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Manufacturing high-efficiency noise-absorbing materials from recycled plastics

Some technical features of acoustic metamaterials related to the project



- 1. Acoustic metamaterials can be purely structural materials
- 2. Flexible in material choice with well maintained acoustic performance
- 3. The manufacturing technology could be adaptive to multi-type recycled plastics as raw materials to manufacture the structure
- 4. Spectrum customization can be achieved through the design of the subwavelength complex structure

Manufacturing process of acoustic metamaterials



Upcycling plastics to manufacture acoustic metamaterials for noise control



Outdoor and indoor noise control products could be manufactured using recycled plastics. Even more product lines will be in the process of adopting the same strategy.

The production technology could be extended to manufacture acoustic metamaterials from different levels and types of recycled plastics as raw materials.

This project will provide lock-in storage of recycled plastic for up to **10-15 years**, in the form of noise barriers, much longer than conventional recycling tech, and **reduce the carbon emission for both recycling process and replacement of conventional acoustic materials**.

The chain for upcycling

Plastic Wastes

Collection

With

Stakeholder group 1

Puel

Consumer brands, retailers, disposal and recycling programs, etc.

Recycling facility

Multi-type sorting and granulation

Performed by supply chain

Duplicable in other cities

Metamaterial mass production facility using recycled plastics

> Developed by this GTF project

Market

1. Replacement of conventional acoustic materials

2. New acoustic metamaterial parts Stakeholder group 2

Stakeholder group 2 Government contractors and private developers



Noise Control Using Acoustic Metamaterials



Outdoor noise control solutions

Indoor noise control solutions

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