

Acourete

Material Akustik dan Penggunaannya dalam Bangunan

R. Arief Yudhistira
Head of Sales Acourete

Yana Muhamadinah
Acoustic Product Consultant

Outline

Acourete

Pengenalan Akustik

Permasalahan Akustik

Material Akustik

Studi Kasus



ABOUT OUR COMPANY

Acourete

Acoustics and Noise Control Company

Distraction takes many forms in various locations, such as rain, footsteps, engine noise, airplanes, road traffic noises, and music. In addition to the various disturbance challenges, there are also architectural challenges where materials must be able to blend in with the architectural design. Then, physical challenges in the form of extreme conditions such as humidity, air temperature, dust, and others.

Since 2006 Acourete (Acoustic Revolutionary Technology) has been present in Indonesia to answer all the challenges that have been mentioned. With the spirit of revolutionary thinking, Acourete comes with revolutionary technology, to answer various challenges that are difficult to overcome with generic products available in the market.

We have best revolutionary material solutions,

1. High acoustic performance
2. Easy to apply
3. Blend with design challenges and environmental conditions
4. Meet the criteria for green and healthy buildings.

Come join us to carry out the Technological Revolution to produce healthy sound quality !

PRODUCTS SOLUTIONS



Acoustics for Transportations

Noise Control inside the transportation



Building Acoustics

Noise control from Around The Building or Room



Architectural Acoustics

Noise Control Around The Room



Acoustics for Industrial

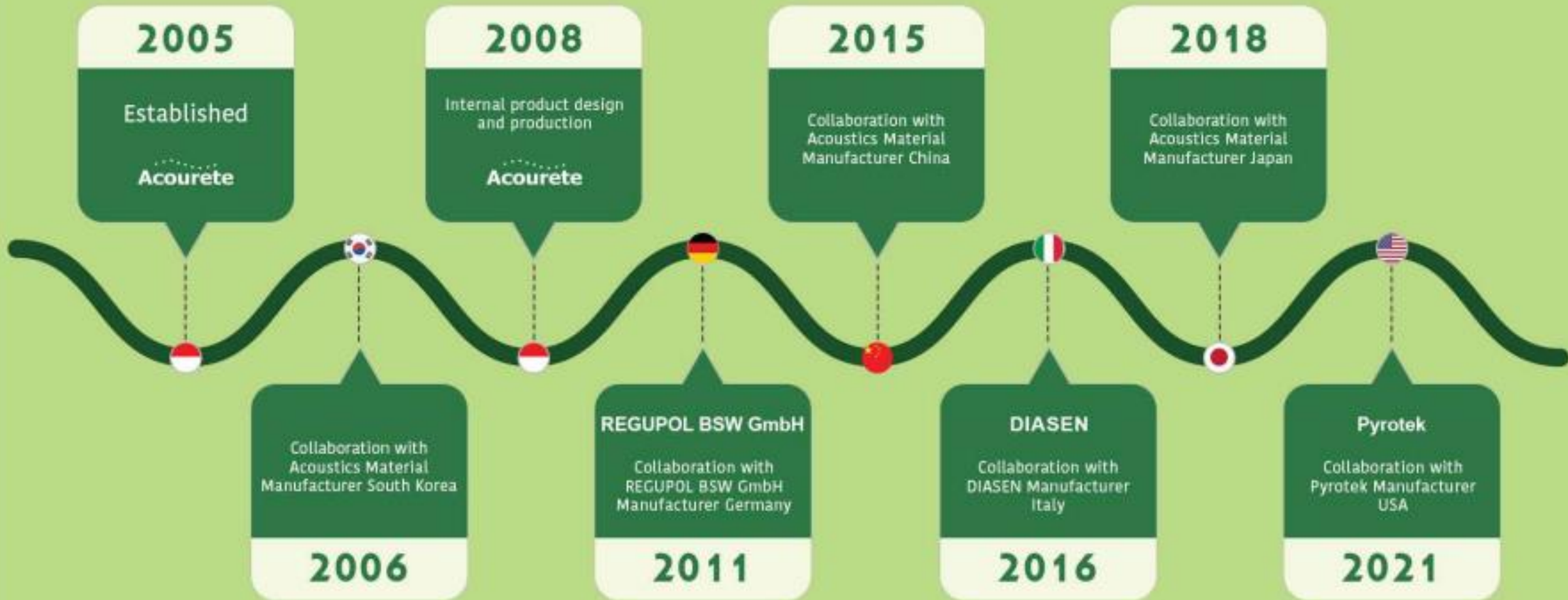
Industrial Machinery Noise Control and Around The Room



Acoustic Treatment

Noise Control for Better Quality

PRODUCT DEVELOPMENT OF ACOURETE ACOUSTICS





OUR CLIENT

FOR ALMOST 20 YEARS, ACOURETE HAS BEEN TRUSTED TO ASSIST IN COMPLETING MORE THAN 100 ACOUSTIC PROJECTS

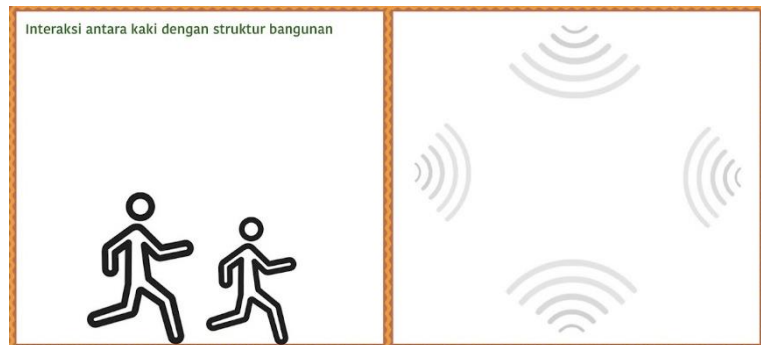


Definisi Akustik

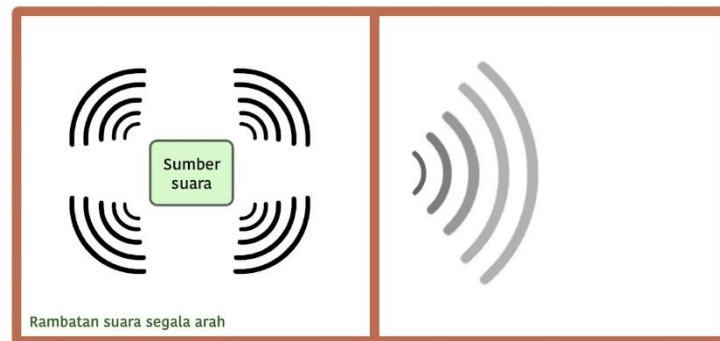
- **Akustik** adalah ilmu yang mempelajari **bagaimana suara** terbentuk, bagaimana suara merambat, dan bagaimana suara diterima oleh lingkungan
- Lingkungan akustik yang baik dapat meningkatkan kualitas fungsi ruang dan juga kenyamanan penghuni.

Permasalahan Akustik

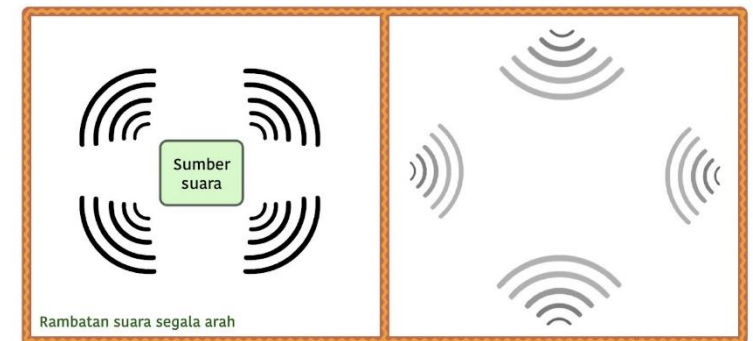
- *Kebisingan suara (noise)*
- *Kebocoran suara*
- *Kebocoran getaran (vibration/impact)*
- *Berkaitan dengan bagaimana cara menginsulasi ruangan (soundproofing)*



Impact Noise



Air-borne Noise



Structure-borne Noise

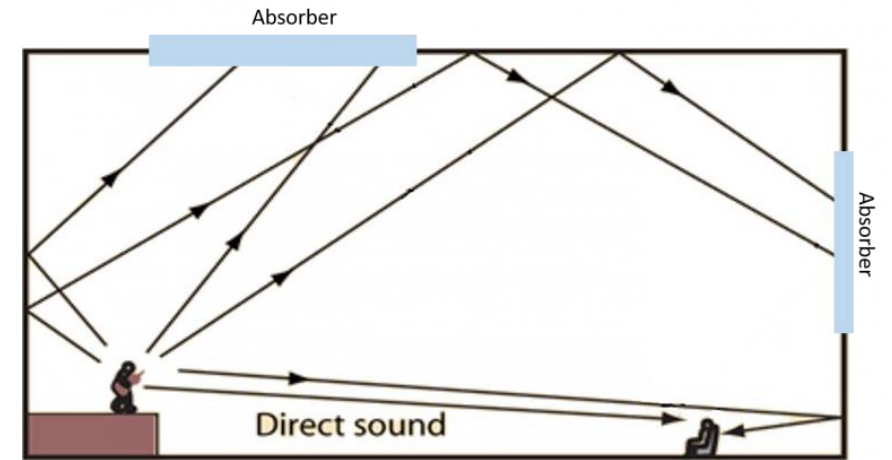
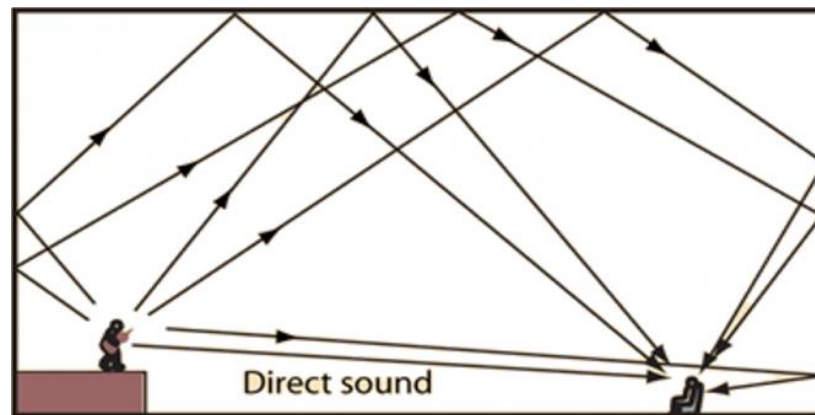
Permasalahan Akustik

