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Tri-dimensional reticulated porous material sintered by multi-tooth
tool cutting-made copper fibers and investigation of its acoustical
performances

Ding Chen, Liang Hou*, Wei Zhou, Ruiliang Liu

*Department of mechanical and electrical engineering, Xiamen University, Xiamen, People's Republic of
China*

Abstract

This paper presents a method for fabricating a tri-dimensional reticulated porous material (TRPM) made of copper fibers and an experimental study of the acoustic performance of the TRPM. Continuous copper fibers are produced through a multi-tooth tool, and sintered using a low-temperature solid-phase sintering (LSS) technique to fabricate the TRPM. The micro morphology of fiber surface and internal structure of the TRPM are investigated. The results show that a rock-like and fine-grained morphology on the fiber surface is achieved, and the complex micro-pores in the porous material give a large specific surface area. The sound absorption coefficient and transmission loss of the TRPM are also investigated under different bulk densities and porosity characteristics.

Keywords: Porous material; Tri-dimensional reticulated structure; Multi-tooth tool; Surface morphology; Acoustic performance.

*Corresponding author. Tel. /Fax.: +86-592-2187277

E-mail address: hliang@xmu.edu.cn

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