

The Influence of Winding Angle on Functional Failure of FRP Pipes

Authors : Roham Rafiee, Hadi Hesamsadat

Abstract : In this study, a parametric finite element modeling is developed to analyze failure modes of FRP pipes subjected to internal pressure. First-ply failure pressure and functional failure pressure was determined by a progressive damage modeling and then it is validated using experimental observations. The influence of both winding angle and fiber volume fraction is studied on the functional failure of FRP pipes and its corresponding pressure. It is observed that despite the fact that increasing fiber volume fraction will enhance the mechanical properties, it will be resulted in lower values for functional failure pressure. This shortcoming can be compensated by modifying the winding angle in angle plies of pipe wall structure.

Keywords : composite pipe, functional failure, progressive modeling, winding angle

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020