- *Gaung (echo), Gaung Berulang (flutter echo)*
- *Berkaitan dengan bagaimana cara mengurangi gaung dalam ruang (akustik ruang)*

Didominasi material reflektor

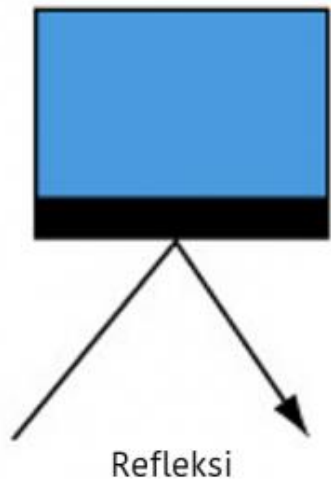
Bentuk ruangan

Peletakkan pengeras suara (speaker)

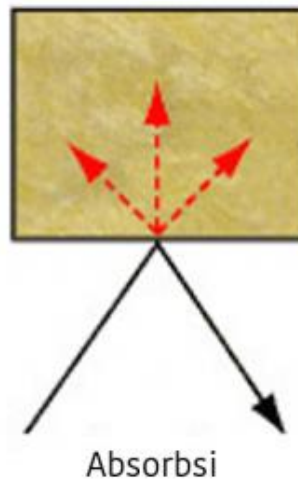


Material Akustik

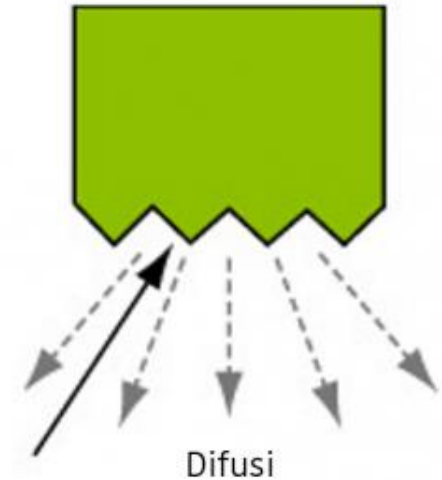
- Material akustik digunakan untuk **mengurangi permasalahan akustik** yang muncul pada suatu ruang.
- Jenis material akustik dibedakan berdasarkan **sifat material terhadap suara**.



Material Insulasi



Material Absorber



Material Diffuser

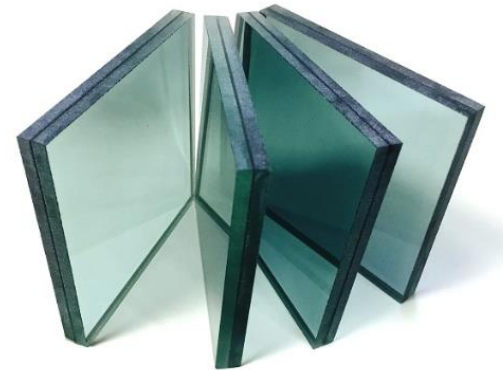
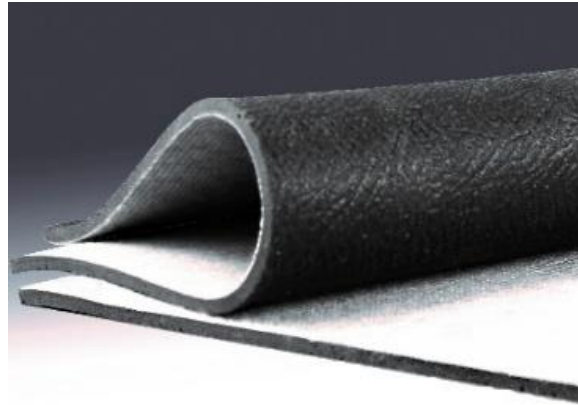
Material Akustika Bangunan – Insulasi Suara

Karakteristik material

High density

High mass

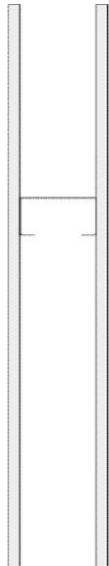
Non-porous



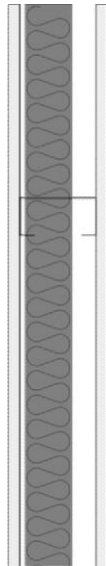
Performa dilihat dari STC (Sound Transmission Class)

Material Akustika Bangunan – Insulasi Suara

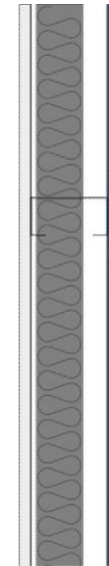
Perbandingan partisi *tanpa* dan *dengan* material insulasi



Tanpa material insulasi



Dengan material rockwool



Dengan material rockwool + Acourete Noise Armour



ACOURETE NOISE ARMOUR

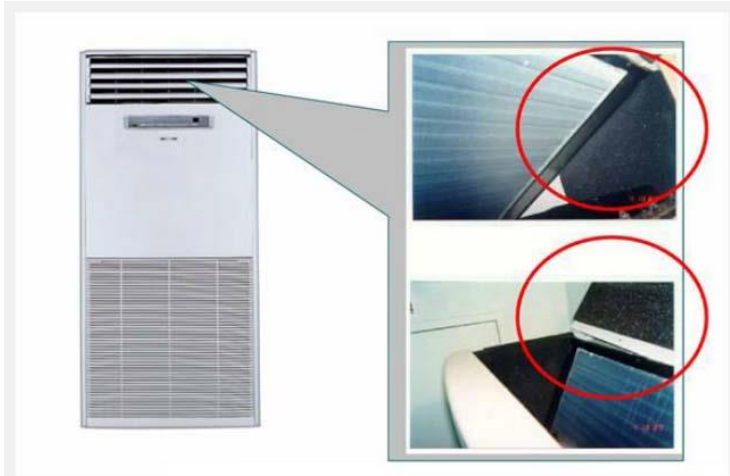
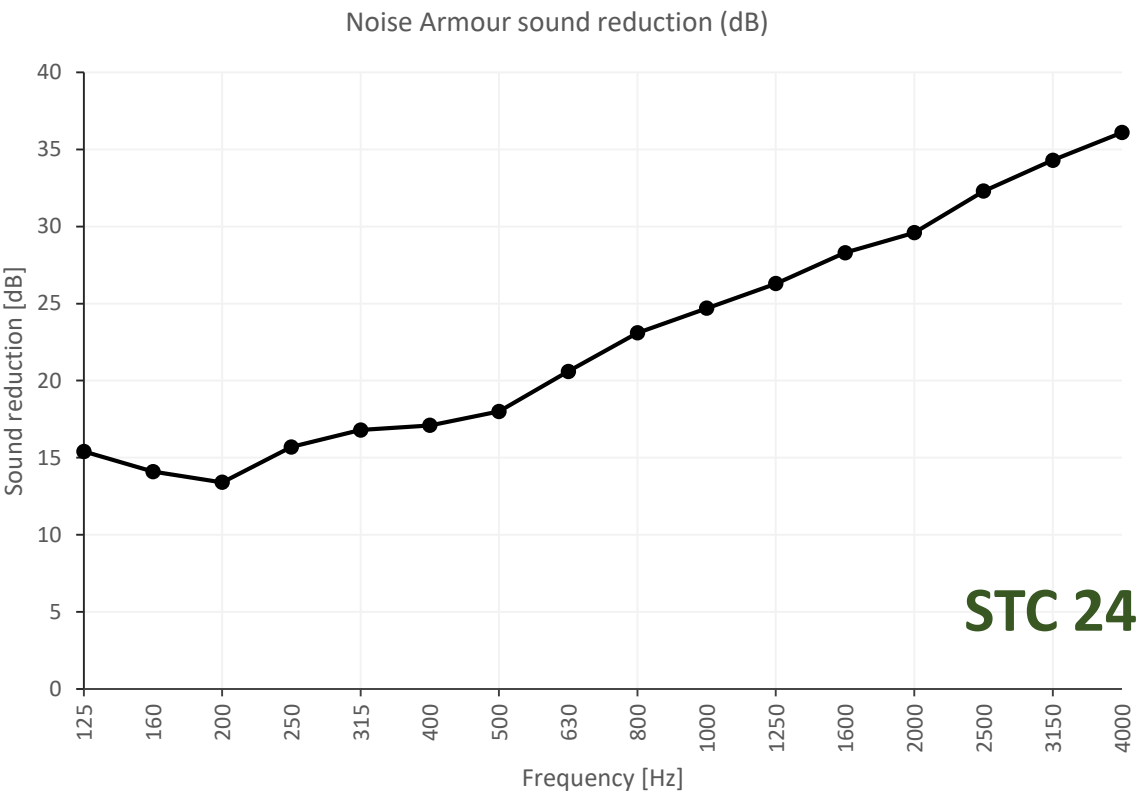


Description	Value
Type	Acoustic Vibration Insulation
Dimension	1.000 mm x 1.000 mm x 2 mm
Material	Resin
Mass	4 kg
Density	2.000 kg/m ³
STC	24
Color	Black
Country of Origin	South Korea

Broadcast studio, Music recording, Home theater, Karaoke room, Auditorium, Music hall, Discotheque, Office, Machine room

