



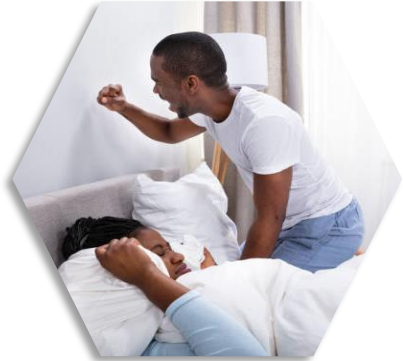
PHONONIC VIBES

THE METAMATERIAL EXPERIENCE

19th July 2022



1 PROBLEM: NOISE IS EVERYWHERE



AT HOME

+48% of noise complaints
during the lockdown



WHILE TRAVELING

+1.1 Bn passengers travel
in EU every year



IN CITIES

200,000 km railways in EU
20% close to Urban areas

30% of world
population has **trouble at
sleeping** due to noise
pollution

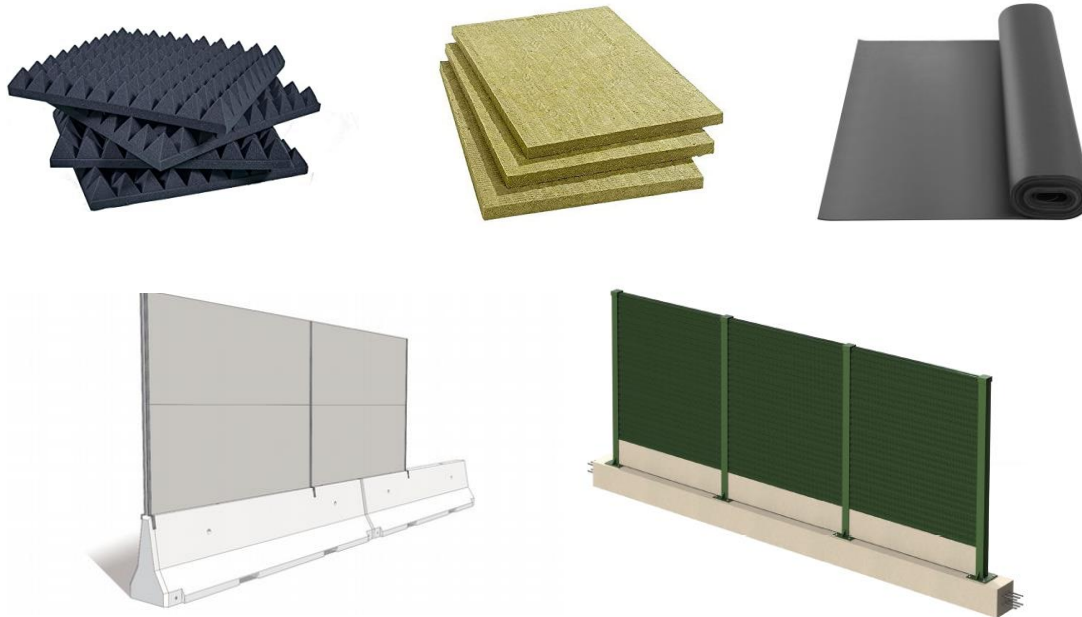
22 Mln people
per year develop
**chronic
irritability**

48k
heart attack
yearly cases due to
noise pollution

2 PROBLEM: EXISTING SOLUTIONS LACK BEHIND

The market willingness to pay for silence is not yet met by solutions with outstanding performances and sustainability

Main solutions on the market:



