

Enhanced sound absorbing performance of flexible polyurethane foams by adding silicone rubber fillers

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Flexible polyurethane (FPU) foams are widely used as sound absorbing materials due to the high sound absorption coefficient, light weight, and ease of production. The high sound absorbing efficiency of FPU foams is derived from the porous cell structure. Therefore, the cell morphology is a key factor to improve sound absorption of FPU foams. Addition of fillers is one of the most effective methods to enhance the sound absorption of FPU foams because small amount of fillers can dramatically modify the cell morphology. In this study, silicone rubber fillers with poly(dimethylsiloxane-co-butyl acrylate) core and poly(methyl methacrylate) shell were added during the synthesis of FPU foams. Sound absorption coefficients of FPU foams were obtained with an impedance tube. Scanning electron microscope was used to investigate the morphology of FPU foams and examine the interfacial adhesion between FPU matrix and silicone rubber fillers