Acourete GoestoCampus #8

itenas

Material Akustik Peredam Suara dan Aplikasinya pada Beberapa Jenis Ruangan

R. ARIEF YUDISTIRA
Head Sales at Acourete

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Acoustic Product Consultant at Acourete

RETNO AJENG PRATIWI
Acoustic Product Consultant at Acourete

MANFAAT

- Wawasan baru
- *E-Certificate*

FREE

Link Pendaftaran:
https://bit.ly/RegistrasiAGC8

Ruang Audio Visual Teknik Sipil ITENAS

Jumat, 19 April 2024 (09.00 - 11.30 WIB)

OFFLINE

Wajib registrasi paling lambat
Rabu, 18 April 2024 pukul 16.00 WIB
untuk pembuatan daftar hadir

PESERTA

Mahasiswa/i Program Studi Arsitektur
(Wajib mengisi ulang daftar hadir di ruang presentasi)

#MenujuSuaraBaik

Outline.

Acourete & Acoustic.

- *Acourete Company Profile*
- *Acoustic*
- *Sound behavior and its problem*

3 main acoustic things to consider.

- *Background Noise*
- *Sound Insulation*
- *Room Acoustic*

Acoustic materials.

- *Type of acoustic materials*
- *Insulation Material*
- *Room Acoustic Material (Absorber & Diffuser)*

Acourete itenas

#MENUJUSUARABAIK

WWW.ACOURETE.COM

ABOUT
OUR 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

Architectural Acoustics

Noise Control Around The Room

Acoustics for Industrial

Industrial Machinery Noise Control and Around The Room

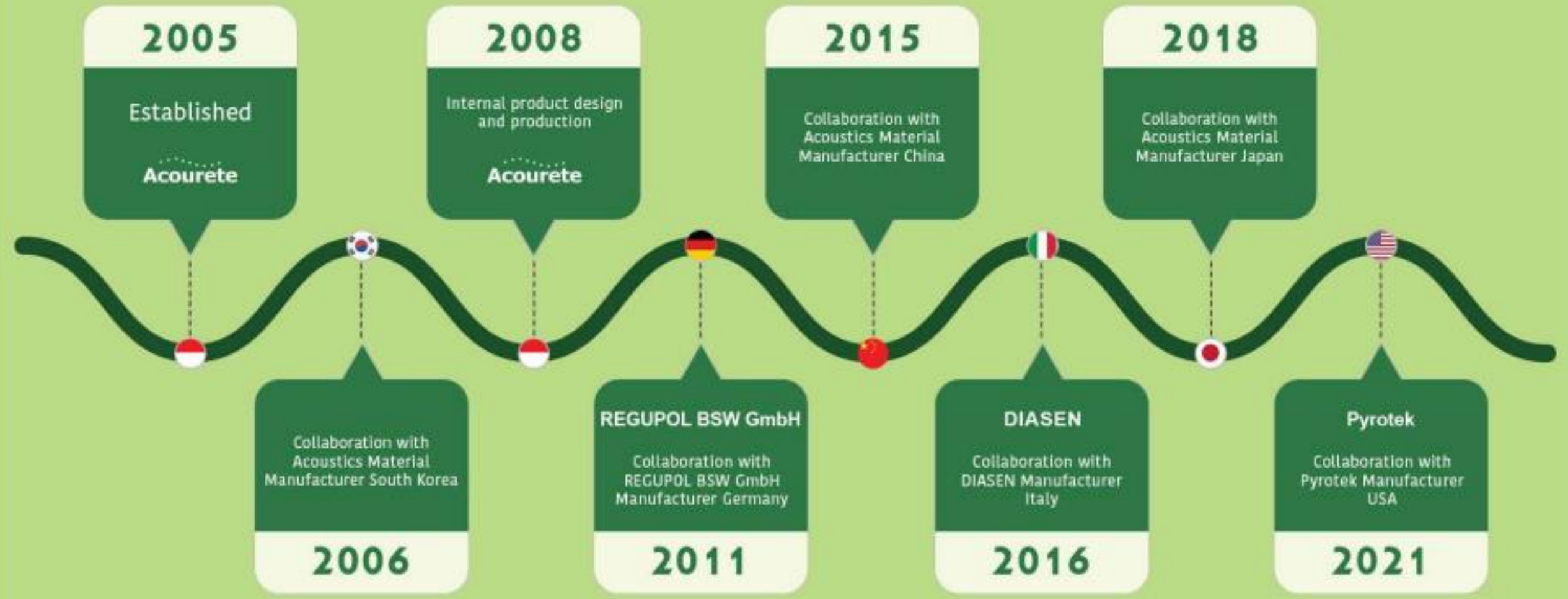
Building Acoustics

Noise control from Around The Building or 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

BTB School Jakarta, Indonesia
1927 AMDG
Universitas Pendidikan Indonesia
Institut Pertanian Bogor
Monash University
Kino PT. Kino Indonesia Tbk.
Mondelēz
NOKIA
DBS
JW Marriott Jakarta
Shangri-La Hotels and Resorts
potato head
md entertainment
Bali United
RANS Entertainment
PT. Dwibina Prima Contractor & Developer
Pratama Solusi Gemilang
pedima
G-G-S interiors, manufacturing & MEP
VIVERE group
BMKK
TGA Tirtajaya Gemilang Abadi
MYSTUDIO CORP.
HKBP Petojo Resort Petojo Jakarta
IDX Indonesia Stock Exchange Bursa Efek Indonesia
WIKA PT Wijaya Karya (Persero) Tbk.
PT Freeport Indonesia
mandiri
Kementerian Pertahanan Republik Indonesia
Keluarga Besar Istana Presiden RI

Acoustics.

Acourete

Acoustics

Acoustics is the science that deals with the production, control, transmission, reception, and effects of sound (as defined by Merriam-Webster).

Sound is a vibration that propagates as an acoustic wave through a transmission medium such as a gas, liquid or solid.

Acourete itenas

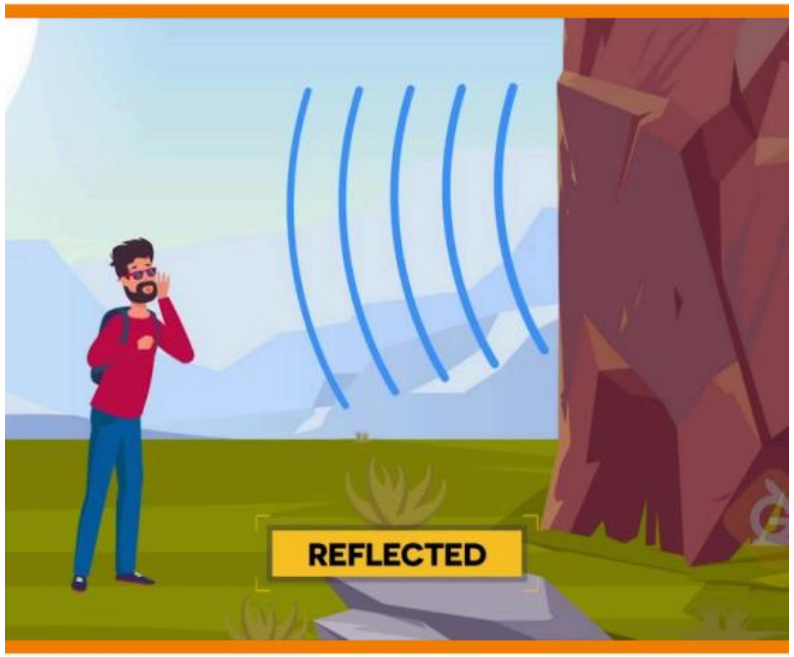
2 types of acoustics in an architectural building…

