

Noise pollution is one of the factors affecting the quality of life in developed urban areas with high population density. Although there are commercially available sound absorbing materials such as polyurethane, rockwool, woodwool and cotton fibres, they may not be the most ideal options to use. Besides the limited noise absorbing performance at relatively low frequency range, polyurethane foams tend to fade and turn yellow over time with prolonged exposure to daylight, while the fibres and dust of rockwool have proven to be hazardous to health.

The IMRE Solution

IMRE has developed a piezo-foam material with superior noise mitigation performance. Some key features include:

- superior airborne acoustic absorption performance, particularly in the low frequency audible range below 1.5 kHz, which is the major constituent of noise in urban areas
- efficient flame retardant properties
- resistance to erosion and chemicals
- passive noise absorption technique which does not require any external source of electrical energy nor complex algorithm for control

Noise Absorption Foam

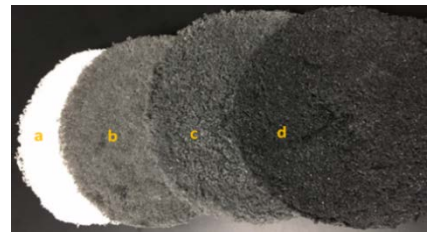
Potential Applications

- Integration of noise mitigation functions in vehicle and infrastructure design, e.g. in 'Green' buildings to reduce noise pollution; in music studios, in acoustic product designs
- Personal noise protection equipment

Collaboration Opportunities

- Scale-up for industry manufacturing
- Licensing for production

About the Technology



Samples of various IMRE-developed sound absorbing foams (a, b, c, d, with different compositions leading to differences in colour and performance)



Prototype of IMRE-developed noise absorbing panel

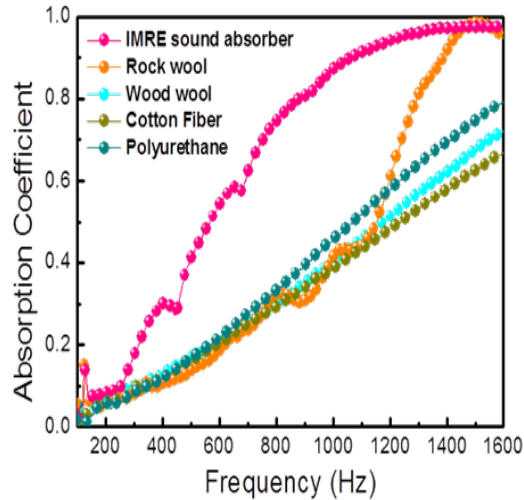


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Performance Data



Comparison of sound absorption coefficient between piezo-foam from IMRE and some common sound absorbing materials. All samples with same thickness (25 mm) were tested in a standard commercial acoustic tube. The IMRE piezo-foam demonstrated superior sound absorption performance.

Comparison between piezo-foam from IMRE and several commercially available sound absorbing materials

Properties/Absorber	IMRE Piezo-foam	Polyurethane foam	Rockwool panel	Woodwool panel	Cotton fibre
Flame retardant	✓	✗	✓	✗	✗
Ageing resistance	✓	✗♥	✗❖	✗	✗
Chemicals resistance	✓	✓	✗✦	✗	✗
Health hazard	No	low	High ❖	No	Medium
Absorption at 800 Hz♣	70%	33%	31%	31%	30%
Absorption at 1200 Hz♣	91%	57%	57%	52%	48%
♥	Polyurethane foams will fade and yellow over time, with prolonged exposure to daylight.				
❖	Rockwool, like asbestos is made from rocks and minerals. The fibres and dust have proven to be extremely hazardous.				
✦	Rockwool has a high pH, and a high water retention capacity.				
♣	For all absorbers, samples with same thickness (25 mm) were tested in a standard acoustic tube.				