

## **The effect of surface treatment on the behavior of toughened acrylic adhesive/GRP(epoxy) composite joints**

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**Abstract—** The surface modification and adhesive bonding of a bidirectional glass reinforced polymer (GRP) composite have been investigated. Wettability studies showed that grit-blasted and plasma-treated specimens provide a significant increment in the surface energy, relative to untreated material. The most effective treatment found was grit blasting. The surface modification resulted in significantly improved adhesion between the composite and the applied toughened acrylic adhesive; a considerable increase in failure strength and in fracture energy was observed following grit blasting and grit blasting plus silane treatment. Specimens treated with atmospheric plasma showed a reduction in mechanical properties, resulting in interfacial (adhesion) failure. The durability was tested using the wedge test. Specimens treated with atmospheric plasma showed a lower durability than the other surface treatments.

**Index Terms—** GRP(epoxy) composite, acrylic adhesive, surface modification, wettability

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