SHEAR AND FLEXURAL BEHAVIOR OF INNOVATIVE PULTRUDED 3-D FRP SANDWICH PANELS

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This paper presents an innovative 3-D fiber reinforced polymer, (FRP), panels designed to overcome delamination problems typically encountered in traditional sandwich panels. The sandwich panels consist of GFRP laminates and foam core. The panel consists of GFRP plates at the top and bottom connected together with through-thickness fibers to achieve the composite action. The use of the through-thickness fibers increases the out of plane properties of the panel, delays delamination-type failures, allows low cost manufacturing and ensures full utilization of the material strength. This paper summarizes the fundamental material characteristics of the sandwich panel evaluated in two phases. The first phase investigates the shear behavior of the panel tested in order to evaluate the effects of various parameters including, thickness of the panel, through thickness pattern, fiber insertions per square inch (fipsi), number of face sheet plies, in the direction and perpendicular to pultrusion of the panels. The second phase focuses on the flexural behavior of the sandwich panels in order to evaluate the effects of the same parameters.