

Determining thickness of the elastic adhesive layer necessary to fix the transducers to obtain the ultrasonic cavitation using finite element method

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Abstract.

Ultrasound and their applications are currently a very important field of research with outstanding scientific and practical results. The ultrasonic system usually consists of several elements (ultrasonic transducer, reflector, amplifier, concentrator) mechanically fixed or glued together depending on the desired applications. One of the very interesting applications with special and spectacular results is based on the phenomenon of ultrasonic cavitation. For this situation the ultrasonic transducers are glued to the bottom of the tank where the ultrasonic cavitation process takes place. A very important problem is choosing the type of adhesive as well as determining its thickness. Determining the thickness is very important in the sense that too much thickness would lead to vibration attenuation and insufficient thickness would lead to detachment of the transducer. In this sense, the article tries that on the basis of the finite element method, to establish the optimal thickness of the adhesive layer that leads to the normal transfer of vibrations from the ultrasonic transducer to the tank where the ultrasonic cavitation process takes place.