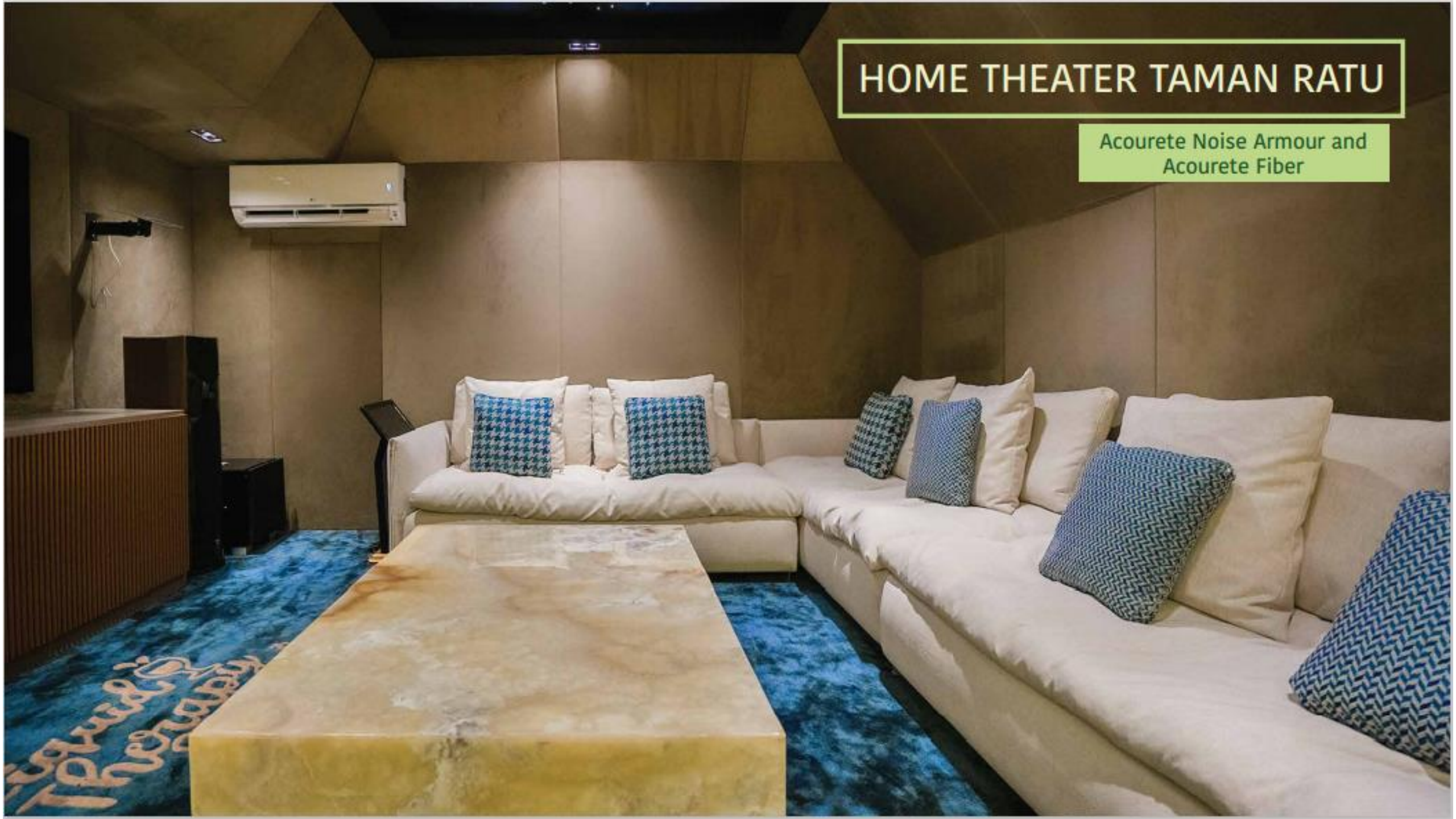
Allergy free, toxic free, fire safety, viscoelastics

ACOURETE NOISE ARMOUR



HOME THEATER TAMAN RATU


Acourete Noise Armour and
Acourete Fiber



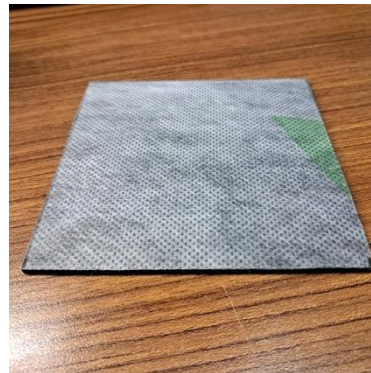
MEETING ROOM DBS

Acourete Noise Armour

More

A modern meeting room with a large conference table, grey chairs, and a large window with a city view. A person is sitting at the table with their arm raised. The room features Acourete Noise Armour on the walls and ceiling. The word "More" is visible on the wall.

ACOURETE SILENT WALL

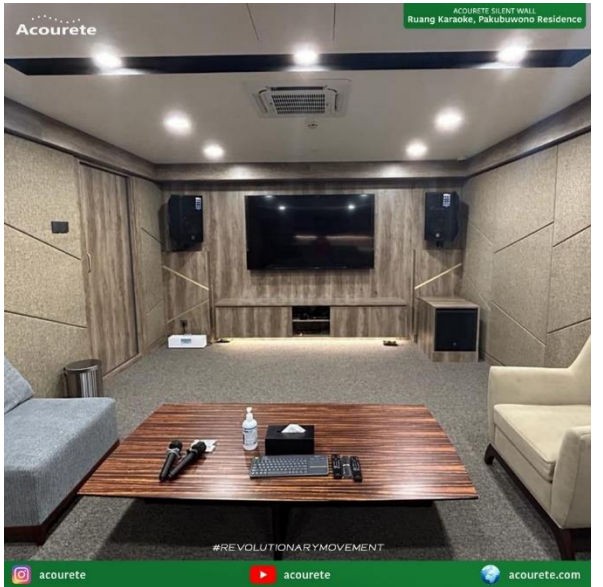
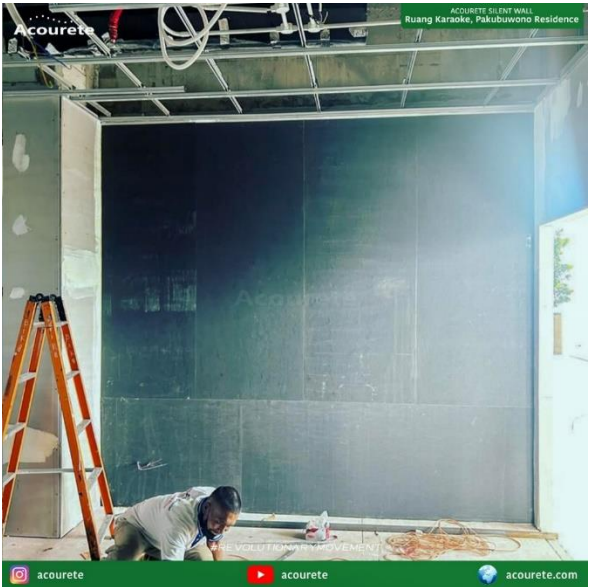
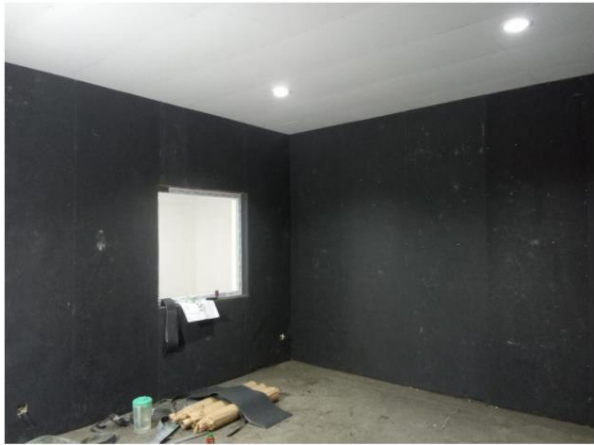
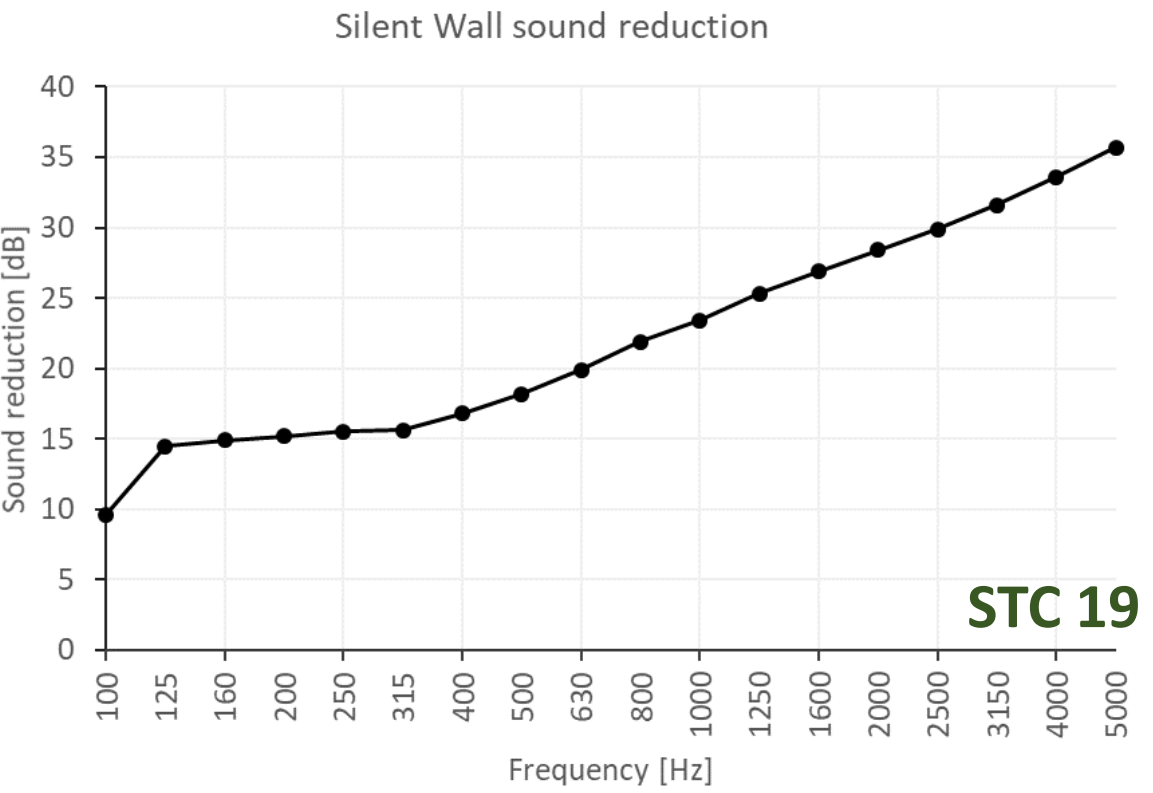