Raw material dependent

Non recyclable

Now for higher performances
Only strategy: Heavier & Bulkier

Low frequency - Dependent on physical mass
High CO2 emission

Not cost efficient

3 VISION & MISSION

Silence
is the new Sound

Phononic Vibes
reinvents the concept of
noise management

returning to people their
most scarce resource today



3 TECHNOLOGY

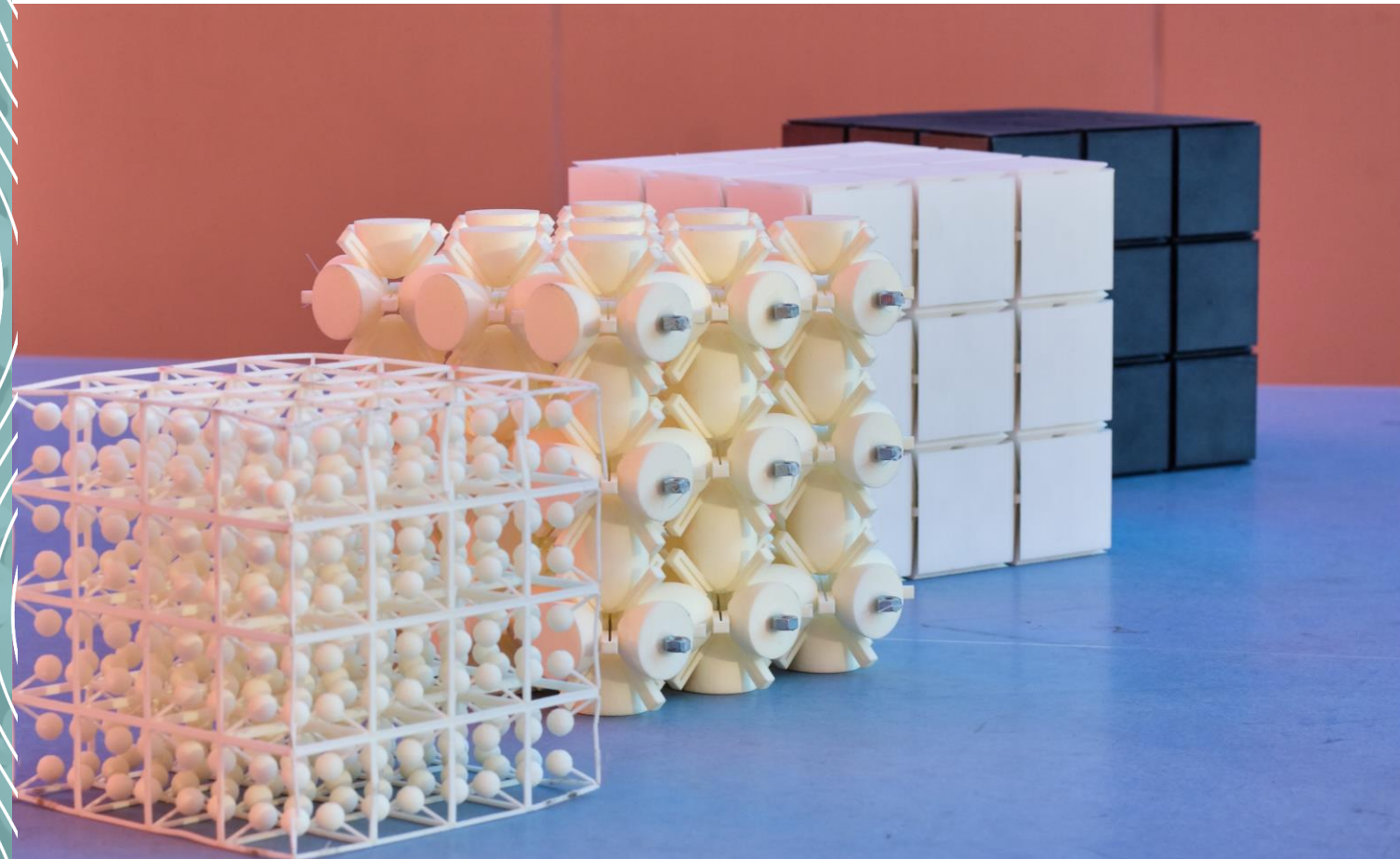
- Development & Application of **MetaMaterial** Technologies
- Design of innovative **products** to dampen out noise and vibrations
- Absorbing and controlling energy propagation
- Independent from the raw material through **reengineering** of surfaces
- TRL* 3