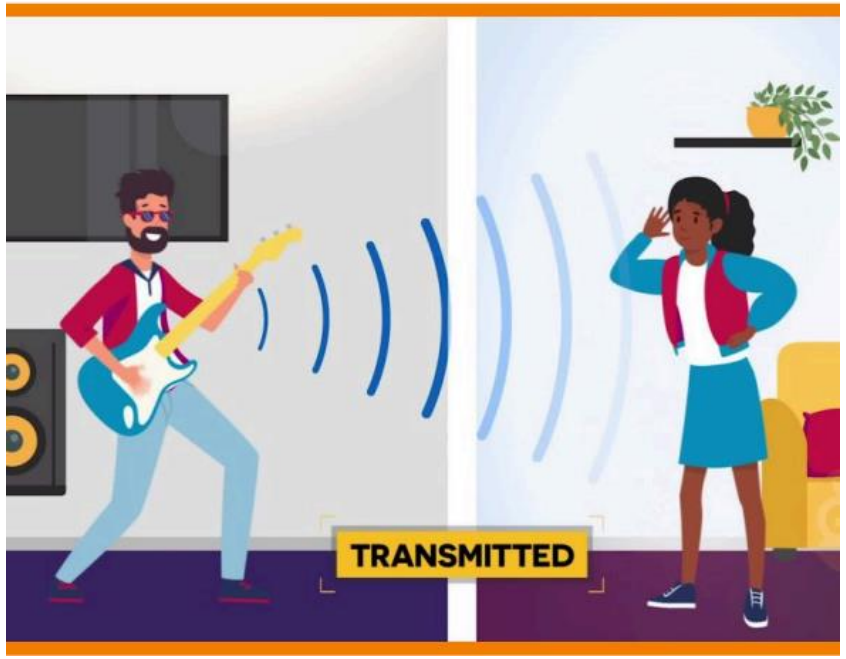
Building acoustics – sound insulation and sound proofing. How sound transmitted and **transferred** through partitions

Architectural acoustics – room acoustics. How sound bounced around **within** space and reflected on the surfaces.

Photo by Manuel Nägeli on Unsplash

Sound can be reflected, transmitted, and absorbed





https://www.generationgenius.com/wp-content/uploads/reading-material/wave-reflection-absorption-transmittance-reading-material-grades-6-8.pdf

Sound behaves differently according on the *surfaces* and their *frequency* characteristics.

Sound creates unforgettable memories,
reminds you to a beautiful place,
someone you cherises,
but also creates many problems!

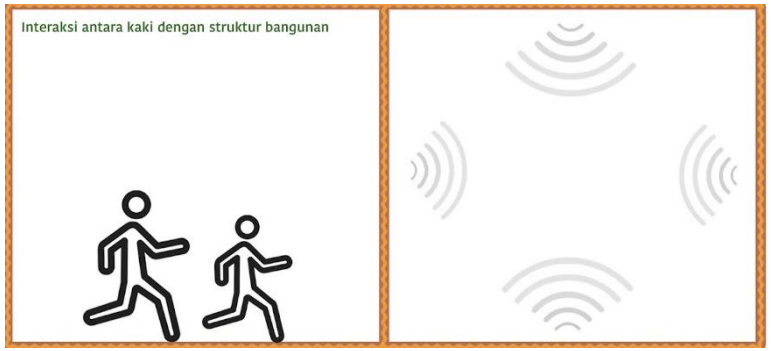
Sound behavior and its problem.

Sound behavior and its problems

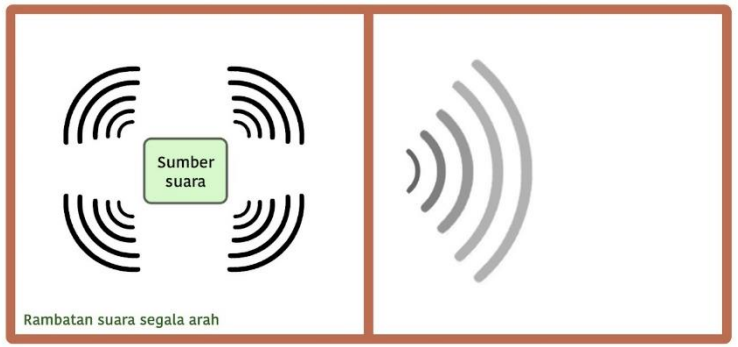
NOISY SPACE & ENVIRONMENTS!

THIS IS CALLED NOISE

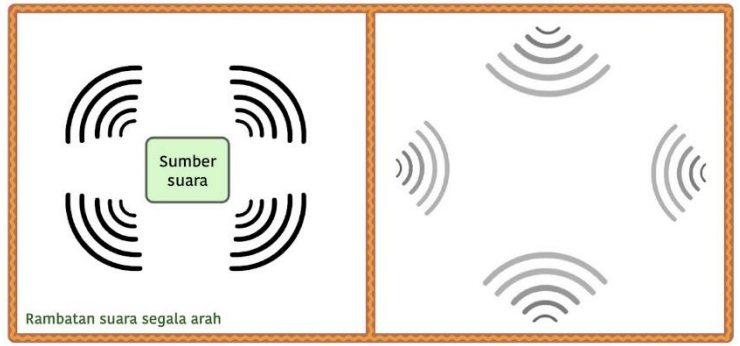
THE NOISES…



Impact Noise



Air-borne Noise



Structure-borne Noise

We need SOUND INSULATION STRATEGIES to mitigate the noises

Sound behavior and its problems

TOO MUCH REVERBS, ECHOES, AND NOT SO CLEAR SPEECH

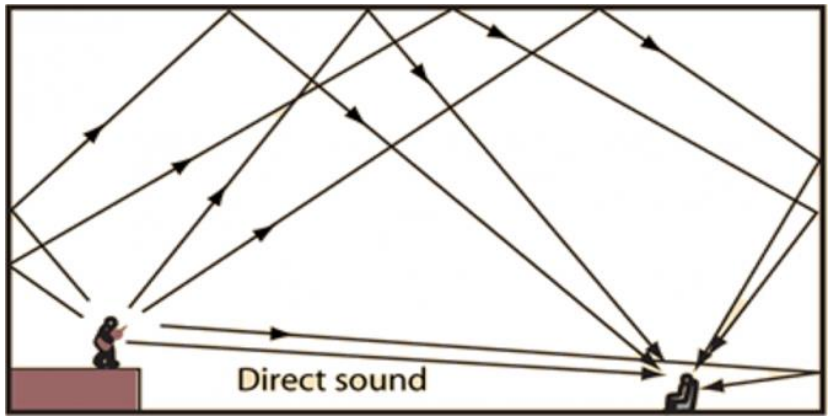
Credit: Yana M.

