

Effect of ply lay-up and curing pressure on void content in GFRP laminates of unsaturated polyester resin-reinforced woven E-glass fibers

ABSTRACT

This paper describes a laminate curing process by hand lay-up of plain-weave woven Glass fiber-reinforced polymer (GFRP) composite composed of unsaturated polyester resin reinforced with E-glass fiber fabric, EWR-600B. Symmetrical and non-symmetrical ply orientation arrangements were introduced with respect to different curing pressures to produce consistent composite panels according to the British standard code: BS 1268 (2001) for evaluations of void content and physical properties. Quantitative analysis of volume and weight fractions and void volume content were investigated according to the ASTM code: D 2734. Woven GFRP composites fabricated under different curing pressures of 351.2 (35.8 kg/m²), 687.7 (70.1 kg/m²), 1020.2 (104 kg/m²) and 1355.7 Pa (138.2 kg/m²) showed minimal significant effect on volume and weight fractions of symmetrical and non-symmetrical ply lay-up arrangement, whereas 4 % void content still fulfilled the limit of medium quality composite.

Keyword: GFRP laminate properties; Plain-weave woven fiber; Fraction volume; Curing pressure