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Innovations in Soundproofing Solutions Enhancing Comfort and Sustainability:The Future of Noise Reduction

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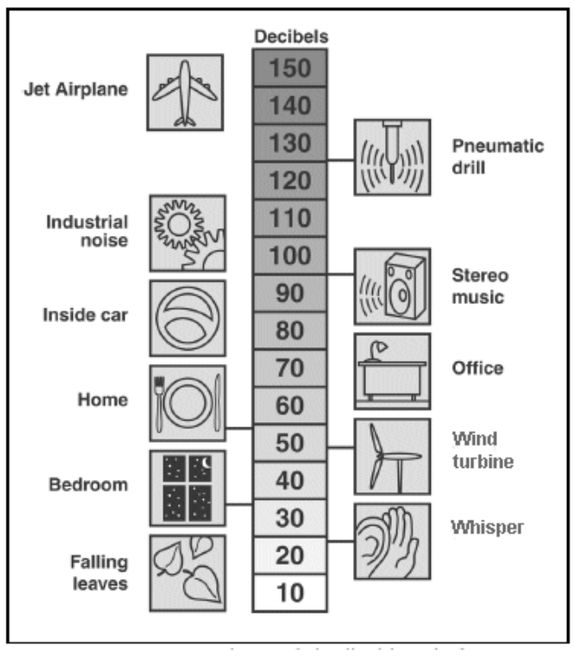
DAAD

1. Impact of Noise Pollution

- Hearing loss
- Annoyance leading to sleep disturbance causing depression, cardiac hypertension, stroke
- Congenital diseases
- Decreased Productivity

Needs a proactive approach for a healthy and sustainable future

Proposing a Sustainable Solution to Noise Reduction



2. Understanding Soundproofing Solutions

Traditional Methods –
i) Added Mass e.g., Thicker windows
ii) Adding insulation to wall surface

Advanced Techniques –
i) Introduction of double wall membrane
ii) Smart structure concepts

3. Acoustic Insulation

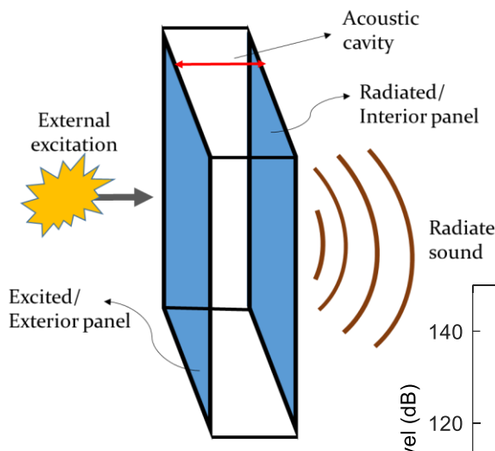
Traditional insulation materials – Fiber glass etc.
Sustainable alternative –
a) Jute fiber
b) Foam made from coconut coir
c) Woven bamboo sheet etc.

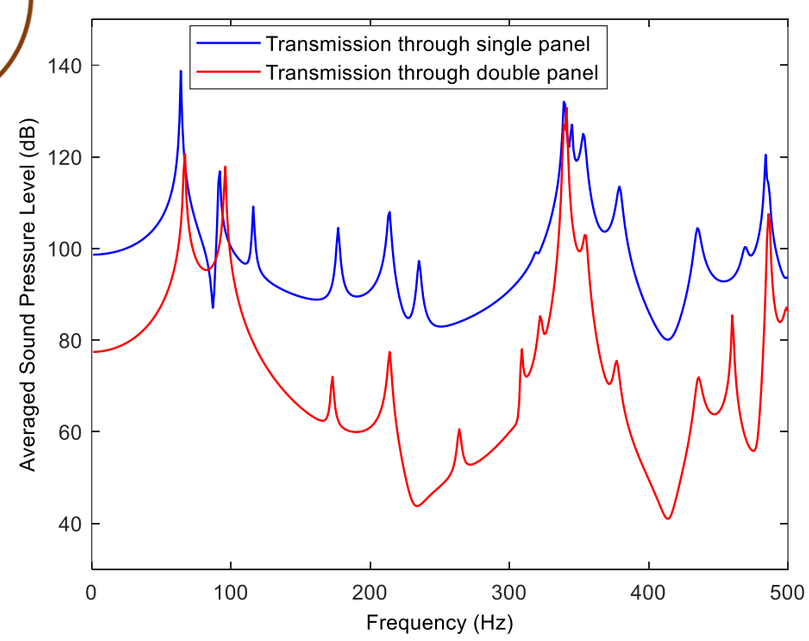
Work is planned to estimate Acoustic impedance of these new materials