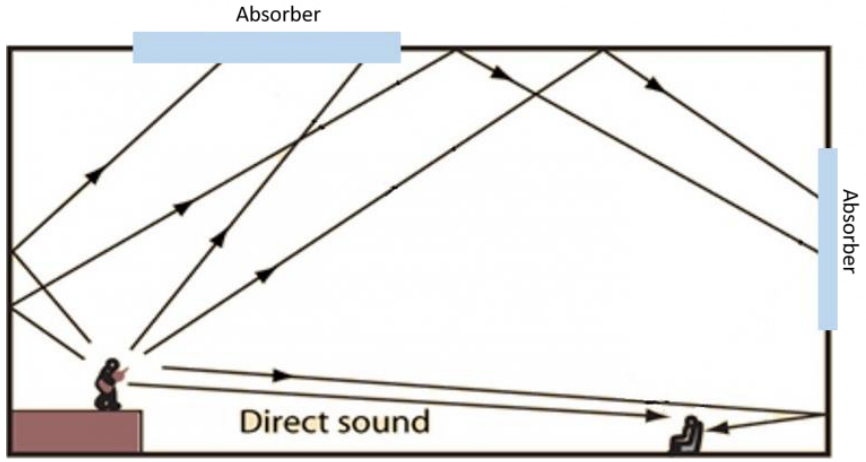

Credit: Envato.com

THIS IS CALLED ROOM ACOUSTICAL DEFECT

THE ACOUSTICAL DEFECTS…

- Didominasi material reflektor
- Bentuk ruangan
- Peletakkan pengeras suara (speaker)





We need ROOM ACOUSTIC TREATMENTS to mitigate the acoustical defects

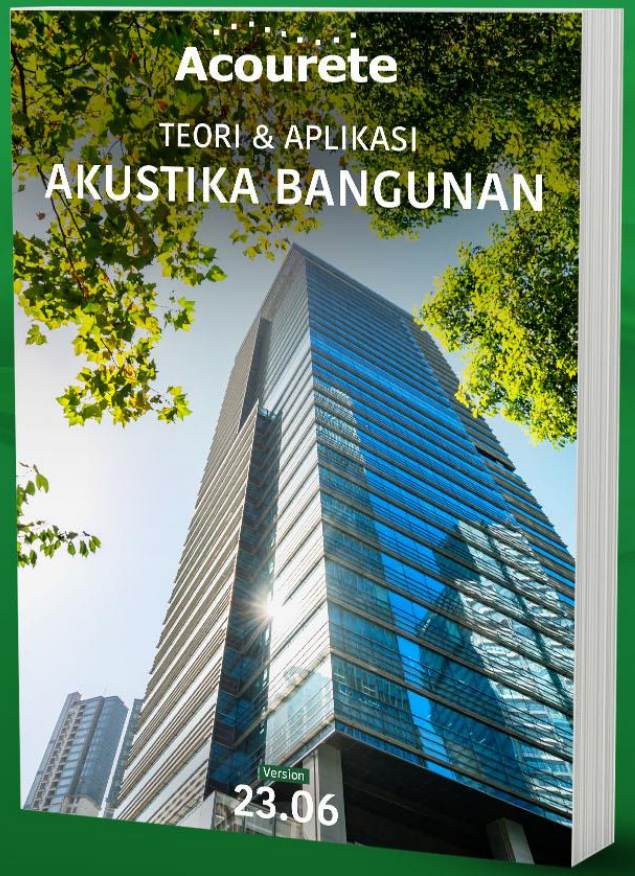
Acourete OnlineCourse

#MenujuSuaraBaik

Teori dan Penerapan AKUSTIKA BANGUNAN

Kursus Online Keprofesian Akustik

By Acourete

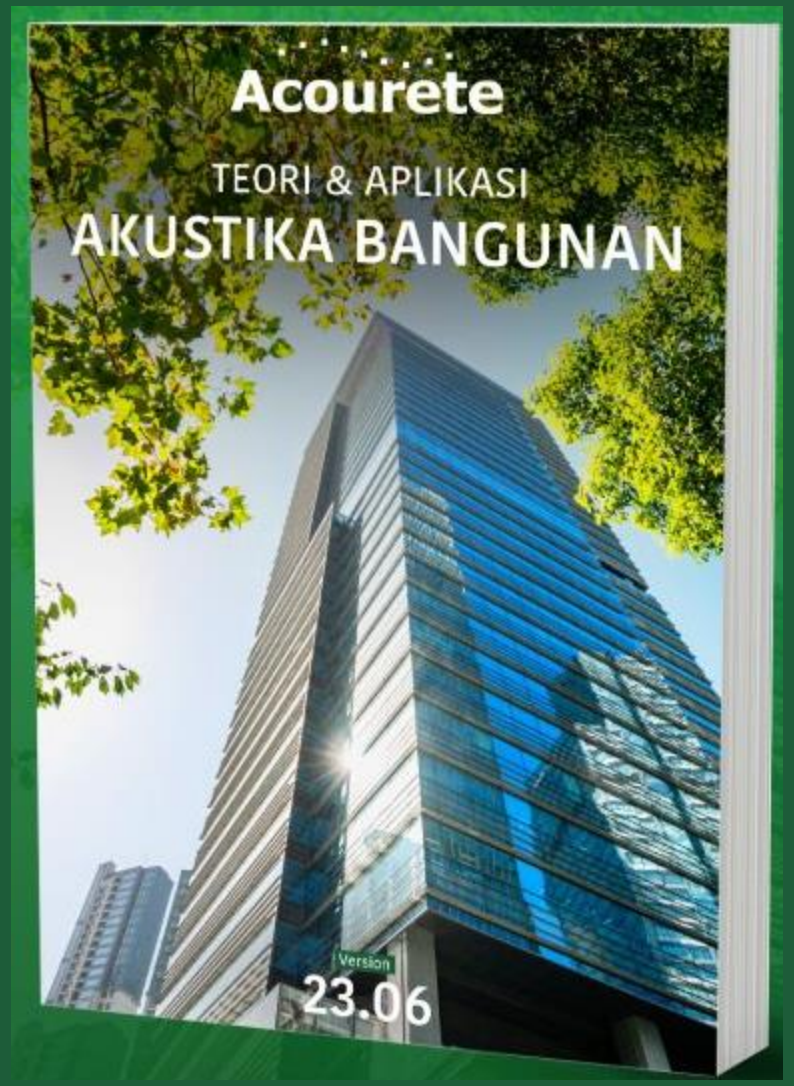


Online course by

Acourete

Based on e-book →

📚 Download ebook "Teori & Aplikasi Akustika Bangunan" di **https://acourete.com/buku-akustika-bangunan-lengkap/**



Keprofesian Akustik - Teori dan Penerapan Akustika Bangunan

4.0 ★★★★★ (2 Rating) 16 Peserta telah mengikuti pelatihan ini

Sertifikat

Ringkasan | Tanya Jawab | Ulasan (1)

Deskripsi

3 Manfaat Kursus
- Kursus ini membantu mengembangkan karir Anda sebagai Aplikator Profesional Akustik.
- Kursus ini membantu Anda memberikan nilai tambah Desain Akustika Bangunan yang Praktis tapi Tepat Sasaran.
- Kursus ini memberikan wawasan, teori Akustika Bangunan sampai dengan penerapannya.

Deskripsi:
Kursus online ini berisi materi teori dan penerapan Akustika Bangunan. Kursus ini dibawakan dengan bahasa yang mudah dipahami tanpa mengurangi keutuhan teori, agar materi kursus dapat dipahami dengan baik oleh setiap peserta kursus dengan latar belakang yang berbeda.

Kursus online ini sangat berguna bagi kalian yang berprofesi sebagai:
1. **Konsultan perencana** atau **kontraktor** yang ingin mempelajari teori dan aplikasi akustika bangunan secara cepat dan tepat guna.
2. **Arsitek** yang ingin menambah ilmu di bidang akustik.
3. **Reseller** dan semua **partner Acourete**, untuk mengetahui lebih dalam material Acourete untuk aplikasi pada bangunan.
4. **Pelajar, mahasiswa, atau masyarakat umum** yang ingin mempelajari teori dan aplikasi praktis akustika bangunan.

Setelah mengikuti kursus online ini, peserta akan memahami:
1. Dampak negatif dari gangguan akustik terhadap produktivitas dan kesehatan.

