

Effect of oil absorption on mechanical and chemical properties of carbon fiber-reinforced polymer

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This study comprehensively analyzes the adverse effects of microscale oil penetration on carbon fiber-reinforced polymer (CFRP) composites, and offers material parameter and processing condition for the improved oil-proof performance of CFRP composites. The CFRP composites were confirmed to have lower mechanical properties after impregnation with oil at elevated temperature due to microscale oil absorption in the vicinity of carbon fibers on the surface of epoxy polymer composite, and a high resin content and high heat curing conversion of epoxy polymer could reduce the oil absorption and tensile strength reduction of CFRP composite. These results will help to address the associated problems and facilitate the application of CFRP composites in the automotive or aerospace industries.