Allergy free, toxic free, fire resistant, viscoelastics

Description	Value
Type	Acoustics Vibration Insulation
Dimension	4.880mm x 810mm x 2mm
Material	PVC
Mass	15 kg
Density	1.750 kg/m ³
STC	19
Colour	Black
Country of Origin	Japan

Broadcast studio, Music recording, Home theater, Karaoke room, Auditorium, Music hall, Discotheque, Office, Machine room

ACOURETE SILENT WALL





**ACOURETE SILENT WALL
at Podcast Room #1 ceiling,
NOICE**



ACOURETE FIBER



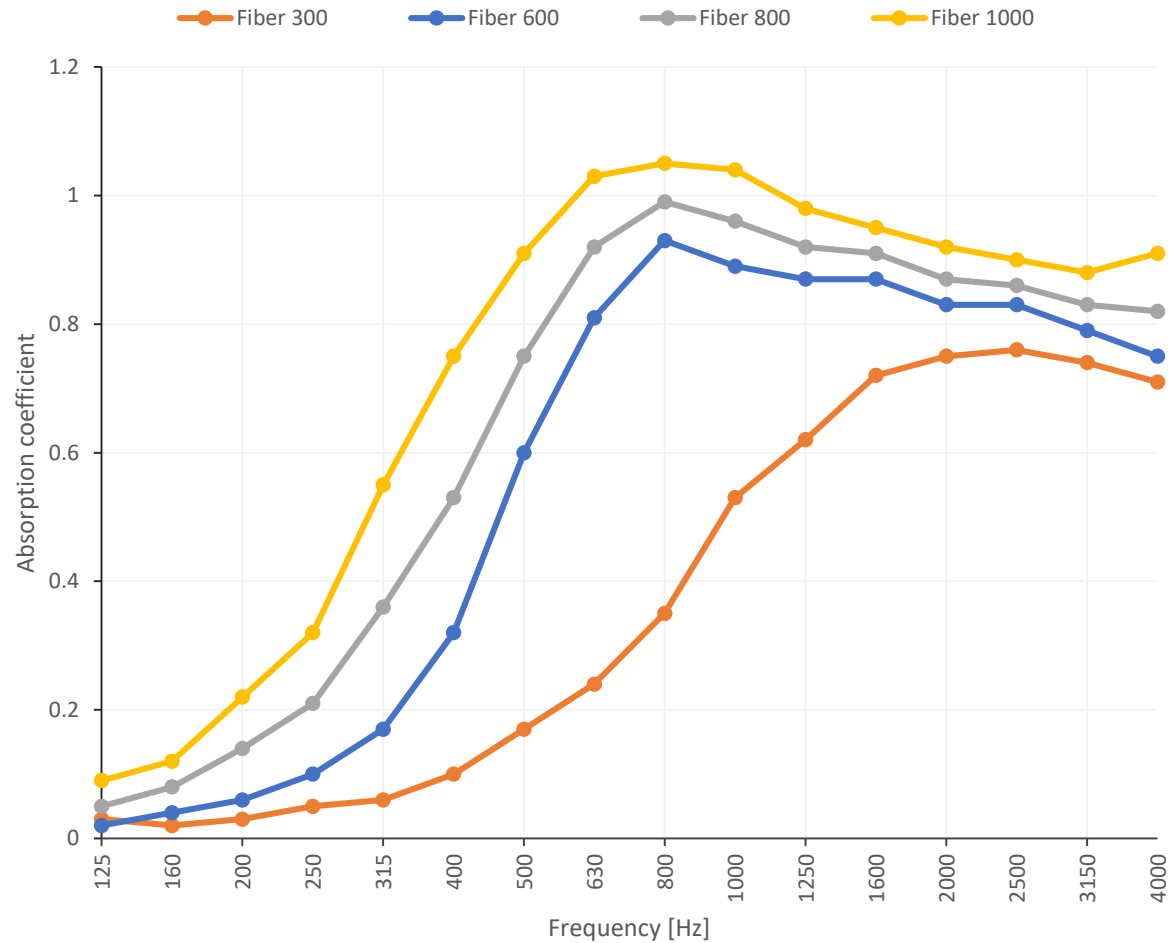
Allergy free, toxic free, fire resistant

Description	Value
Type	Acoustics Absorbing Material
Dimension	Fiber 300 = 1000mm x 1500mm x 3mm Fiber 600 = 1000mm x 1500mm x 6mm Fiber 800 = 1000mm x 1500mm x 8mm Fiber 1000 = 1000mm x 1500mm x 10mm
Material	Polypropylene
Weight	Fiber 300 = 0.45 kg Fiber 600 = 0.9 kg Fiber 800 = 1.5 kg Fiber 1000 = 2.25 kg
NRC	Fiber 300 = 0.375 Fiber 600 = 0.63 Fiber 800 = 0.69 Fiber 1000 = 0.8
Density	Fiber 300 : 100 kg/m ³ , Fiber 600 : 100 kg/m ³ Fiber 800 : 125 kg/m ³ , Fiber 1000 : 150 kg/m ³
Colour	White
Country of Origin	Korea

Hall, Home theater, Karaoke room, Music lounge, Office, Hospital, Hotel

ACOURETE FIBER

Acourete Fiber Sound Absorption Coefficient



A photograph of a modern podcast room. The room features dark grey acoustic panels on the walls and ceiling. A wooden door with a vertical window and a black handle is visible on the right. A light-colored wooden table and a wicker chair are in the foreground. A window on the left shows a view of the outdoors at night. A white air conditioner is mounted on the wall. The ceiling has recessed lighting. A green text box is overlaid on the left side of the image.

**ACOURETE FIBER
at Podcast Room #4 ceiling, NOICE**

ACOURETE PAINT EZ1



Allergy free, toxic free, fire resistant

Description		Remarks
Type		Acoustics Vibration Insulation
Volume		1 litre
Viscosity (cps)		215 (no spindle 4 60rpm)
Loss Factor		0.15-0.23
Colour		Black, Water soluble damping paint
Density	Before Dry	1.3kg/m ³
	After Dry	1.6kg/m ³
Solid content (%)		70
Surface drying time		Over 3 hours
Complete drying time		Over 24 hours
Water resistant (After dry)		Good
Application Method		Brush, spray, roller
Country of Origin		Korea
Acourete Co.Ltd		

Transportation, Metal sheet

ACOURETE REGUPOL SONUS MULTI 3

(formerly Regupol 4515)



Allergy free, toxic free, cradle to cradle certified, easy to use

Description	Value
Type	Vibration Damping
Dimension	1000mm x 1000mm x 3 mm
Material	PUR - Foam and Cork Elastomer
Weight	2,1 kg /m ²
Colour	Brown
Rolls	20.000 mm x 1.000 mm
Country of Origin	Germany
Production and Certification	OHAS 18001 : 2007 , DIN ISO 9001 : 2008, DIN ISO 14001 : 2004 Managemen Sistem

Hotel, Office, Hospital, Home theater, Music studio, Karaoke room, Gym

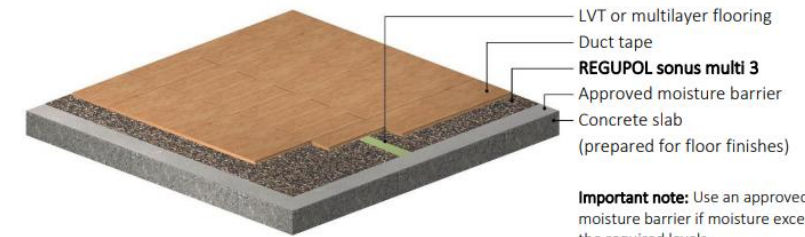
ACOURETE REGUPOL SONUS MULTI 3

Acoustical Performance*	Standard	Result	Comment
Under vinyl planks:			
4.5 mm LVT vinyl planks, REGUPOL sonus multi 3 , 150 mm concrete slab	AS ISO 717.2-2004 ISO 140-8: 2006 (E) ISO 140-6-2006 ASTM E989-89	ΔL_w 18 dB $L_{n,w}$ 59 dB IIC 51	Test report RG084 - INR210-04-01
4.5 mm LVT vinyl planks (non-bonded), REGUPOL sonus multi 3 (non-bonded), 150 mm concrete slab	AS ISO 717.2-2004 ISO 140-8: 2006 (E) ISO 140-6-2006 ASTM E989-89	ΔL_w 19 dB $L_{n,w}$ 58 dB IIC 52	Test report RG081 – INR210-01-01
2 mm vinyl planks, REGUPOL sonus multi 3 , 150 mm concrete slab	AS ISO 717.2-2004 ISO 140-8: 1997 (E) ISO 140-6 ASTM E989-89	ΔL_w 18 dB $L_{n,w}$ 58 dB IIC 52	Test report RG019 - INR153 Test Floor (a)
Under sheet vinyl:			
2 mm sheet vinyl, REGUPOL sonus multi 3 , 150 mm concrete slab	AS ISO 717.2-2004 ISO 140-8: 2006 (E) ISO 140-6-2006 ASTM E989-89	ΔL_w 17 dB $L_{n,w}$ 61 dB IIC 49	Test report RG082 – INR210-08-02

*Assembly from top to bottom

Floor assembly example

Non-bonded LVT or multilayer modular flooring



Important note: Use an approved moisture barrier if moisture exceeds the required levels.