Harga

Rp 1.380.000,-

DAFTAR PELATIHAN

Share

Pemateri:

1. Retno Ajeng Pratiwi, S.Si., M.Si.

Background pendidikan:

S1 Fisika - Institut Teknologi Sepuluh November

S2 Fisika - Universitas Brawijaya

2. Yana Muhamadinah, S.T., M.T.

Background pendidikan:

S1 Teknik Fisika - Institut Teknologi Bandung

S2 Teknik Fisika - Institut Teknologi Bandung

Penasehat:

1. Husein Avicenna Akil: Seorang periset di Badan Riset dan Inovasi Nasional (BRIN) yang memiliki background akustik terkait dengan penyebaran suara di dalam suatu gedung terutama untuk gedung-gedung bervolume besar.
2. Tim Edukasi Acourete

Benefit.

3 Manfaat dan harapan online course ini:

Benefit.

Setelah mengikuti kursus online ini, peserta akan memahami:

- Dampak negatif dari gangguan akustik terhadap produktivitas dan kesehatan.
- Peraturan pemerintah atau standar akustik bangunan yang harus dicapai.
- Penyebab dan jalur rambatan gangguan kebisingan pada bangunan.
- Menentukan produk dan metode yang tepat atas permasalahan tersebut.
- Menguasai pada tahap middle level tentang ilmu Akustika Bangunan.

Acourete itenas

8 Modul Pelatihan.

BAB 0. Pengantar

BAB 1. Pengantar Akustika Bangunan

BAB 2. Dampak Kebisingan Akustika Bangunan

BAB 3. Standar Baku Kebisingan Indonesia & Internasional

BAB 4. Soundproof vs. Sound Insulation

BAB 5. Analisa Sumber Kebisingan dan Jalur Perambatannya

BAB 6. Peningkatan Performa Insulasi Akustik

BAB 7. Langkah-langkah Pembuatan Ruangan Decoupling Akustik yang Bebas Rambatan Getaran

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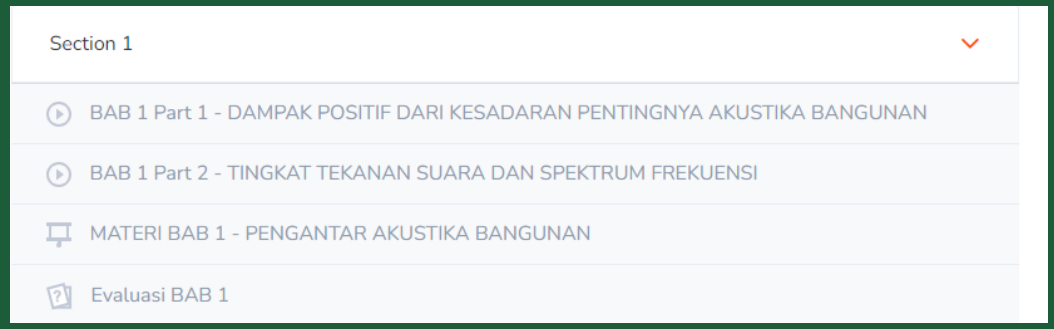
Konten Pelatihan

8 modul

- Section 0
  - BAB O PENGANTAR
  - MATERI BAB 0 - PENGANTAR
- Section 1
- Section 2
- Section 3
- Section 4
- Section 5
- Section 6
- Section 7



Keynote:

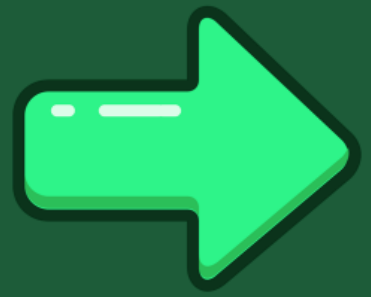
- ✓ Video rekaman penjelasan materi oleh expert narasumber.
- ✓ Slide materi berbentuk PDF.
- ✓ Evaluasi dalam bentuk soal pilihan ganda pada masing-masing modul.

Completion Certificate.

Acourete itenas

Best Deal.

~~Rp 1.380.000,-~~



Rp 300.000-/ Learners

Z34ERS4NAE1D

https://bit.ly/AkustikaBangunanOC

3 main acoustic things to consider.

To summarize, there are 3 main acoustic things we need to consider…

THE NOISE from inside	*THE NOISE from outside*	*Acoustic perception & defect inside the room*
BACKGROUND NOISE	*SOUND INSULATION*	*ROOM ACOUSTIC*

What the ideal conditions for these?

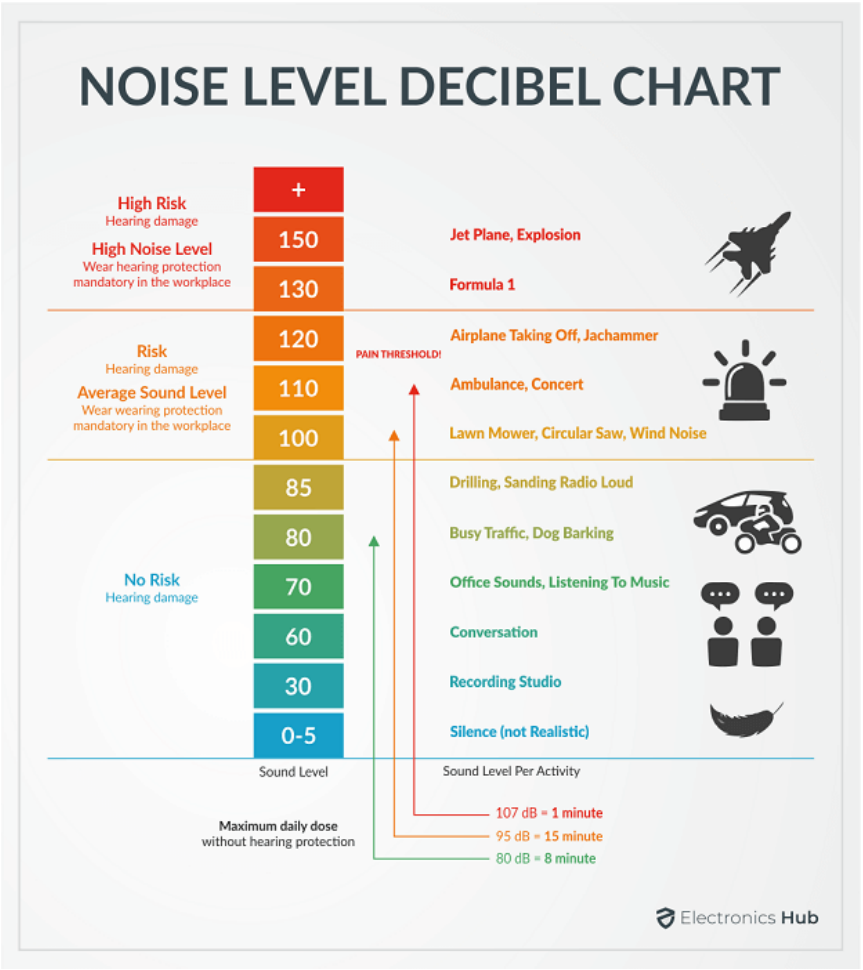
BACKGROUND NOISE

The ambient sound, how much sound the mechanical services make (AC, appliances)

Characterized by

- *LeqA (Sound Pressure Level Equivalent – A weighted)*
- *NC (Noise Criteria)*

Room Purpose	Parameter	Recommended Value	Reference
Ruang Konferensi, lebih dari 250 kursi	NC	35	SNI-03-6386-2000
Ruang Pertunjukan Opera & Musik	NC	30	SNI-03-6386-2000



SOUND INSULATION

The process to reduce the sound transmission through a partition or an object.

