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Advanced composites in defence and space industries

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This review aims to summarize the available and promising applications of advanced composites structures in defence and space industries. Advanced composite materials and especially nanocomposites being multi-functional, which can have enhanced mechanical, thermal and electrical properties all at once thanks to recent research on nano additives. Multi functional materials bring added advantages other than their well known low structural weight thus they are further attractive in applications where weight and functional properties are critical. Structural health monitoring and self healing/reparing technologies involving nano composites are adapted to many parts which have long service life and damage problems under severe environments. Therefore, several sectors such as defence, aerospace, and transportation accelerated their research on advanced composite materials. This effort led to increased industrial applications which in turn gave rise to several startling side effects such as effects on occupational health and safety. Use of nano particles in industrial environments require special caution especially in case of long term exposure due to their unique properties.

In this review, the influence of nano particles such as carbon nanotubes, graphenes and nanosilica on the properties of composites, nanocomposite production methods, difficulties in integration into conventional and advanced composite production techniques will be discussed. The main focus will be on promising applications in defence and space industries will be discussed.

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