

# Soundproofing

Dimitris Kafetzis



**GREECE-TEAM E.F.I**  
Hellenic Physical Society



# Contents

- The problem
- Theory
- Hypothesis
- Methods and materials
- Experiment
- Results
- Conclusion



# The problem

It is sometimes necessary to reduce unwanted noise in a closed space.

Test various methods to soundproof your room.

# Theory

Sound insulation is the isolation of a room from the sound.

The sound is divided into sound emitted by air (due to vibration of the air) and stereo sound (due to the impact of solid or solid vibration).



# Theory

The permeability of sound complies with the "law of mass" in acoustics. The larger the mass, the harder the vibration of this material, the better the insulating property.

Therefore, it is preferable to choose dense and heavy material (brick) as soundproof material. The best way to isolate solid sound is to use unbound structure (felizol)

# Methods and Materials

- A paper mobile box (15 cm x 8.5 cm x 5.5 cm)
- A ringtone of phone( a specific repeated sound) to create a sound

# Methods and Materials

- Soundproof materials



# Methods and Materials

- Soundproof materials



Cotton

Plastic(transparency)

Felizol

# Hypothesis

Our hypothesis is that styrofoam will be the best soundproofing material and the plastic(transparency) wil be the worst.

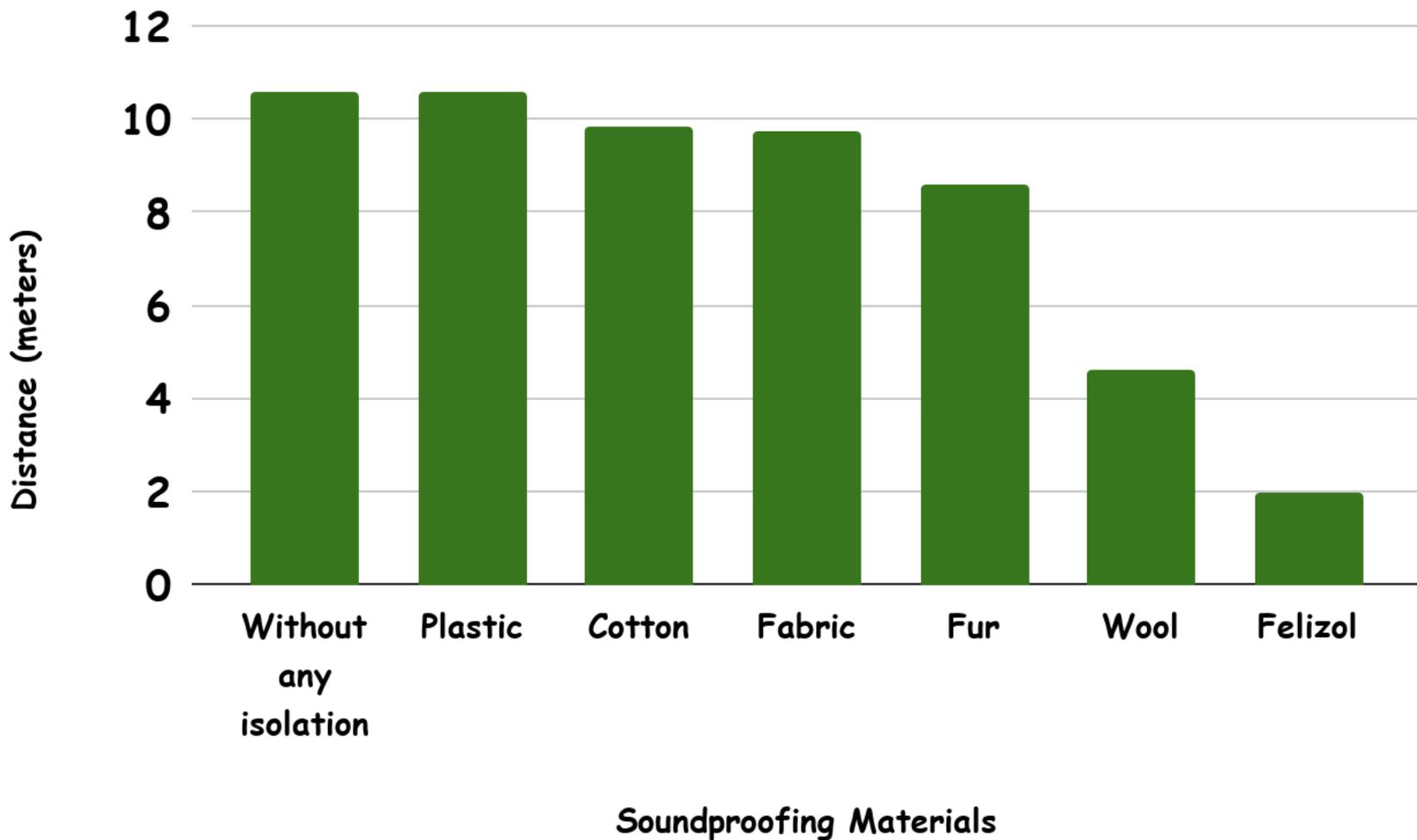
# Experimental study

- I cover my phone with different soundproof materials in a paper box so there is no gap under or above the phone.
- When my phone start ringing I calculate the meters needs to stop listening the sound with time with different materials inside.



# Results

<b><u>Soundproof materials</u></b>	<b><u>Distance (meters)</u></b>
<b>Without any isolation</b>	<b>10.6</b>
<b>Fur</b>	<b>8.6</b>
<b>Fabric</b>	<b>9.75</b>
<b>Wool</b>	<b>4.6</b>
<b>Cotton</b>	<b>9.85</b>
<b>Felizol</b>	<b>1.95</b>
<b>Plastic</b>	<b>10.6</b>



# Conclusion

## We observe...

We tested soundproofing material using a box and a specific ringtone. Our results showed that styrofoam is the best soundproof material and the worst is the plastic (transparency) so our Hypothesis completely true.

# References

<https://www.sciencedirect.com/topics/engineering/sound-insulation>



*Thank you for  
your attention*