Characterized by

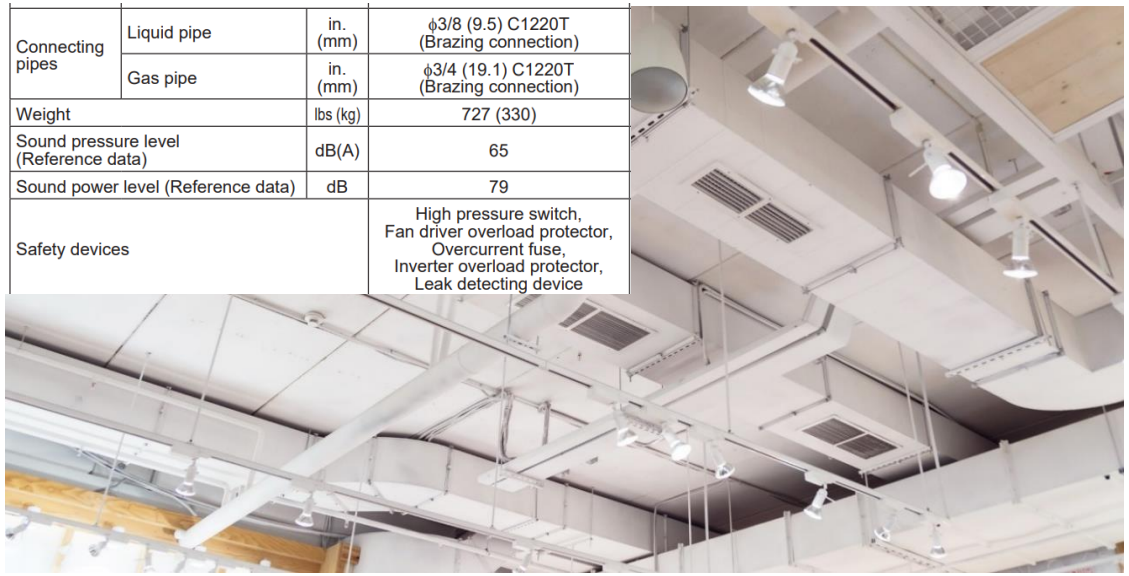
- *STC (Sound Transmission Class)*
- *OITC (Outdoor Indoor Class)*
- *TL (Transmission Loss)*
- *IL (Insertion Loss)*
- *IIC (Impact Insulation Class)*

STC Rating	Privacy Afforded
25	Normal speech easily understood
30	Normal speech audible but not intelligible
35	Loud speech audible and fairly understandable
40	Loud speech audible but not intelligible
45	Loud speech barely audible
50	Shouting barely audible
55	Shouting not audbile

Source: Quieting: A Practical Guide to Noise Control, NBS Handbook 119, National Bureau of Standards, U.S. Department of Commerce, Washington, DC, 1976

To meet the ideal condition where the noise is minimum, we need to…

Connecting pipes	Liquid pipe	in. (mm)	ϕ3/8 (9.5) C1220T (Brazing connection)
	Gas pipe	in. (mm)	ϕ3/4 (19.1) C1220T (Brazing connection)
Weight		lbs (kg)	727 (330)
Sound pressure level (Reference data)		dB(A)	65
Sound power level (Reference data)		dB	79
Safety devices			High pressure switch, Fan driver overload protector, Overcurrent fuse, Inverter overload protector, Leak detecting device



Choose the right type of appliances and mechanical services

Choose the right type of partition and insulation treatment

ROOM ACOUSTIC

The sound perception inside the room. How the sound bounces around within space and reflected from the surfaces.

Is there any defect?

Characterized by

- *RT (Reverberation Time)*
- *D50, C80 (Clarity)*
- *STI (Sound Transmission Index)*
- *LF (Lateral Fraction)*
- *BR (Bass Ratio)*

How room acoustics treatment improve the sound

Tanpa peredam suara

Penambahan peredam suara 10% dari total luas permukaan ruang.

Penambahan peredam suara 40% dari total luas permukaan ruang.

What can influence the room acoustic?

Volume

Building's geometri (shape)

Interior surfaces's shape

Finishing material

What can influence the room acoustic?

Volume

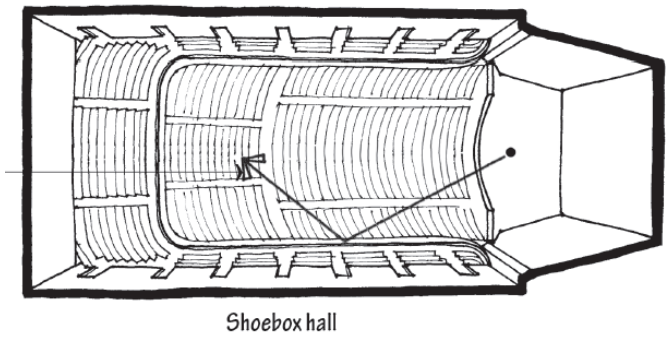
Regards to the room capacity.

Larger volume has higher reverberance

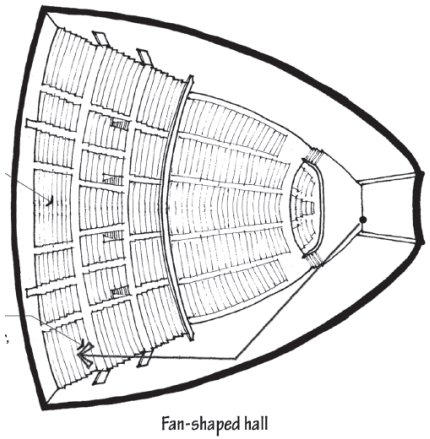
What can influence the room acoustic?

Building's geometri (shape)

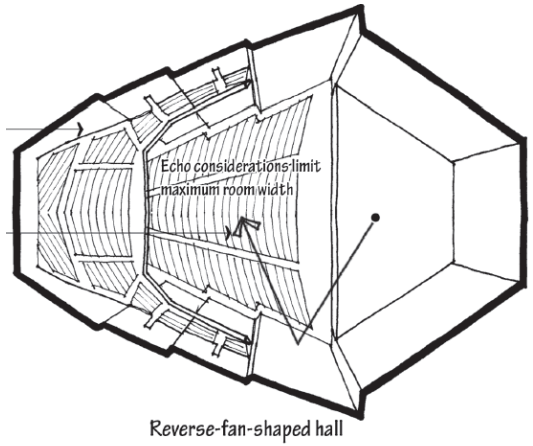
Regards to the stage position, seat capacity, and intimacy with the audience.



