

<https://doi.org/10.7250/CONNECT.2023.113>

SOUND INSERTION LOSS PERFORMANCE OF BAFFLES WITH DEVULCANIZED WASTE RUBBER

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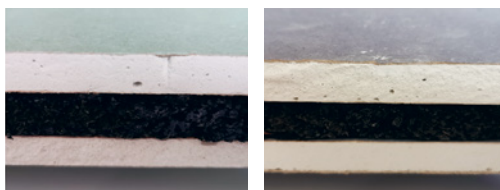
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Abstract – In this study, the insertion loss of devulcanized waste rubber baffles was evaluated. Acoustic baffles are suitable for reducing noise from the devices or machines by interfering with their emitting sound waves. Knowledge of the acoustic properties of the material used is of significant importance in ensuring the effectiveness of the acoustic properties of the baffle. Basic properties include airborne sound insulation, which is usually determined during laboratory testing. Baffle consists of sound absorbing and sound insulating materials. In this study, plasterboards were used as sound insulating material and devulcanized waste rubber as sound absorbing material. Devulcanization targets mostly the scission of sulphur crosslinks. Devulcanization techniques that have been explored in rubber recycling include thermos-chemical, microbiological, ultrasonic microwave thermos-chemical devulcanization in a supercritical carbon dioxide medium (scCO₂). In this study, two types of rubber granules were devulcanized by grinding method and one other type was chemically devulcanized. Three types of rubber granules were mixed together in increasing 25 % proportion steps and glued with patented polyurethane glue. Total of 15 different composition devulcanized waste rubber granule boards were made. Rubber boards were attached together with the plasterboards. Insertion loss of the different composite baffles was measured in semi-anechoic chamber in a purposefully designed stand in 1/3rd-octave bands. The results showed that the insertion loss of the baffles depends mostly on the rubber granule board density. Increasing the density of the rubber board, insertion loss also increased. 5–6 dB insertion loss difference was measured between the most and the least dense rubber granule board baffles.

Keywords – Baffle; devulcanization; insertion loss; rubber; sound reduction



Semi anechoic chamber and insertion loss measurement stand.



Construction of baffles with devulcanized waste rubber.