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EVALUATION OF TENSILE PROPERTIES OF VINYL ESTER/GLASS FIBER AND WATERPROOFED POLYESTER/GLASS FIBER COMPOSITES UNDER ACIDIC AND THERMAL EXPOSURE

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Abstract: Polymer composites have a wide range of chemical applications, showing strong performance in the paper, cellulose, and sugar-alcohol industries due to the chemical resistance provided by the polymer matrix. Literature reports that vinyl ester resins exhibit excellent chemical resistance for these applications; however, their commercial cost is considerably higher than unsaturated polyester resins. The aim of this study was to evaluate the chemical resistance of glass fiber/waterproofed polyester resin composites (GFWPO) and compare their behaviour with glass fiber/vinyl ester composites (GFVE). Both composites were manufactured by hand lay-up and subjected to immersion in a buffer solution with pH 3 at 70 °C for 150 days. To evaluate the mechanical behaviour after chemical exposure, tensile tests were performed and compared between the composites. The GFWPO composite presented tensile strength of 287 MPa and elastic modulus of 17 GPa, while the GFVE composite showed tensile strength of 347 MPa and elastic modulus of 18 GPa. The results indicate that waterproofed polyester resin composites can be a viable alternative for applications in corrosive environments where vinyl ester composites are traditionally employed.

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