References:
1. JASA, 135(4), April 2014
2. J. Vib & Acous, 139(4), 2017
3. J. Brazilian Soc. Mech. Sc. & Engg., Oct., 2023

4. Soundproof Windows and Doors

Specially engineered doors and windows
- Double glazed windows provides noise and thermal insulation
- Multilayer door panels separated by air/absorbing material

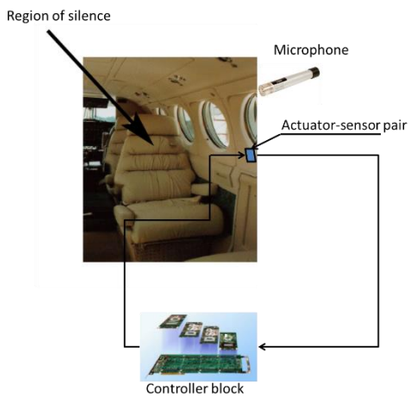


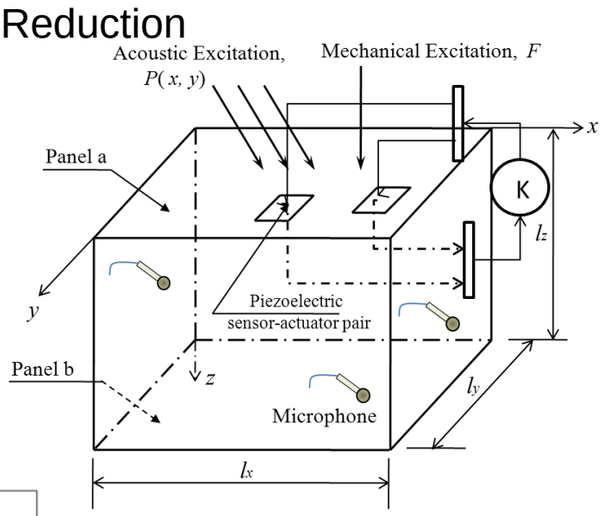


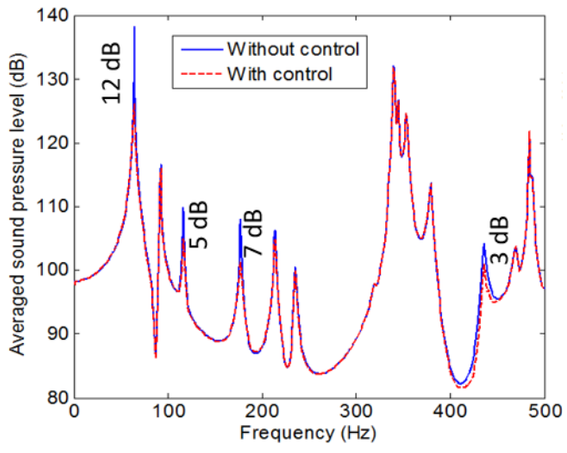
Averaged sound pressure level transmitted through single panel window and double panel window

5. Vibration Damping Systems

Smart Technology for Noise Reduction







Averaged sound pressure level (uncontrolled and controlled)

6. The Future of Soundproofing: Sustainable and Smart

- Soundproofing solutions should be sustainable evolving to align with eco-friendly practices.
- Focus should be on Innovations in materials and manufacturing to reduce environmental impact.
- Integrating Smart technologies with soundproofing systems to provide more control and personalized experiences