

## Elastic Stress Analysis of Composite Cantilever Beam Loaded Uniformly

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**Abstract :** In this investigation an elastic stress analysis is carried out a woven steel fiber reinforced thermoplastic cantilever beam loaded uniformly at the upper surface. The composite beam material consists of low density polyethylene as a thermoplastic (LDPE, f.2.12) and woven steel fibers. Granules of the polyethylene is put into the moulds and they are heated up to 160°C by using electrical resistance. Subsequently, the material is held for 5min under 2.5 MPa at this temperature. The temperature is decreased to 30°C under 15 MPa pressure in 3 min. Closed form solution is found satisfying both the governing differential equation and boundary conditions. We investigated orientation angle effect on stress distribution of composite cantilever beams. The results show that orientation angle play an important role in determining the responses of a woven steel fiber reinforced thermoplastic cantilever beams and an optimal design of these structures.

**Keywords :** cantilever beam, elastic stress analysis, orientation angle, thermoplastic

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