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## MANUFACTURING AND COMPRESSIVE RESPONSE OF ULTRA-LIGHTWEIGHT CFRP CORES

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### Abstract

Three-dimensional carbon fiber reinforced polymer (CFRP) cores are high performance ultra-lightweight materials that can reduce the structural mass of vehicles used in the transportation and aerospace industry, increasing capabilities and performance, and reducing fuel consumption. In this work, three different carbon fiber cores are obtained using an interlocking method from flat composite laminates with different geometries. The density of the cores is maintained less than  $48\text{kgm}^{-3}$ . Sandwich panels are manufactured using these cores and carbon fiber reinforced epoxy skins. Compressive properties of the sandwich panels are evaluated and the failure modes are studied. Experimental results are compared to those predicted by analytical modeling and finite element method analysis (FEM).

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