ACOURETE REGUFOAM 150



Allergy free, toxic free, low natural frequency

Description	Value
Type	Vibration Damping Foam
Dimension	1000mm x 1500mm x 12mm
Material	Cellular Polyurethane
Weight	+/- 2.5 kg/m
Density	150 kg/m ³
Colour	Beige
Country of Origin	Germany

Broadcast studio, Home theater, Karaoke room, Music hall, Discotheque, Railroads, Machines, Building foundation

ACOURETE REGUFOAM 150

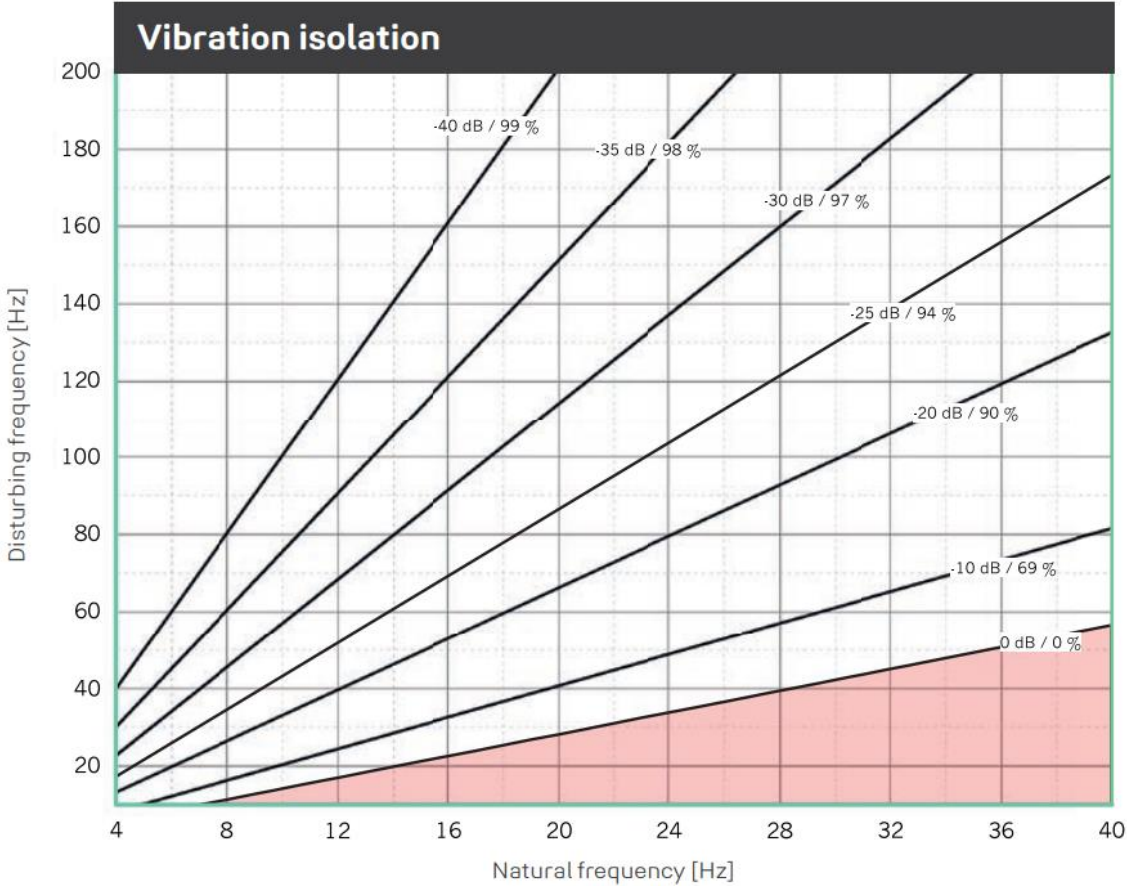


Illustration of the isolation efficiency of a single-degree-of-freedom system (SDOF system) on a rigid base with **REGUFOAM vibration 150plus**. Parameter: power transmission (insertion loss) in dB, isolation factor in %.



ACOURETE REGUPOL SOUND 12



Description	Value
Type	Vibration Damping
Dimension	1.200 mm x 1.000 mm x 17 mm
Material	PU bonded elastomers
Permanent Static Load	3000 kg /m2
Colour	Brown-beige, dark particles Upper side laminated with green aluminum foil
Fire Behavior	B2 (DIN4102)
Country of Origin	Germany

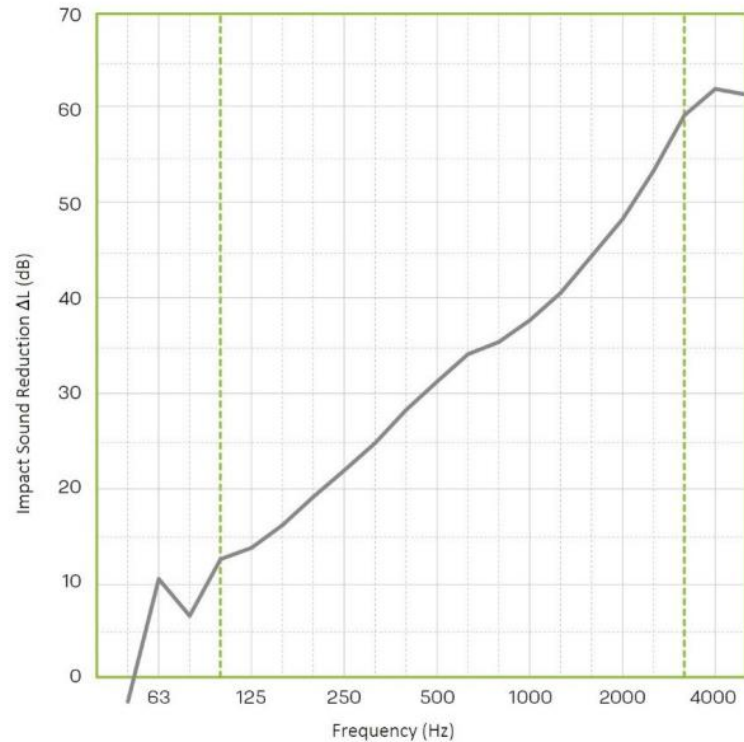
Hotel, Office, Hospital, Home theater, Music studio, Karaoke room, Gym

Long-lasting, cradle to cradle certified

ACOURETE REGUPOL SOUND 12

Detailed test results for impact sound reduction

Test report PB 4.2/14-154-2



Assembly

90 mm Cement screed

CT-C25-F4, 160 kg/m²

17 mm REGUPOL sound 12

140 mm Concrete Slab

Test room size

4.86 x 5.06 m = 24.60 m²

Publication of test results by MFPA

Leipzig GmbH.

The full test report PB4.2/14-154-2 dtd.

17/07/2014 is available upon request.



ACOURETE REGUPOL VIBRATION 300



*Low natural frequency, long-lasting,
cradle to cradle certified*

Description	Value
Material	Rubber, Fibres, Styrene-butadiene rubber (SBR), Nitrile butadiene rubber (NBR) Polyurethane
Loss factor	0.18
Compression Set	4.1 %
Elongation at Break	60%
Fire Behaviour	B2 (DIN4102)
Dimension	1000mm x 1250mm x 17mm
Colour	Black
Permanent Static Load	5.000kg/m ²
Country of Origin	Germany

*Factory machine, Generator, Hotel, Apartment,
Office, Public transportation, Railway, Trailer truck,
Subway, Chiller machine*

ACOURETE REGUPOL VIBRATION 300

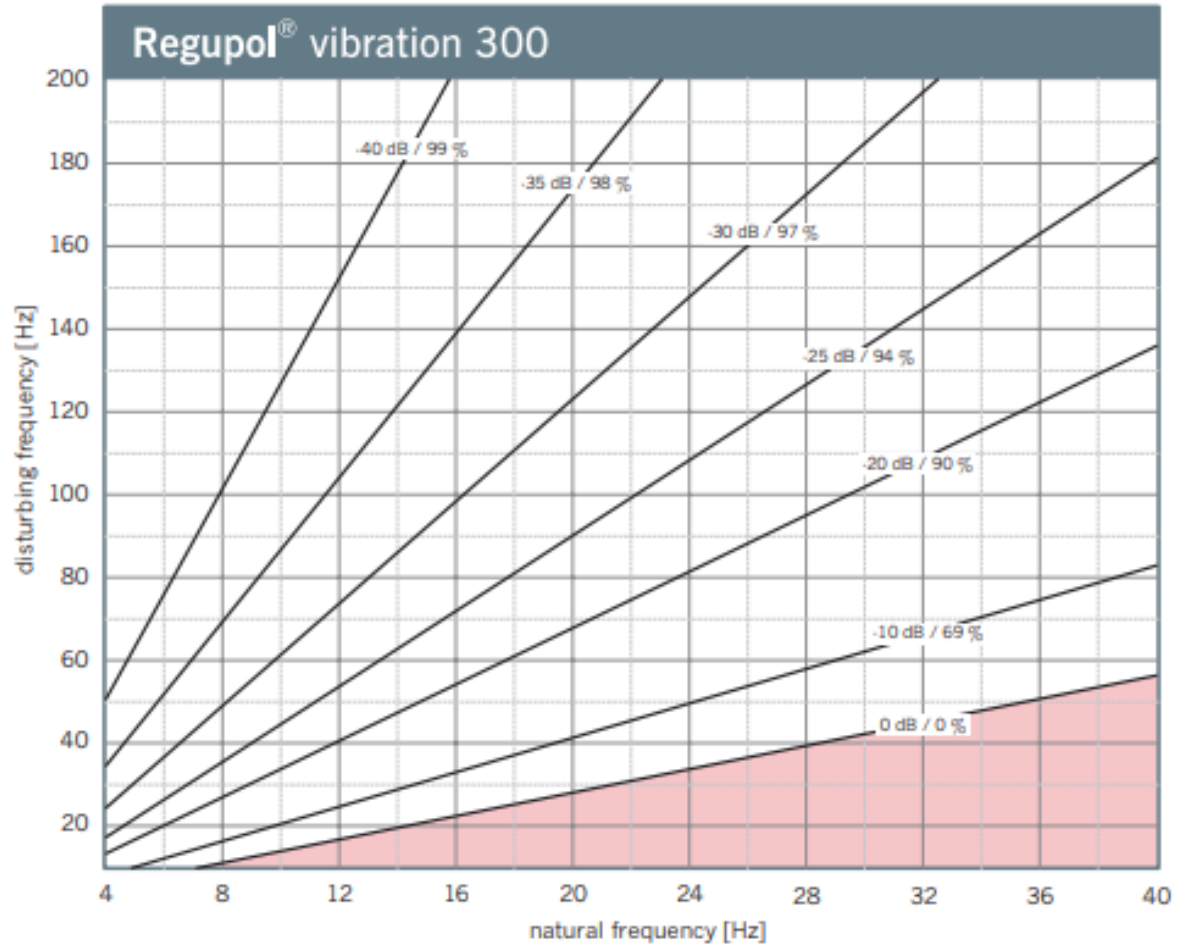


Illustration of the isolation efficiency of a single-degree-of-freedom system (SDOF system) on a rigid base with **Regupol® vibration 300**. Parameter: power transmission (insertion loss) in dB, isolation factor in %.



