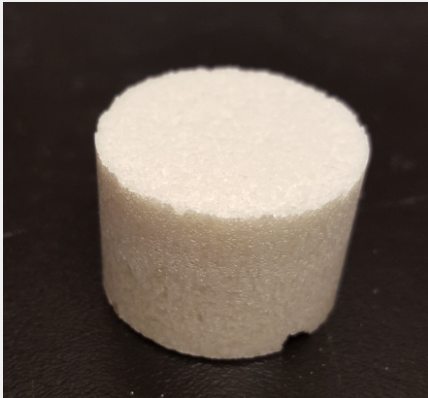




Acoustic foam with structural properties



Background

Noise reduction raises increasing awareness in the sectors of construction, transport and especially aeronautics. As a result, the demand for lightweight, inexpensive materials with interesting properties is growing and has not been met yet. Among various noise attenuation systems, open-cell foams are particularly interesting because their porous structure allows important interactions with sound waves, which leads to good acoustic dissipation. However, they often lack interesting mechanical properties. Currently, the only acoustic foams available on the market that gather both those characteristics are metallic ones. But, due to the complex and often non-reproductive manufacturing processes, these metal acoustic foams are very expensive.

Technology

Prof. Annie Ross and her team have mastered those challenges by developing a new polymeric foam with both acoustic and mechanical properties. The process consists in mixing thermosetting resins and crystals of controlled size and applying a pressure to ensure an interconnected network. The mixing is then cured and leached with a solvent to completely remove the crystals of the final material. This process allows for a very high porosity ratio (up to 90%) as well as very good control of both porosity and cell size. In addition, this technology offers gradient of porosities which is particularly useful to target and absorb a broad range of acoustic frequencies especially in the lower frequency range. Most importantly, the fact that the foam is a thermoset confers it very advantageous mechanical properties along with a high acoustic absorption coefficient.

Application

The main applications are foreseen in the transportation sectors with high production costs (aeronautics, railway, etc.) where there is a need for light and versatile materials. Due to its inexpensive manufacturing process, this foam could also be used in the construction sector that is mainly cost-driven.

Competitive Advantages

- Very high porosity rate (up to 90%)
- Versatile foam with both acoustical and mechanical properties
- Open pores of various size allowing to absorb multiple range of frequencies
- Low cost process, easy to implement

Patent

US Provisional Patent Application "Openly porous acoustic foam, for manufacture and process thereof"

Next Steps

The technology is available for licensing. We are looking for an industrial partner to collaborate with the team to develop the process further.

Contact

Morgan Guitton, Jr. Eng.
Project Manager, Business Development,
Sciences and Engineering
Univalor
+1 (514) 340-8510
morgan.guitton@univalor.ca

Annie Ross, PhD
Professor
Department of Mechanical Engineering
Polytechnique Montreal
+1 (514) 340-4711 ext. 4591
annie.ross@polymtl.ca

