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Effect of porosity on the characteristics of underwater acoustic sound absorbers using theoretical models

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Abstract

Porous materials have good acoustic damping characteristics over a wide frequency range. As for sound waves, many small-scale pores in the coating materials can convert underwater-coating to rough surfaces. The main property of porous absorbents is their resistance against incident sound wave that leads to damping effect. From a physical point of view, damping occurs due to friction between fluid molecules inside the cavity and absorbent structure. In this study, the acoustic properties of porous absorbents with different porosity levels have been evaluated using different mathematical models. These models use one or more parameters of materials for calculating acoustic characteristics. In all of these models, materials are considered as equivalent fluid and reactionary characteristics have not been into account.

Keywords: Sound absorption, Porous absorbent, Porosity, Acoustic characteristic.

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