Influence of Cyclic Degradation in Saline Solution on Mechanical Properties of Adhesive Bonds

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The adhesive bond is the complex of three layers – adhesive bonded material (called adherent), adhesive layer and cohesive layer. Degradation aspects act all parts of the adhesive bond. The aim of this research was the evaluation of influence of degradation environment on the strength of structural two-component epoxy adhesives. Adhesive bonds and process of testing the adhesive bonds were in accordance with standard ČSN EN 1465. The degradation environment in form of 5 % saline solution was used within this experiment. Adhesive bonded testing samples were subjected to cyclic loading of saline solution. On the basis of evaluation of performed experiments it is possible to say, that resulting strength of adhesive bonds decreases at simultaneous acting of environment. The strength of adhesive bond after 8th cycle, i.e. after 56 days, significantly decreased from 67 to 78 %. Using the electron microscopy within the experimental research it was proved that the spontaneous failure of the adhesive layer occurred at 8th cycle.

Keywords: adhesive bond strength, corrosive, scanning electron microscopy (SEM), structural two-component epoxy

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