Influence of Surface Treatment of Steel Adherends on Shear Strength of Filled Resins

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Adhesion of resins and adhesives to adherend is one of the important characteristics, including the area where the resin or adhesive is filled with particulate fillers in order to optimize this adhesion, achieve other mechanical characteristics or in order to reduce the price of the resulting resin or adhesive. When discussing filled resins with particulate fillers, these materials can be defined as a polymer composite systems. Surface treatment of adherend before applying such a filled resin, is crucial to the overall strength of this interface. Blasting is commonly used kind of surface treatment of metal adherends. Properly chosen blasting conditions and achieved roughness parameters are crucial to the overall strength. The experiment describes the impact of the changing conditions of blasting on the shear strength of epoxy resins filled with glass powder. The results of the experiment show that the highest shear strength on steel adherend was achieved when the surface was blasted at an angle of 60 - 90° (12.93 ± 0.62 MPa). The roughness parameters Ra and Rz were influenced by a specific kind of blasting material (Al_2O_3 F80 and glass beads B10), which has also a considerable influence on shear strength.

Keywords: Blasting, corundum, epoxy resin, glass beads, glass powder.

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