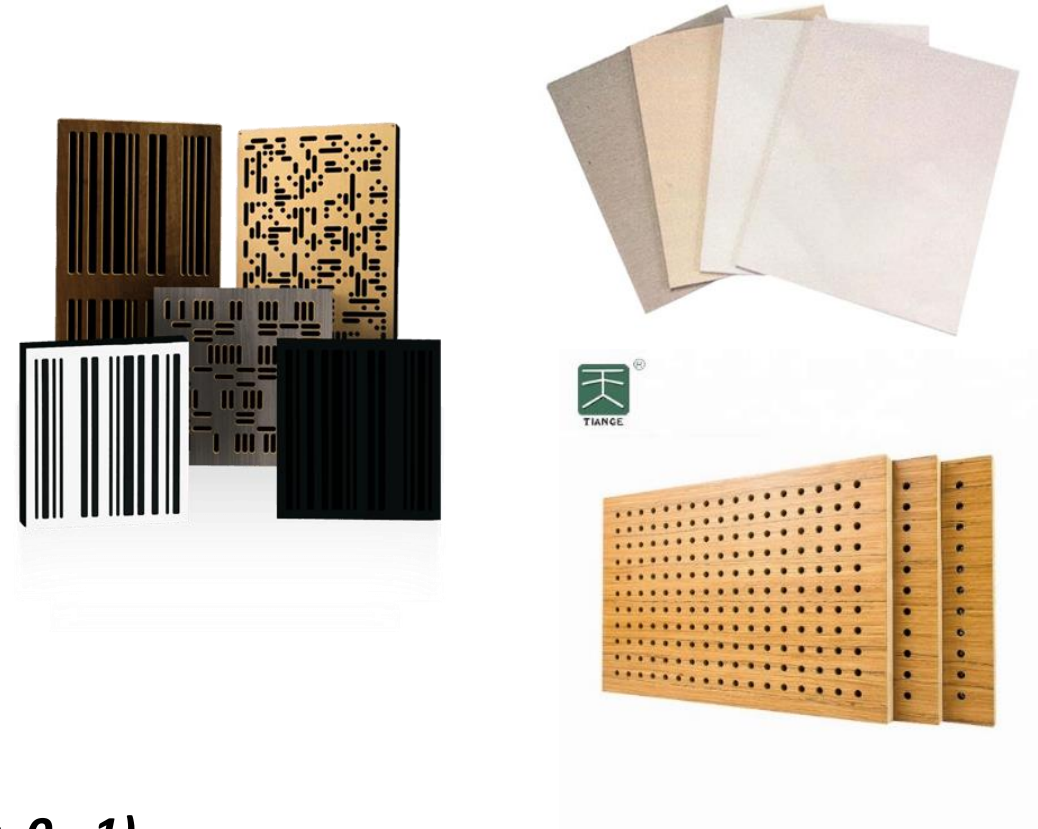
Material Akustik Arsitektur – Mengurangi Gema

Karakteristik material

Low density

Low mass

Porous



Performa dilihat dari NRC (Noise Reduction Coefficient, 0 - 1)



Before Treatment

Suara Ucap	Choir	Musik



After Treatment

Suara Ucap	Choir	Musik

ACOURETE FIBER



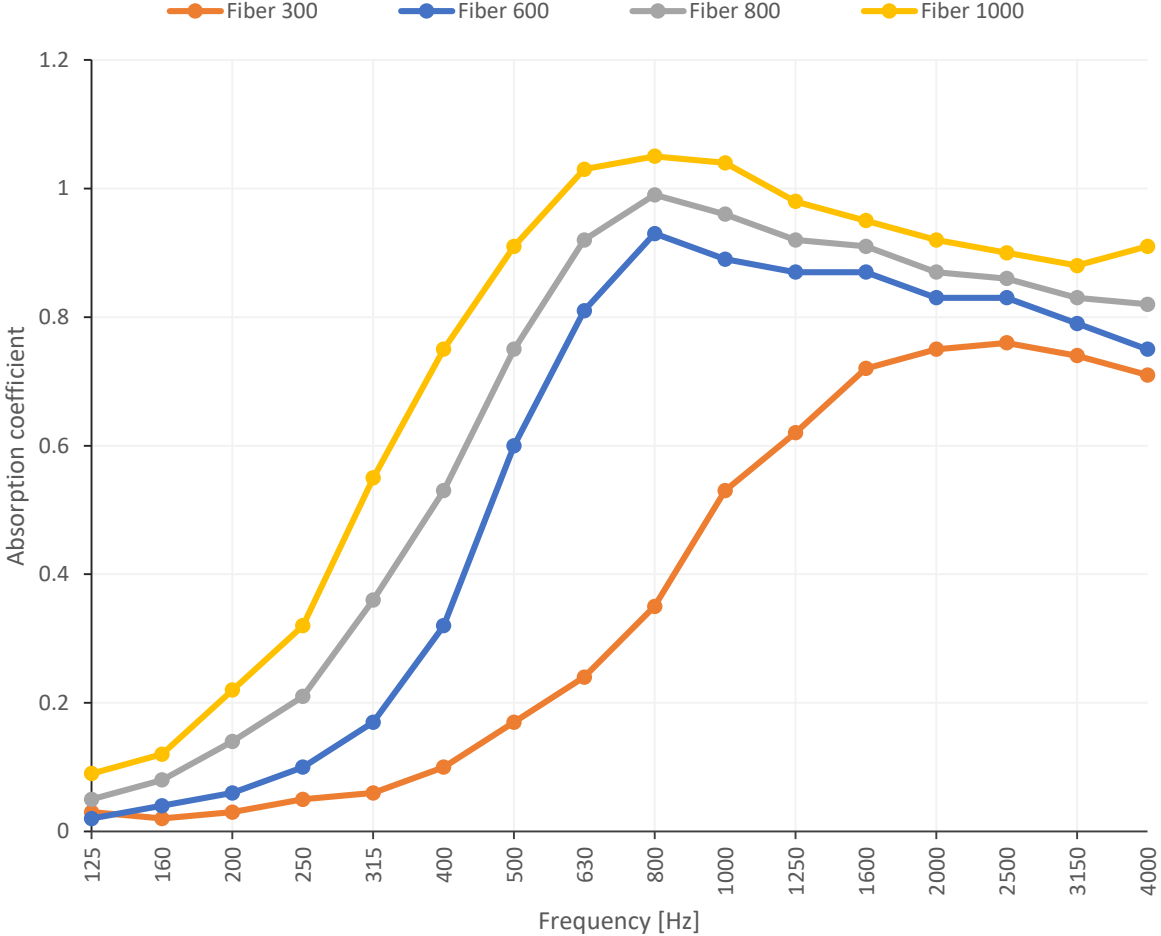
Allergy free, toxic free, fire resistant

Description	Value
Type	Acoustics Absorbing Material
Dimension	Fiber 300 = 1000mm x 1500mm x 3mm Fiber 600 = 1000mm x 1500mm x 6mm Fiber 800 = 1000mm x 1500mm x 8mm Fiber 1000 = 1000mm x 1500mm x 10mm
Material	Polypropylene
Weight	Fiber 300 = 0.45 kg Fiber 600 = 0.9 kg Fiber 800 = 1.5 kg Fiber 1000 = 2.25 kg
NRC	Fiber 300 = 0.375 Fiber 600 = 0.63 Fiber 800 = 0.69 Fiber 1000 = 0.8
Density	Fiber 300 : 100 kg/m ³ , Fiber 600 : 100 kg/m ³ Fiber 800 : 125 kg/m ³ , Fiber 1000 : 150 kg/m ³
Colour	White
Country of Origin	Korea

Hall, Home theater, Karaoke room, Music lounge, Office, Hospital, Hotel

ACOURETE FIBER

Acourete Fiber Sound Absorption Coefficient



A music studio with three guitars (green, yellow, and sunburst) mounted on a wall of acoustic panels. A man in a blue shirt is seated at a desk with recording equipment, including a laptop and a rack of gear. Two microphones on stands are positioned in the foreground. A black leather sofa is visible in the background. An air conditioner is mounted on the wall above the guitars.

