



USING BLISTER TEST TO PREDICT THE FAILURE PRESSURE IN BONDED COMPOSITE REPAIRED PIPES

S. de Barros, B. Fadhil, P. Casari, F. Jacquemin

1) Federal Center of Technological Education in Rio de Janeiro, Brazil. 2) Koya University, Erbil, Iraq. 3) Université de Nantes, Institut de Recherche en Génie Civil et Mécanique, Saint-Nazaire, France

Abstract: The composite material has entered the industry of the widest doors in all fields. Currently, it has become a strong alternative to repair systems for several reasons, including: its resistance to corrosion, rapid repair, safety as well as its distinctive economic cost. These repair systems have begun to be developed rapidly, especially in the oil industry, including the repair of pipes. Many of the researchers have carried out studies on repairing metal pipes with composite materials from. Standards ISO/PDTS 24817 and ASME PCC-2 present an equation that relates the energy release rate and the failure pressure in repaired pipes. In this work, the energy release rate is accessed by using blister tests. Glass fiber reinforced polymer (GFRP) bonded with epoxy adhesive in a steel plate was used as test specimen. In order to design the blister test a three-dimensional finite element model was built to simulate the hydrostatic pressure resistance of a composite plate bonded in pipes with hole. CZM method with contact debonding technique has been chosen in this simulation. The results obtained from this modeling were well matched with the practical ones in terms of the pressures causing the plate failure (separation).

Keywords: composite repair, blister test, failure pressure