientific fields. Hybrid composites provides superior and combined properties compared to conventional monolithic composites. The different hybrid combinations such as Two or more reinforcing phases embedded in a single continuous phase (matrix) or Single reinforcing phase embedded with two or more matrices or two or more reinforcement incorporated in multiple matrices. The problem of selecting the type of compatible fibres and the level of their properties is of prime importance when designing and producing hybrid composites.

An automotive and aerospace components inside a vehicle/aircraft made of steel, glass or carbon fibres which have been proven to be reliable in terms of performance but both industries facing challenges to develop light weight components to meet demand of regulatory body worldwide, fuel efficiency, lighter and renewable materials such as hybrid composite, is an excellent material substituting the traditional engineering material to develop a similar component. Natural fibre-based hybrid composite exhibits a significant weight reduction compared to steel/glass/carbon while being a renewable material increase the recyclability percentage of components in an automotive and aircraft. Hybrid composites are material of future for Automotive, aerospace, wind turbine, and construction industries to develop environmentally friendly and sustainable components by combing natural and synthetic materials to fulfil growing demand of composite market worldwide.

Replacing Kevlar fabric with an eco-friendly light weight material, together with an improved mechanical, ballistic and thermal properties have become an interesting research approach to achieve superior properties by hybrid composites. Research worked on application of hybrid composites in construction industry concluded that utilization of composites will continue to expand their role in construction applications only if problem such as dimensional stability, fibre-matrix interface compatibility, and flammability can improved. Virtually all the major car manufacturers in Germany, Italy, USA, etc nowadays using hybrid composites in automotive components for various applications. Composites market is multi-billion dollar business worldwide. Global market of composites is growing with volume of composite produced grew by 6.3% in India while China, Brazil, and turkey also indicated growth of composites in 2018. Europe also grew by 2.1% in 2018.



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