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DETERMINATION OF MECHANICAL PROPERTIES OF METHYL METHACRYLATE ADHESIVE (MMA)

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Abstract
Experimental testing of epoxy adhesives, which are commonly used in civil engineering for the strengthening of existing structures with composite products have been a topic of limited studies. It was due to the damage which usually occurred not in the adhesive layer but in the strengthened material. Recent studies have shown that the choice of an adhesive significantly affects the load-bearing capacity of the entire joint. The paper presents the results of strength tests of a selected methyl methacrylate adhesive, carried out according to the standards EN ISO 527-1 and EN ISO 527-2. Comparing the results to the data provided by the manufacturer (tested in accordance with ASTM D638) discrepancies have been found in the normative assumptions and consequently differences in the results. Experiments on the adhesive showed clear dependency on the speed of testing which revealed through variable characteristics after the elastic limit. Numerical simulations were also carried out assuming the elastic-plastic material model. The analyses allowed to obtain the distribution of stresses and deformations along the length of the sample and allowed to verify the length of the extensometer used. Comparison of results obtained for different measuring lengths of chosen adhesive confirmed the need to use extensometers in the testing of mechanical properties.

Keywords: **Methacrylate; MMA; Mechanical properties; Influence of test speed.**