

Comparison of variables influence on adhesive bonds strength calculations

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In the sphere of the metal sheet bonding namely single overlapped adhesive bonds are used. Their production costs less and they confirm strength requirements in many cases. The great part of the single overlapped adhesive bonds research was focused on a geometrical setting of adhesive bonds, an adhesive layer thickness and on mechanical properties of adherents. The analysis of the adhesive bonds strength calculations is ignored. The calculations stated according to the standards are often simplified and they do not take into the regard an adhesive bonded material and an adhesive layer thickness. The aim of the research is to define if the adhesive bond strength calculated according to the standard ČSN EN 1465 is the same as the reduced strength according to Mohr's and Guest state of stress theory regarding the adherent deformation and the adhesive layer thickness in the calculation. The issue is solved by the experimental research and statistical testing.

Keywords: adhesive layer thickness, bonding material, reduced tensile shear strength, tensile shear strength

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Bond strength measurement is one of the most common methods for evaluating the adhesive properties of restorative materials. Various mechanical methods, such as tensile, microtensile, flexural, shear, and in-plane shear tests have been used to assess bond to dental substrate [1, 2]. Compared with conventional tensile and shear tests both microtensile and microshear tests allow standard tooth regions to be selected, thus preserving the uniformity of the testing area [3, 4]. The simple test protocol of the microshear test [5, 6] allows for straightforward specimen preparation.

2. Improvement of the industrial adhesive bonding processes.
3. Predictive modelling (development of new calculation methods to predict the joint strength).
4. Development of new test methods for joint strength measurements.

Note on 1a. Surface analysis, before and after (various methods of) surface modification provides a means of (better) understanding of the chemistry of engineering plastic surfaces and their influence on adhesion. Also lack of knowledge about adhesive and plastic surface properties and their influence on adhesion. Lack of knowledge about adhesive processing (surface pretreatment, application and curing) often results in adhesive failures.

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5. This initial stage of adhesive bonding technology should produce maximum strength adhesive bonds in the joint, and will therefore require, e.g. Refs. [4, 18, 66]:
The objective of any surface treatment method is to enhance the adhesive bond strength and durability when it is exposed to environmental factors of service. There are, however, other considerations for the formation of an adequate adhesive bond. The basic requirements for a good adhesive bond are the following