

Ultrasonic characteristics of the quality of adhesive joints

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Adhesive joints are considered to be inseparable and are commonly used in the construction of modern motor vehicles. One of the main adhesive joint types used in the construction of vehicles are adhesive (glue) joints. The most important limitation in the use of adhesive joints is the lack of an effective non-destructive method that allows the control of these joints on the production lines in factories. Research is being carried out on the application of non-destructive testing techniques to assess adhesive joints. One of the non-destructive methods used to assess the quality of adhesive joints is the ultrasonic echo technique. The nature of modern joints (connecting ever thinner sheets) makes it necessary to use high frequency (20MHz) ultrasonic transducers with water delay line. The aim of the study was to assess the suitability of various characteristics of the ultrasonic longitudinal wave for testing adhesive joints, with the special emphasis on connection of elements of modern car bodies. The ultrasonic adhesive joint quality characteristics adopted for the analysis are: acoustic pressure of the longitudinal ultrasonic wave on the ultrasound transducer, pressure reflection coefficient, number of pulses of a given height. The study confirmed that the problem of selection of the ultrasonic characteristics for the adhesive connection is a complex issue and the selection of different measures should be considered in each case, depending on the type of evaluated joints and the equipment used.