ACOURETE FIBER
at Jatinegara Music Studio



ACOURETE FIBER
at Audiophile Room, Sindanglaya



ACOURETE FIBER
at Family Home Theatre, HALLING

PPM MEETING ROOM

Acourete Fiber



ACOURETE BOARD 230



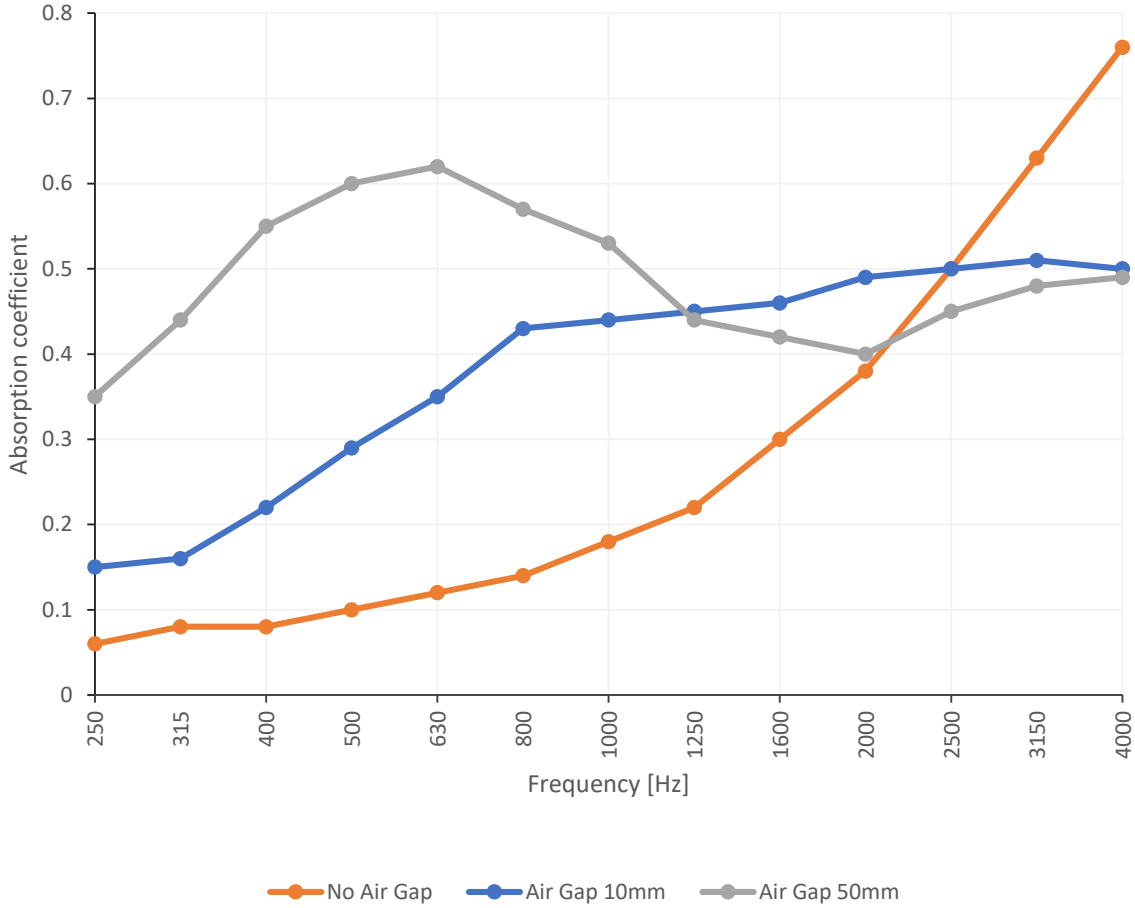
Allergy free, toxic free

Description	Value
Type	Acoustics Board Ceiling Wall
Dimension	1200mm x 600mm x 9mm
Material	Polyester
Density	230 g/m ³
Weight	1.5 kg
NRC	0.47
Colour	White
Country of Origin	Korea

Hall, Home theater, Karaoke room, Music lounge, Office, Hospital, Hotel

ACOURETE BOARD 230

Acourete Board Sound Absorption Coefficient





DIAMOND GOLF HOUSE

Acourete Board

**ACOURETE BOARD 230
at Music Room, Koopsudnas HALIM**



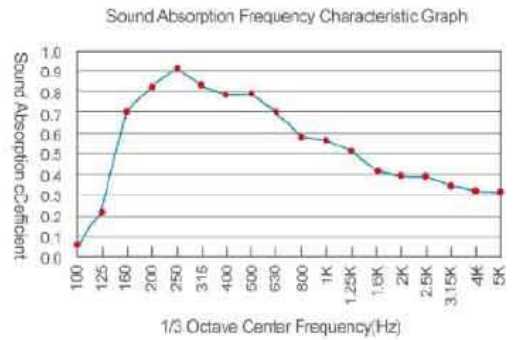
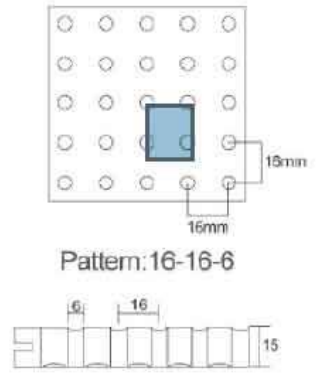
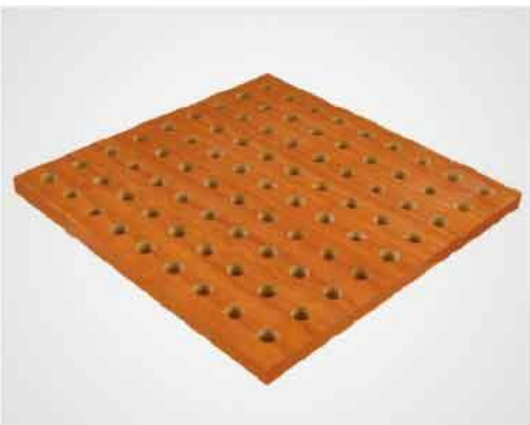
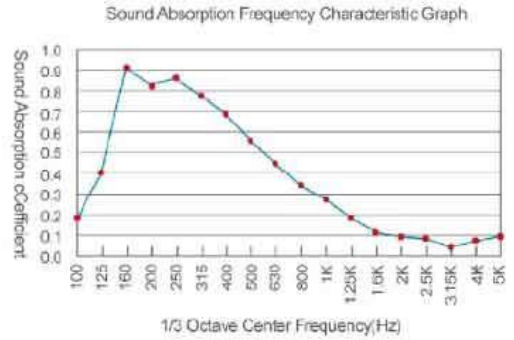
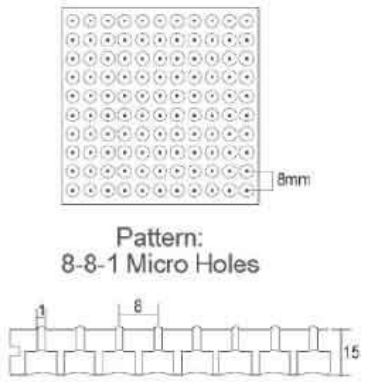
ACOURETE PERFOWOOD



*Hall, Home theater, Karaoke room,
Music lounge, Auditorium, Worship
house*


Description	Value
Surface Density	8.5 kg/m ³
Material	MDF
Front Finish	Melamine
Back Finish	Unfinish + Acoustics Felt
Length	1200mm / 600mm
Width	600mm
Thickness	12mm
Fire Rating	No
Eco Friendly	No
Color	See Color Table
NRC Perfowood 881	0.44
NRC Perfowood 16166	0.66
Country of Origin	China

ACOURETE PERFWOOD





ACOURETE PERWOOD
at Keuskupan Agung, Palangkaraya

The image shows the interior of the Papillon Restaurant. On the left, a long wall is covered in a light-colored wood with a grid of small, dark circular perforations. Below this wall is a long, dark bar with a blue LED light strip running along its edge. The bar is illuminated from below, creating a soft glow. In the background, the restaurant's dining area is visible, featuring round tables and chairs. The lighting is dim and atmospheric, with blue accents from the bar and some warm lights in the distance. The overall mood is modern and sophisticated.

ACOURETE PERWOOD
at Papillon Restaurant



MULTIFUNCTION HALL PENDOPO RANTAU

Acourete Perfowood



AUDITORIUM PLAZA MANDIRI

Acourete Perfowood

A wide-angle, low-angle shot of a grand, ornate auditorium. The ceiling is high and features a grid of recessed, illuminated panels. A large, multi-tiered chandelier hangs from the center. The walls are white with classical architectural details, including columns and decorative moldings. The stage is dark and occupies the lower half of the frame. The overall atmosphere is formal and elegant.

ACOURETE PERWOOD
at Auditorium Plaza Mandiri

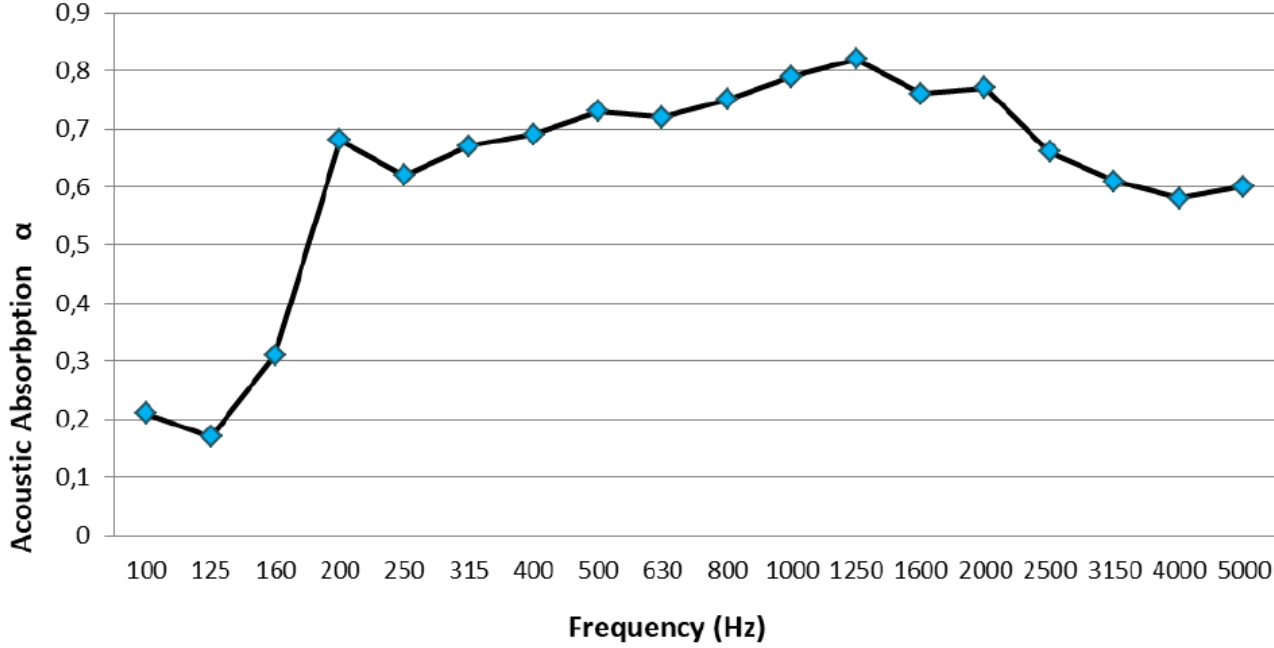
ACOURETE DIATHONITE ACOUSTIX+



Description	Value
NRC	15mm : 0.47 20mm : 0.54 30mm : 0.58 40mm : 0.66
Density	470 kg/m ³
Water Absorption	0.35 kg/m ² h ^{0.5} (category W2)
Adhesion	0.258 N/mm ² - FP:C
Fire resistance	Class A1
Thermal Conductivity	0,083 W/mK
Breathability (μ)	4
Mechanical Resistance	3 N/mm ²
Country of Origin	Italy

