

Internal pressure carrying capacity for different loading modes of filament-wound pipes from glass fiber-reinforced epoxy composites

ABSTRACT

Development of a low-cost filament-winding machine is initially described in this paper. The filament-winding machine was used to fabricate composite pipes and the materials used were woven glass fiber and epoxy resin. The pipes were tested under three loading modes, namely mode I (hoop pressure loading), mode II (biaxial pressure loading), and mode III (biaxial pressure with axial compressive loading). The results reveal that filament-wound composite pipes should be wound at 75° for hoop pressure loading (mode I), 55° for biaxial pressure loading (mode II), and 85° for biaxial pressure with axial compressive loading (mode III).

Keyword: Composite pipe; Filament winding; Internal pressure; Pressure carrying capacity