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Investigation of improvement methods of sound absorption in 5083 aluminum foams

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Abstract

Sound absorption behavior of A5083 open-celled foams produced by space holder method was investigated. Sound absorption coefficient of samples was investigated within the range of 500-16000 Hz, by the transfer function method. A5083 foams sound absorption was investigated by two cell sizes less than 106 and 106-250 microns. In addition, the effect of adding silicon carbide was studied with 10 vol.%. The effect of air gap depths on sound absorption coefficient was also investigated. Results indicated that A5083 foams sound absorption behavior with cell sizes less than 106 microns and 106-250 microns is very weak at most frequencies. Adding 10 vol.% of silicon carbide to A5083 foam with 106-250 microns cell sizes, improved the sound absorption properties of foams. The results of this research also indicated that using an air gap in A5083 foam with less than 106 microns cell size has no effect on sound absorption coefficient. In A5083 foam with 106-250 microns cell size and 20 mm air gap depths, at most frequencies, a better sound absorption was observed than the sample without air gap or the sample with 10 mm air gap depths.

Keywords: A5083 foam, Composite, Silicon Carbide (SiC), Sound absorption coefficient, Air gap.

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