*Technology Readiness Level



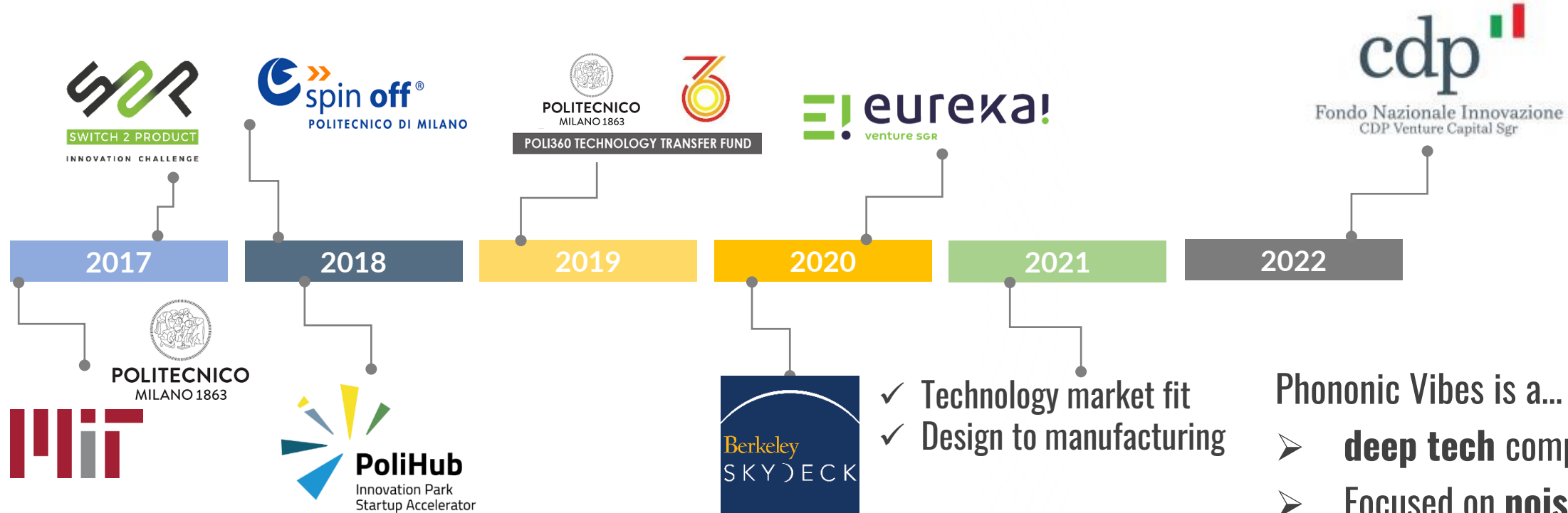
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THE METAMATERIAL EXPERIENCE

MetaMaterial: **Meta** (μετά) means “**beyond**” in Greek.
Modular structure which works for **every material** and **dimension**.



3D printing lab prototypes

4 INTRO & HISTORY PHONONIC VIBES



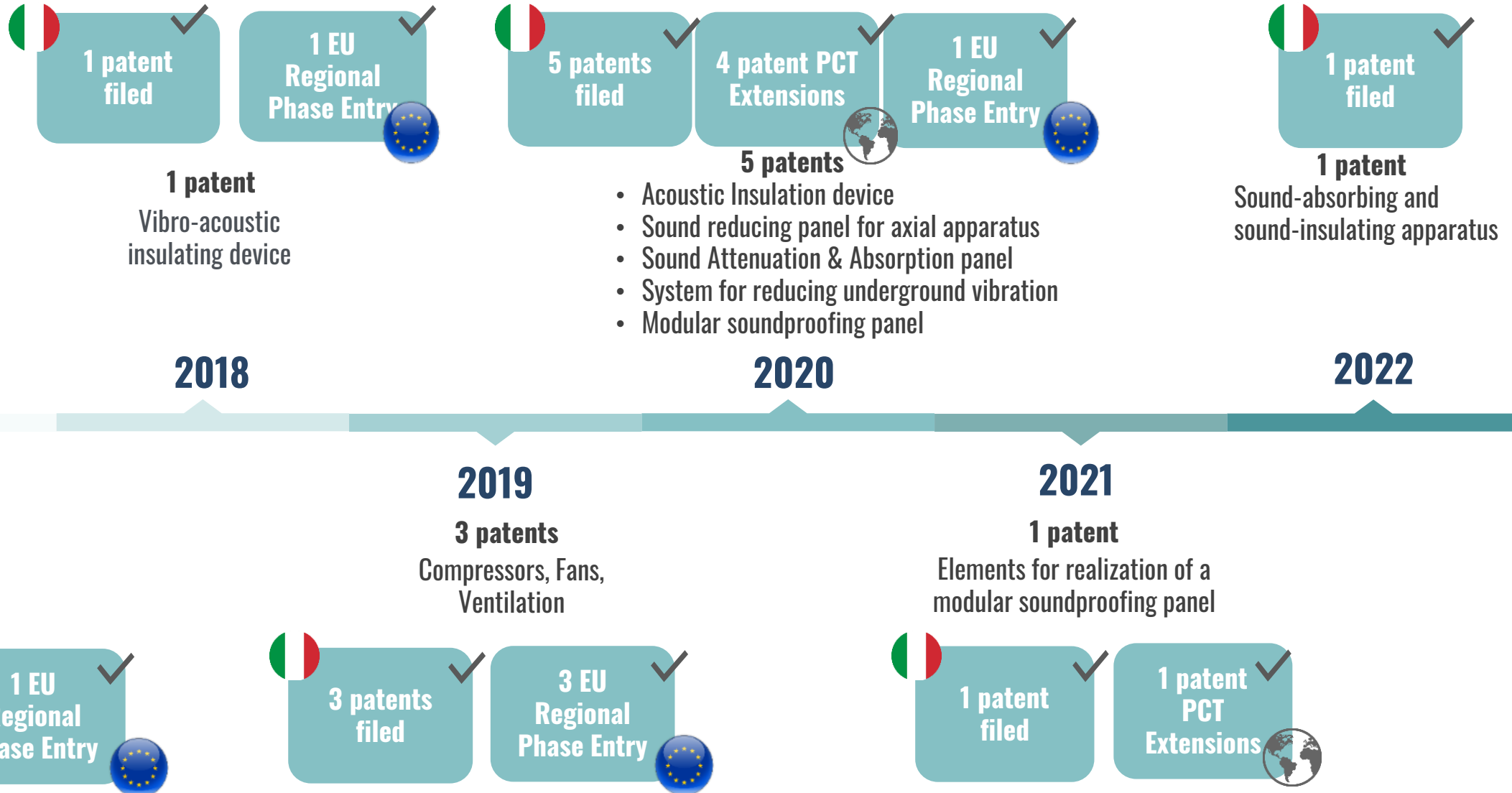
Phononic Vibes is a...

