Applications of Microscopy in Experimental Description of Glass Powder/Epoxy Systems

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Composite systems are promising types of materials which due to the mechanical properties are used in a variety of industries. The resulting mechanical properties of these materials are defined by the properties of individual phases and their mutual interaction. When defining these factors it is possible to use microscopy and non-destructive methods. This paper describes the use of fluorescence confocal microscopy to describe the porosity of thermosetting resin forming matrix of systems filled with particles of glass powder. Confocal microscopy is also used to describe the surface of the steel adherent before application of the composite system when evaluating shear strength when the surface roughness parameters can be considered as key indicators influencing interfacial interaction. Electron microscopy was used to describe the size and shape of the particulate filler and mutual interaction of the filler and the matrix. Use of microscopy showed adequate interaction between the glass powder and epoxy resin. Inclusion of glass powder into epoxy resin did not lead to a statistically significant change in shear strength on steel adherent.

Keywords: Electron and confocal microscopy, interaction, size, shape, particles.

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