Analysis on the impact behaviors of E and S-glass composite elbow pipe joints exposed to impact loading followed by axial compression: analysis on impact and compression of elbow joints

ABSTRACT

This article investigates the effects of impact and compressive behaviors of impacted E-glass/epoxy and S-glass/epoxy composite elbow pipe joints. In a bid to measure the transverse impact and residual compressive strength, the composite elbow pipe joints were subjected to impact test at room temperature, followed by the axial compression test. Moreover, various impact energy levels of 10, 12.5, and 15 J were utilized to test the elbow pipe joints using an instrumented impact testing machine at room temperature. Results indicated that the force–deflection behavior and failure mechanism was more than impact energy with the type of material used. Compressive strength commonly decreases with the increase in the impact energy and the type of material used.

Keyword: E-Glass/Epoxy; Elbow pipe joints; Force–deflection behaviour; Residual compressive strength; S-Glass/ Epoxy; Transverse impact