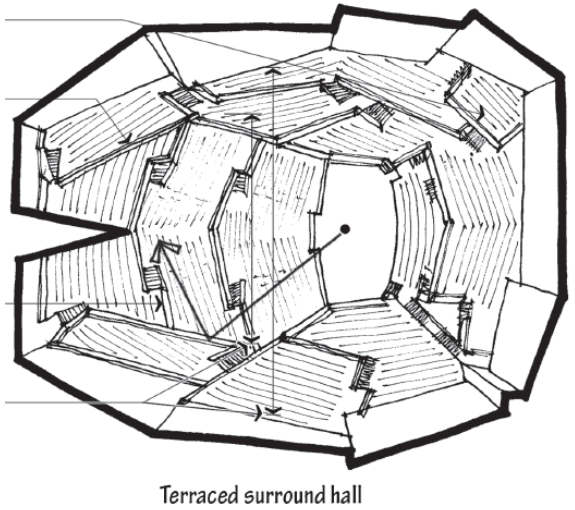
Shoebox



Fan-shaped



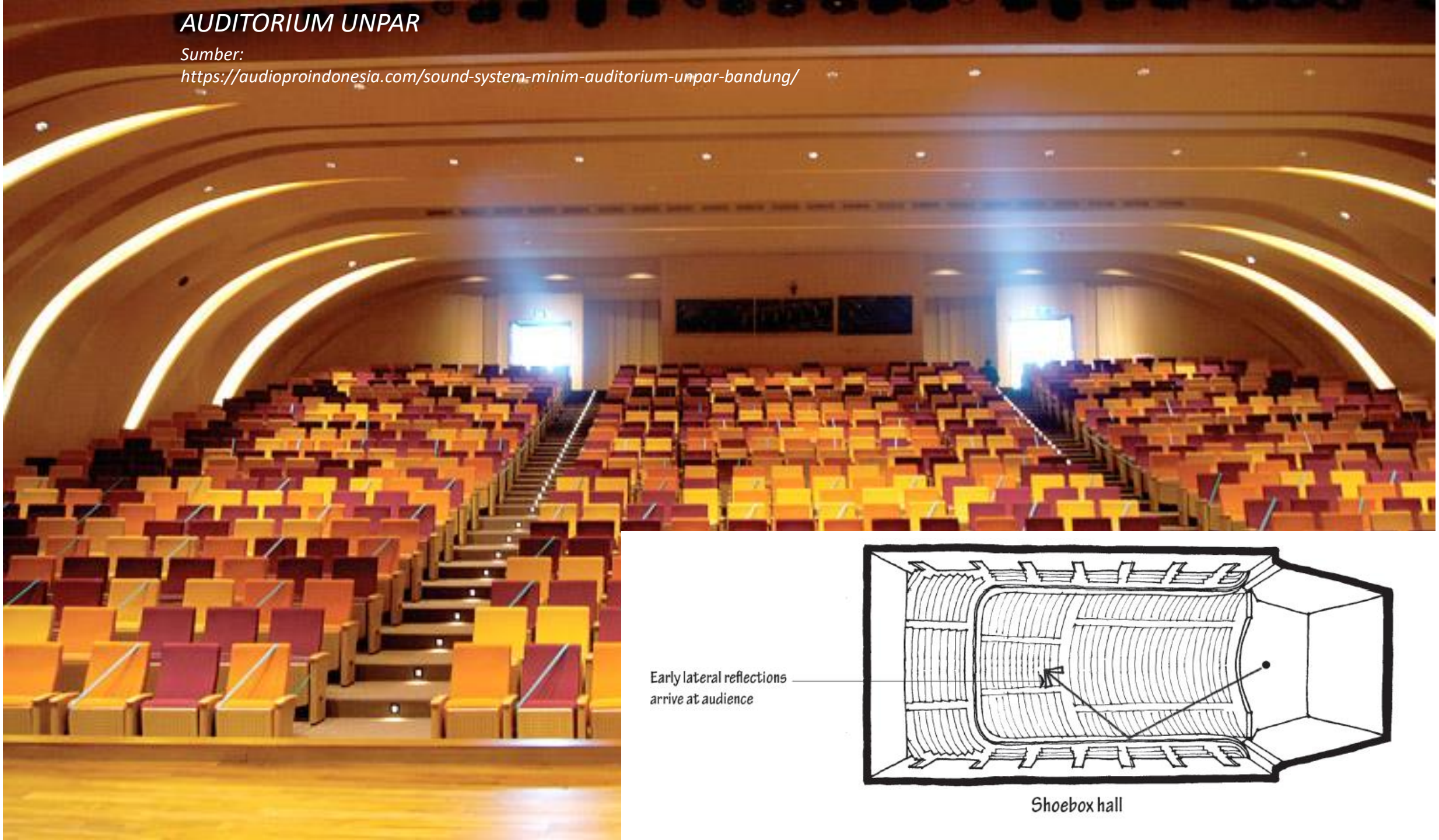
Reverse-fan-shaped



Vineyard

AUDITORIUM UNPAR

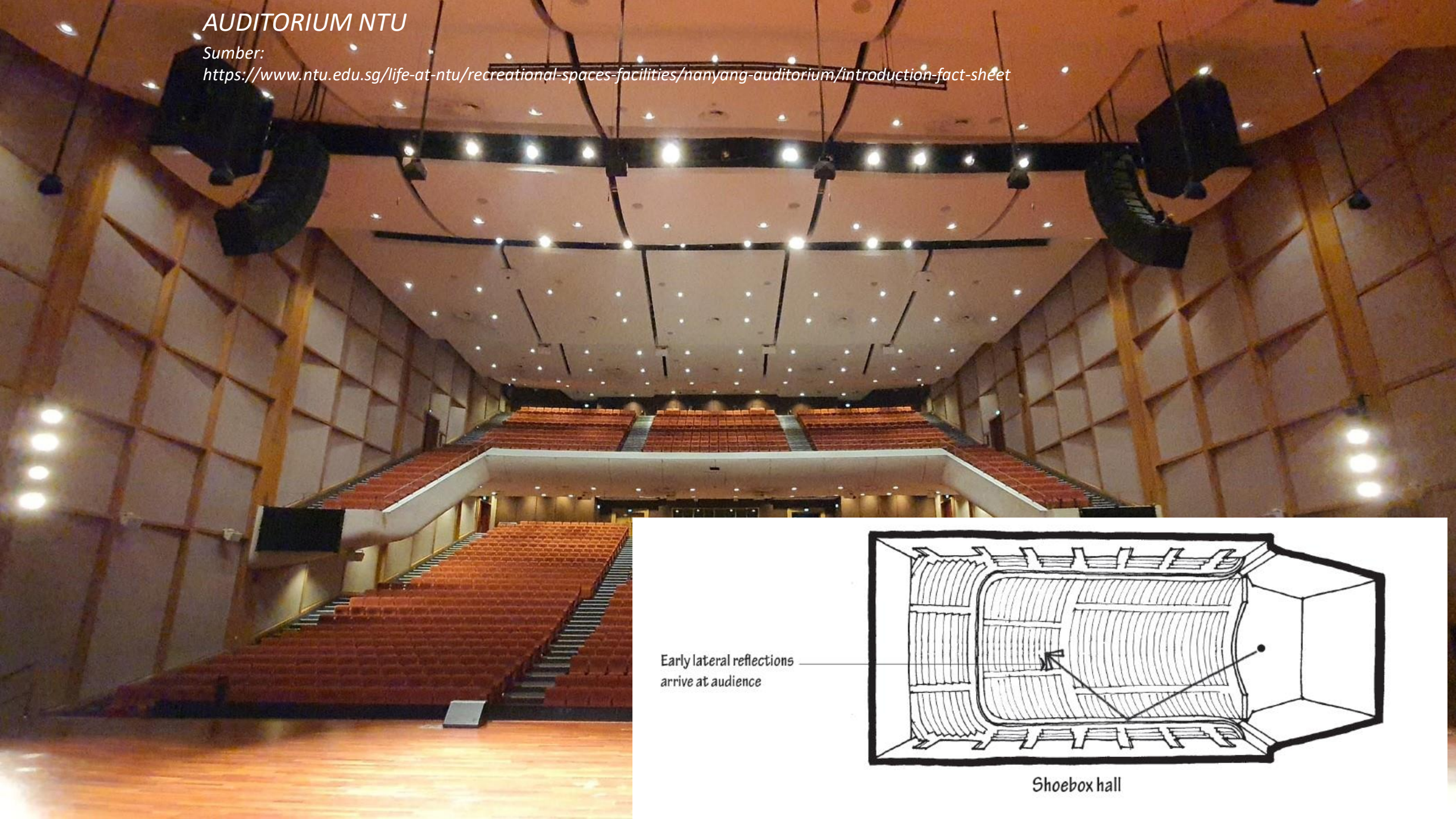
Sumber:
https://audioproindonesia.com/sound-system-minim-auditorium-unpar-bandung/



