

Effect of Fiber Orientation on the Mechanical Properties of Fabricated Plate Using Basalt Fiber

Authors : Sharmili Routray, Kishor Chandra Biswal

Abstract : The use of corrosion resistant fiber reinforced polymer (FRP) reinforcement is beneficial in structures particularly those exposed to deicing salts, and/or located in highly corrosive environment. Generally Glass, Carbon and Aramid fibers are used for the strengthening purpose of the structures. Due to the necessities of low weight and high strength materials, it is required to find out the suitable substitute with low cost. Recent developments in fiber production technology allow the strengthening of structures using Basalt fiber which is made from basalt rock. Basalt fiber has good range of thermal performance, high tensile strength, resistance to acids, good electro-magnetic properties, inert nature, resistance to corrosion, radiation and UV light, vibration and impact loading. This investigation focuses on the effect of fibre content and fiber orientation of basalt fibre on mechanical properties of the fabricated composites. Specimen prepared with unidirectional Basalt fabric as reinforcing materials and epoxy resin as a matrix in polymer composite. In this investigation different fiber orientation are taken and the fabrication is done by hand lay-up process. The variation of the properties with the increasing number of plies of fiber in the composites is also studied. Specimens are subjected to tensile strength test and the failure of the composite is examined with the help of INSTRON universal testing Machine (SATEC) of 600 kN capacities. The average tensile strength and modulus of elasticity of BFRP plates are determined from the test Program.

Keywords : BFRP, fabrication, Fiber Reinforced Polymer (FRP), strengthening

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