

Reliability of Bio-mechanical Systems on the Basis of the Tooth–Composite Filling System

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The tooth – composite filling bio-mechanical system (polymer composite with micro-filler) was evaluated.

The tooth specimens with filling made on the chewing surface were treated with mechanical and thermal loads simulating the conditions that can be found in the oral cavity. The tests were conducted in the laboratory, on the mastication simulator. The measurement of usage was a marginal fissure which was assessed in the longitudinal cross section of the tooth with the use of optical microscope, and on chewing surface with the use of scanning electron microscope SEM.

The results were ordered with dependence to the number of fatigue of cycles. The parameters of statistical distribution of marginal fissure size were evaluated with the use of Kolmogorv – Smirnov and Shapiro – Wilk’s tests. Anova variation analysis and post-hoc test were used to evaluate differences. The course of function of reliability was established with Weibull’s model. The risk (hazard) of damage and probability of survival were evaluated by the introduction of the author’s criterion of the limit state of the tooth – filling system.