Hall, Home theater, Karaoke room, Music lounge, Auditorium, Worship house

ACOURETE DIATHONITE ACOUSTIX+



**for 3 cm thickness*





**ACOURETE DIATHONITE ACOUSTIX
at Mahabodhi School**

Material Akustik Arsitektur Lainnya (*treatment khusus*)



Corner basstrap



Diffuser QRD 1D



Diffuser QRD 2D

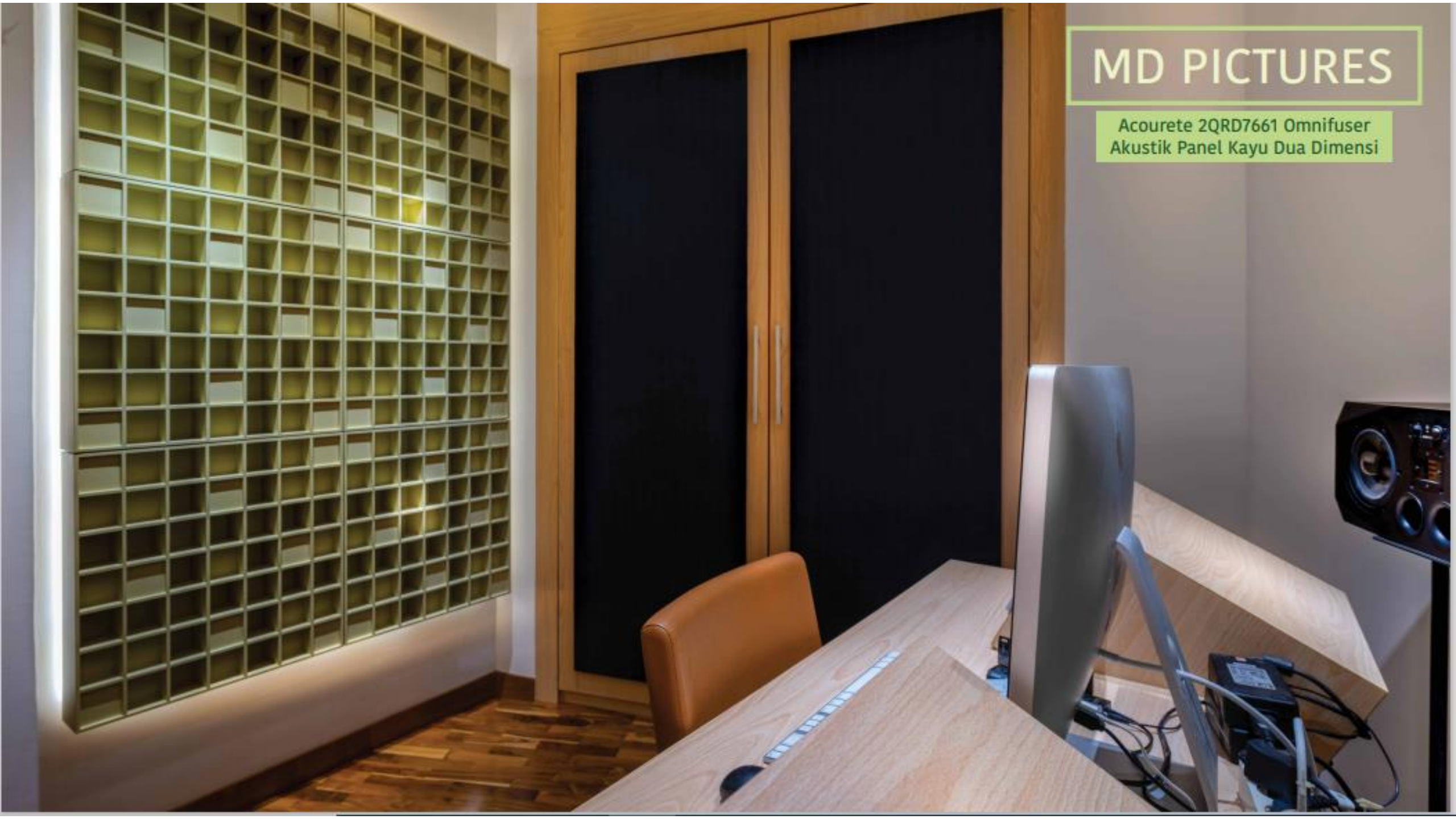


AUDITORIUM AVI CC

Acourete 2QRD7661 Omnifuser
Akustik Panel Kau Dua Dimensi

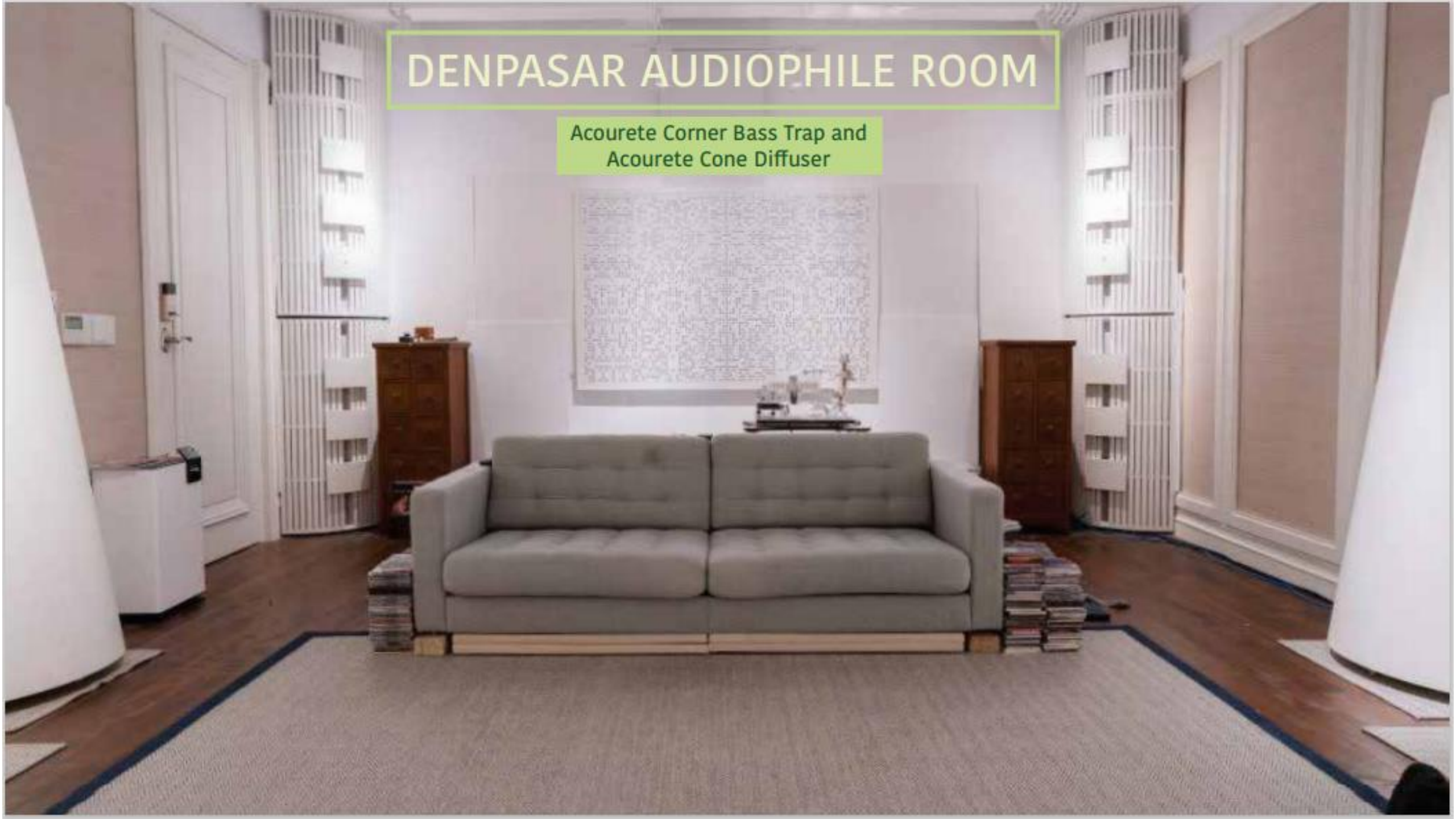
MD PICTURES

Acourete 2QRD7661 Omnifuser
Akustik Panel Kayu Dua Dimensi



DENPASAR AUDIOPHILE ROOM

Acourete Corner Bass Trap and
Acourete Cone Diffuser





**ACOURETE DIFFUSER QRD 2D
at Mini Home Theatre, HALLING**

The image shows a wall of acoustic diffusers in a home theatre. The wall is composed of several vertical panels. The outer panels feature a geometric pattern of triangles in light beige, dark brown, and wood-grain finishes. The inner panels are solid wood-grain. Vertical LED light strips are installed between the panels, casting a warm glow. A small black speaker is mounted on the left side of the wall. A red leather chair is partially visible in the bottom left corner. The ceiling is dark blue with recessed lighting.

ACOURETE DIFFUSER QRD 1D
at Family Home Theatre, HALLING



Photo by Manuel Nägeli on Unsplash



Moynihan Train Hall - Wikipedia



<https://www.cnnindonesia.com/nasional/20150528104223-20-56223/sosialisasi-bpjs-kesehatan-di-sulawesi-terhambat>



bit.ly/AcoureteGoestoCampus6





Terima Kasih