Shoebox hall

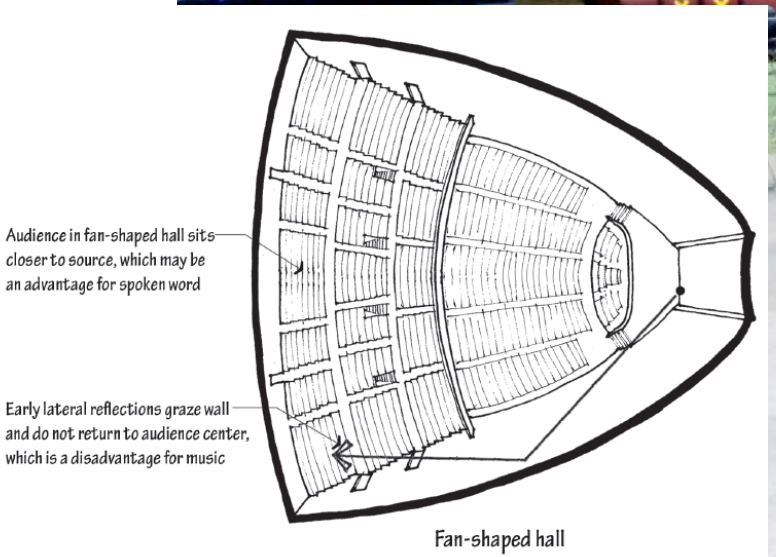
AUDITORIUM NTU

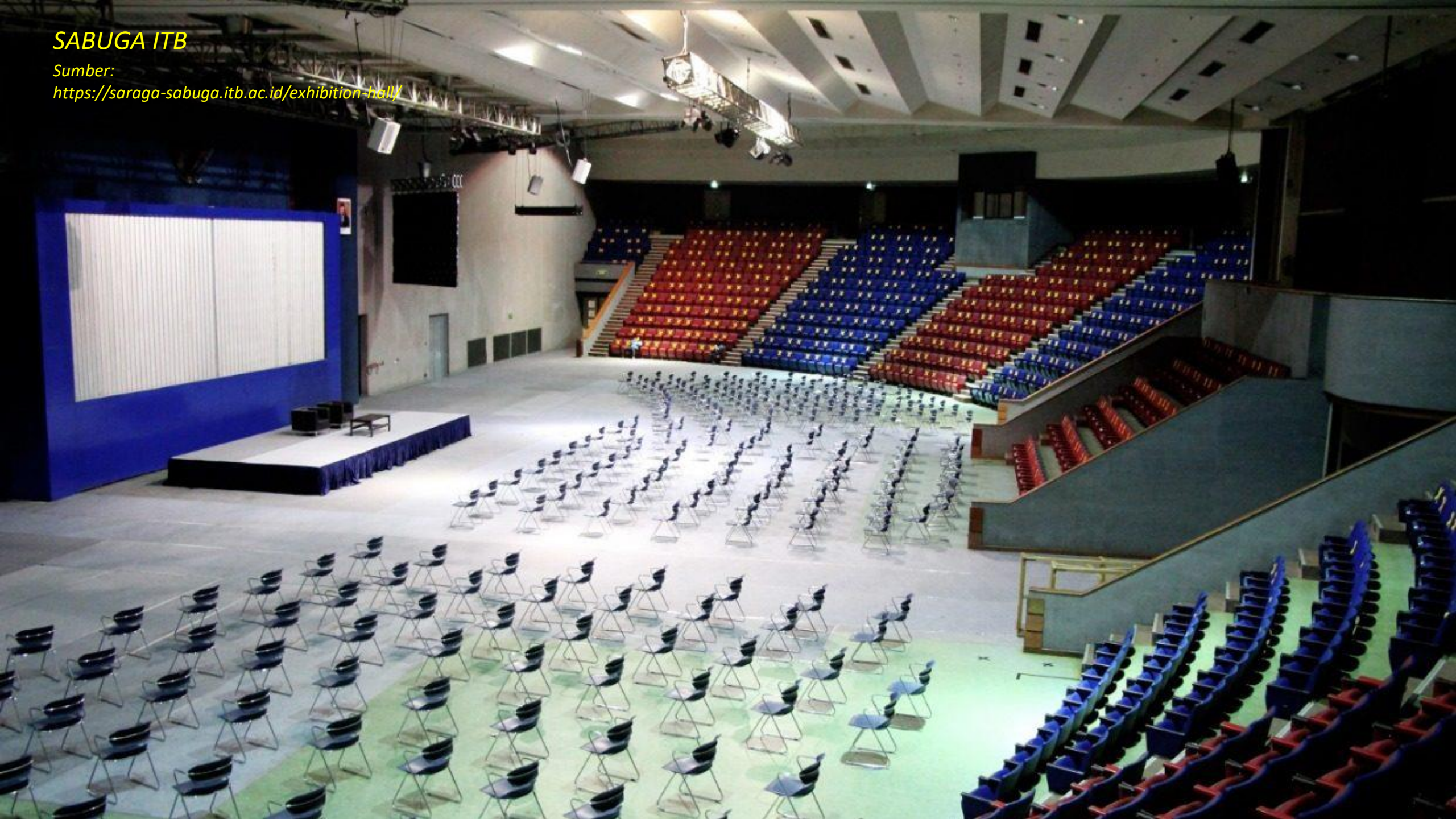
Sumber:
https://www.ntu.edu.sg/life-at-ntu/recreational-spaces-facilities/nanyang-auditorium/introduction-fact-sheet



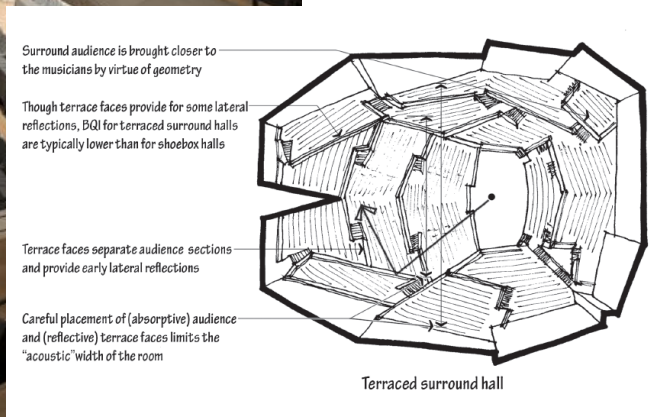
SABUGA ITB

Sumber:
https://saraga-sabuga.itb.ac.id/exhibition-hall/




SABUGA ITB
Sumber:
https://saraga-sabuga.itb.ac.id/exhibition-hall/

The Elbphilharmonie, a concert-hall complex in Hamburg
Sumber:
https://www.washingtonpost.com/graphics/augmented-reality/what-perfect-sound-looks-like/

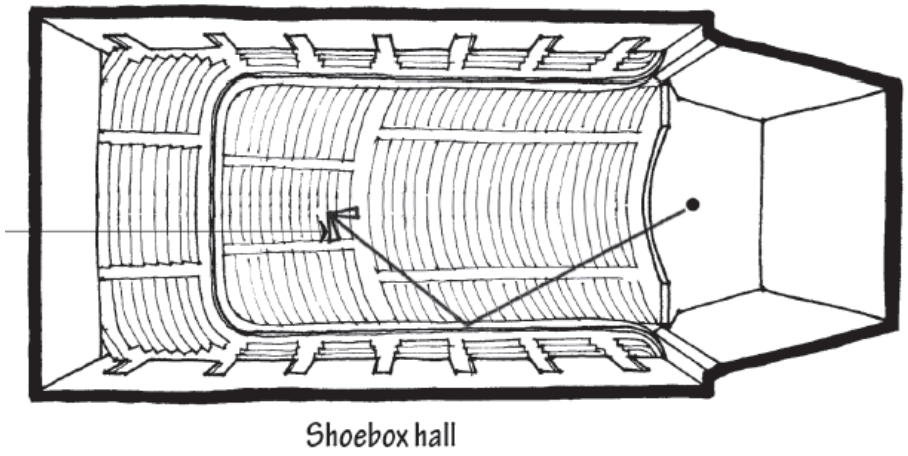


Terraced surround hall

What can influence the room acoustic?

