

## **The interlaminar shear strength test of helical wound glass fibre reinforced epoxy laminates subjected to hydrothermal ageing**

### **Abstract**

This paper presents the experimental investigation of interlaminar shear strength (ILSS) tests of helical wound glass fibre reinforced epoxy (GRE) pipes subjected to hydrothermal ageing. Currently, the test is being used by composite pipes manufacturers as the alternative internal quality monitoring program for detection of manufacturing changes and reconfirmation of the design basis of composite pipes. The test specimens were cut in hoop direction from helically wound GRE composite pipes after exposure of 0, 250, 500, 1000-hour water at 80°C. The ILSS tests of the GRE samples were then conducted in accordance with ASTM D2344, and the results were analyzed to evaluate the durability performance of the laminates. The results show a clear degradation in the bonding strength between fibres and resin system interface after 500-1000-hour water exposure at 80°C. This findings show a good agreement in the trend observed with the standard qualification procedure elucidated in ASTM D2992 standard. Hence, ILSS test shows a great potential to be used as the internal short-term mechanical test method to qualify a new resin, curing agent or glass fibre in accordance to the next approach.

**Keywords** — Interlaminar shear strength test, hydrothermal, glass fibre reinforced epoxy, composite laminates