

Abstract Submitted
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Mixed-porosity airfoil acoustics AREN HELLUM, NUWC-Newport —
Porous materials have been shown to reduce the noise produced by lifting surfaces. Acoustic and wake velocity measurements have been made on several arrangements of poroelastic material including full-chord impermeability, full-chord porosity, and multiple chordwise variations of mixed porosity. The "mixed" porosity arrangements are produced by changing the area fraction constructed of porous material. Two different porous materials have been employed. The results are made nondimensional and compared to published data. These comparisons indicate that the noise reduction associated with poroelastic foils is associated with the porosity rather than the elasticity of the material. A percolation-based physical model to explain elevated noise production at high frequencies is also proposed.

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