- **deep tech** company
- Focused on **noise&vibration** absorption and isolation
- using proprietary **MetaMaterials** technology solutions
- with a **circular economy approach**



5 INTELLECTUAL PROPERTY

12 patent portfolio on the **MetaMaterial Technology** and its applications.



6 MARKET SEGMENTS & TRACTION

High margins applications



INFRASTRUCTURE

€ 100 Bn



TRANSPORTATION

€ 30 Bn

Adler Pelzer Group



APPLIANCES

€ 30 Bn



7 FOUNDERS & PARTNERS



PHONONIC VIBES
THE METAMATERIAL EXPERIENCE

Co-Founders



Luca D'Alessandro, PhD

CEO
PhD, Structural Eng.



Giovanni Capellari, PhD

Product Manager
PhD, Machine Learning.



Stefano Caverni, PhD

R&D Manager
PhD, Structural Eng.



Board Members



Marino Giocondi

Board member
*Senior Partner at CDP
Venture Capital*



Andrea Boeri

Board member
30+ years experience management
McKinsey
& Company



Cesare Maifredi

Board member
General Partner



**Alberto
Sangiovanni-Vincentelli**

Chairman of the Board
Co-Founder **cadence** **SYNOPSYS**
*Full Prof. Electrical
Eng. & Computer Science*



Stefano Peroncini

Board member
CEO



Renato Mazzoncini

Board member
CEO



Shareholders



7 METATEAM

14
People
50% with
PhD



PHONONIC VIBES
THE METAMATERIAL EXPERIENCE



Luca D'Alessandro, PhD
CEO
PhD, Structural Eng.

NEW

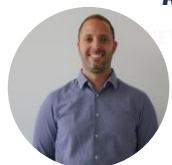
Product Development & Production

Corporate

Our Facilities

Acoustic Lab

Acoustic Lab Managers



Luca Sangiuliano, PhD
R&D Manager
PhD, Mechanical Eng.



Stefano Caverni, PhD
R&D Manager
PhD, Structural Eng.

Acoustic Specialists



Paul Charkaluk
Master Degree in Mechanics



Giada Kyaw Oo D'Amore, PhD
PhD, Mechanical, Naval, Energy and Production Eng.

Product Dev. Manager



Stefano D'Angelo
Program Manager
Experience as a Project Engineer

Fablight Manager



Rosa Spatafora
Junior Prod. Dev. Manager
Master Degree in Design & Eng.

Product Designer Manager



Giulia Monti
Senior Prod. Designer Manager
Exp. as a product Designer Luceplan



Paolo Ricci
Senior Prod. Dev. Manager
Experience as Project Manager

Structural, Costification & Certification Engineer Manager



Tiziana De Dominicis, PhD
Senior Prod. Dev. Manager
PhD, Structural Eng.

HR



Iva Cota
HR & Office Manager

Corporate Manager



Giovanni Capellari, PhD
CFO and Corporate Manager
PhD, Machine Learning.

Admin



Rosa Maria D'Alessandro
Admin Manager
Master in Business Economics

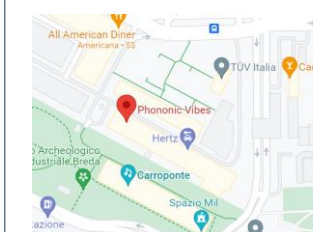
Grants



Lucia Fornasari, PhD
EU & Italian Grants Dev.
PhD, Photonic MetaMaterials

Lab & Fab Space

Via Giosuè Carducci, 125, 20099 Sesto San Giovanni (MI)





PHONONIC VIBES

THE METAMATERIAL EXPERIENCE

Thank you.

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www.phononicvibes.com/



8 USE CASE #1 INFRASTRUCTURE ACOUSTIC: RAILWAYS

MetaWindow: The first transparent high absorbing acoustic panel for a quiet and sustainable railway environment



PHONONIC VIBES
THE METAMATERIAL EXPERIENCE



**The First
Transparent
High Absorbing
Acoustic Panel**

High Absorption Performances



MetaMaterial technology

- Noise Absorption: $\alpha_w=0.95$
- Noise Insulation: $R_w=31$

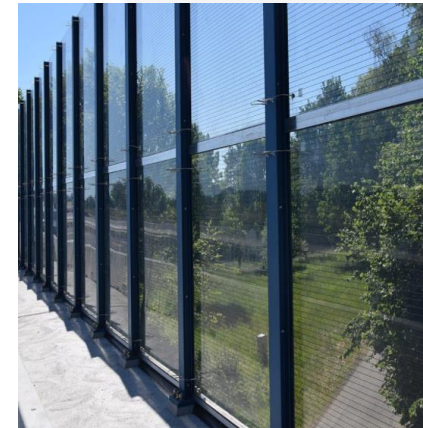


Transparency & Design



Sustainability

Transparent panels made of **recycled PMMA**.



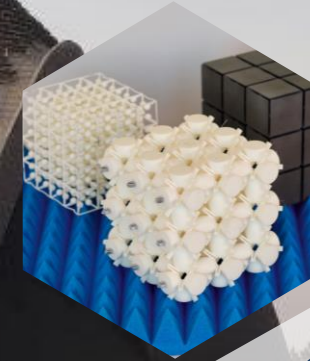
Standard market
solutions:

No absorption

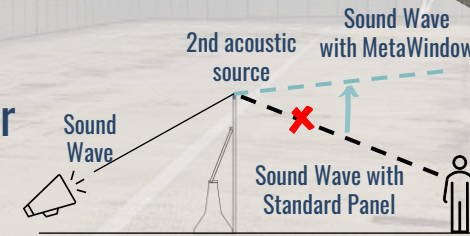
No design

8 USE CASE #2 INFRASTRUCTURE ACOUSTIC: CONSTRUCTION

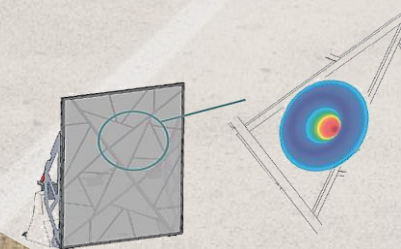
Patented MetaMaterial based Technology
Material saving thanks to tech:
2 m panel performance of 4 m



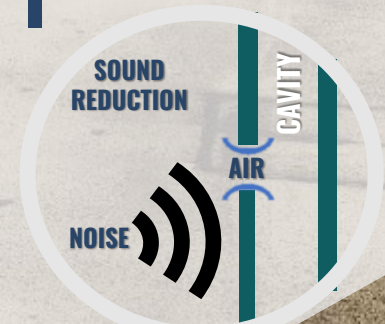
Anti-diffractor



Unit Cell Drum Effect



Slit Effect



High Acoustic
Insulation
Performance



Transparency
& Urban Design
GIUGIARO
ARCHITETTURA
& STRUCTURES



Safety standards



3.000m²
installed



Sustainability
Panels made up to
100% recycled and
recyclable materials

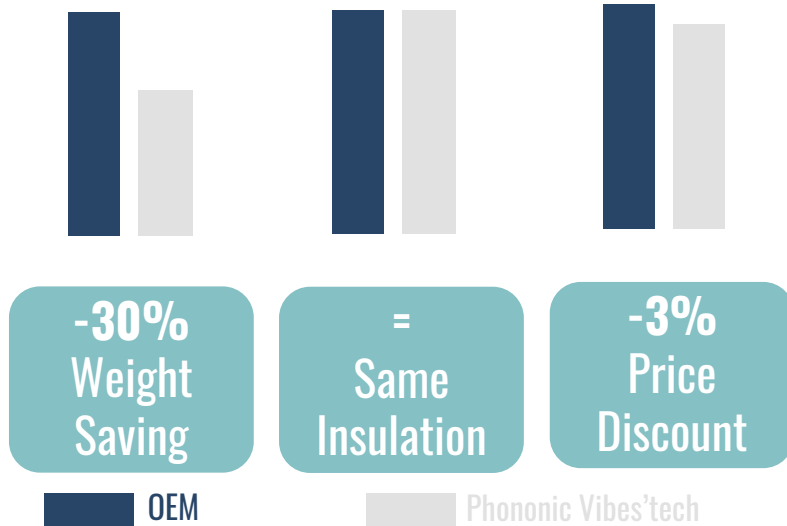
8 USE CASE #3 TRANSPORTATION: AUTOMOTIVE

Functionalized MetaMaterial layer allowing Mass saving and Sound Insulation

Value Proposition: HIGHER MARGIN

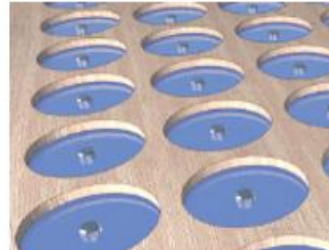
Automotive industry – High volumes
Material cost - Strongly related to the final cost

- Less CO2 emission
- OEM: Better car performances
- Tier 1: Higher Margin



How it is produced

Technology designed by Phononic Vibes
and production by industrial partners



SURFACE
RADIATION

Phononic Vibes defines
Mass optimization and
molds geometries

+



INJECTION MOLDING

Injection molding

Partnership structure:



Results
consideration by
our OEM's client:

“This is a very detailed and
extended *activity*
–nearly a PhD-Thesis :-)”

*OEMs: Original Equipment Manufacturer is an organization that makes devices from component parts bought from other organizations.

8 USE CASE #4 APPLIANCES: KITCHEN HOODS

MetaHoneyComb: Sound Absorption Solution made of Recyclable Materials & allowing Material Saving

Sound Absorption Tunable



Frequency range tuning thanks to MetaMaterial Technology



Sustainability

100% Recyclable Material (Alufoil)

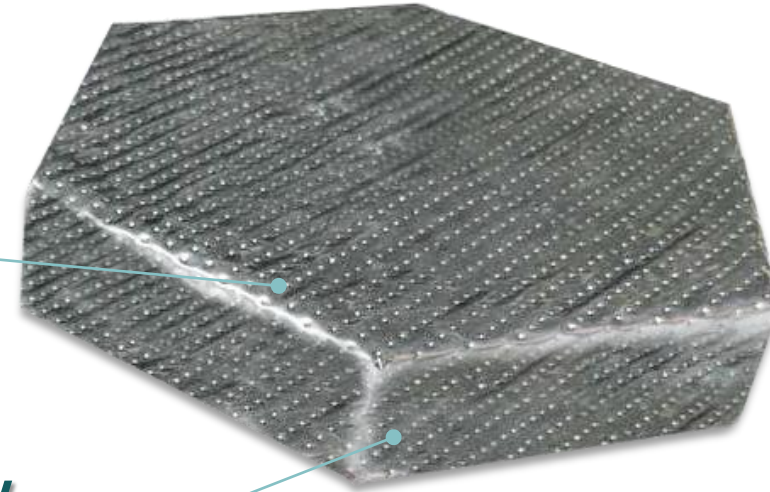


Material Saving

Modular solution and material saving

0.7%

SOLID MATERIAL
ALUFOIL ABSORBING
LAYER



99.3%

AIR VOLUME
AIR CAVITY



Current market solutions:

Melamine Foam

100 % Solid Porous Material
Not eco-friendly

Not cost efficient