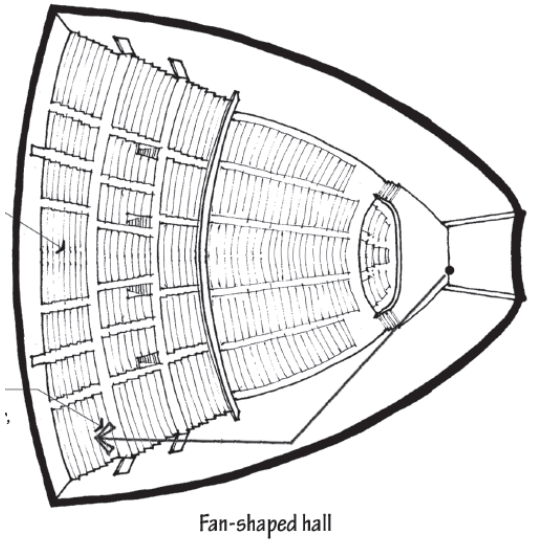
Interior surfaces's shape

Regards to the building geometri and designed interior



Shoebox hall

Parralel surfaces create acoustic defect: echo, flutter echo

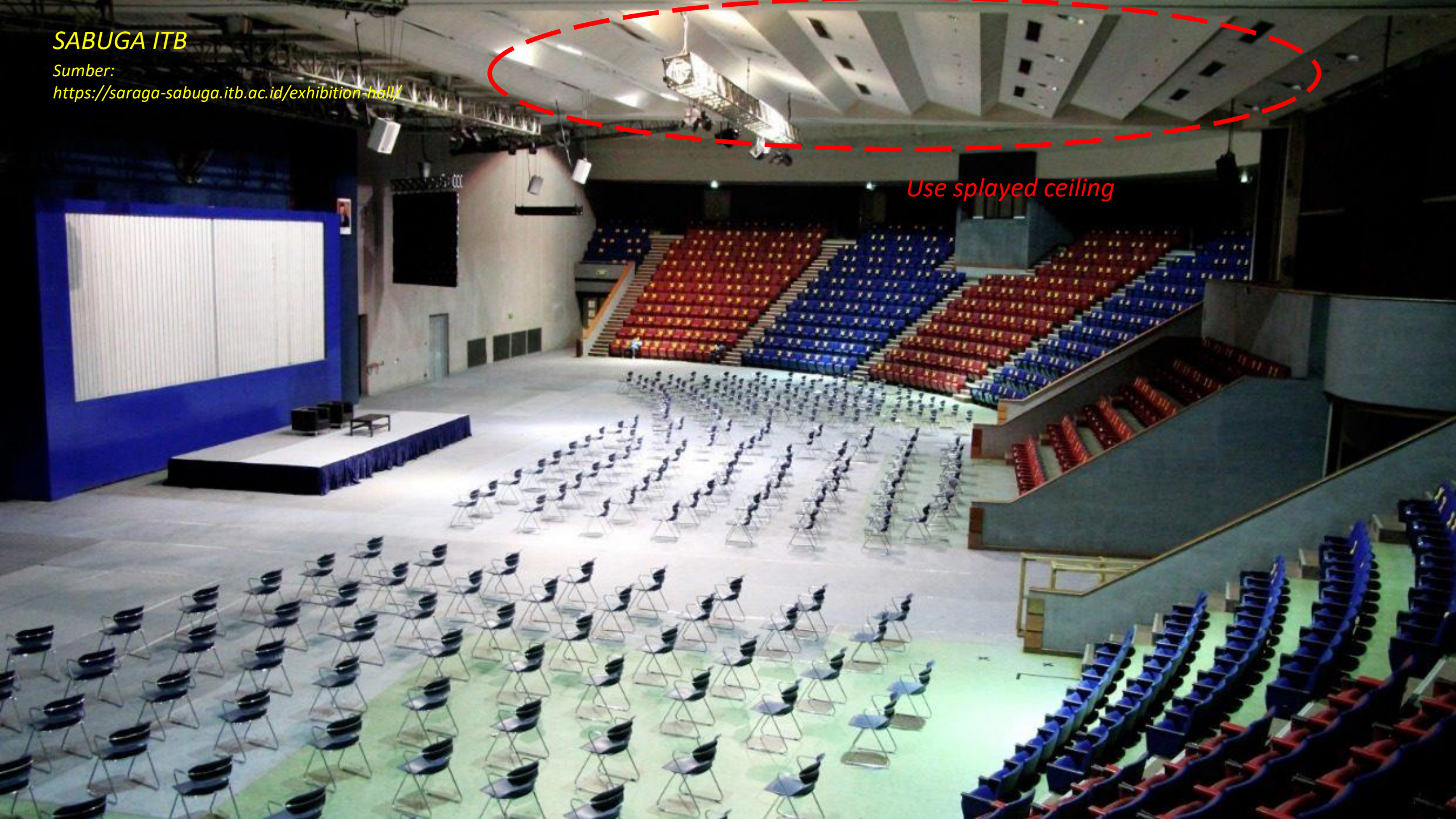


Fan-shaped hall

Circular or curved surfaces create acoustic defect: sound foci

Ruang AVI Canisius College

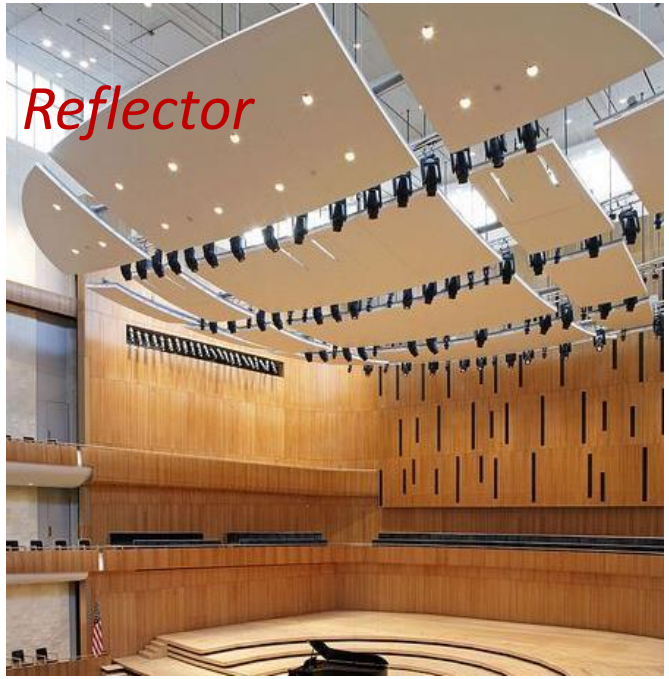
Sumber:
ACOURETE


SABUGA ITB
Sumber:
https://saraga-sabuga.itb.ac.id/exhibition-hall/
Use splayed ceiling

What can influence the room acoustic?

Finishing material

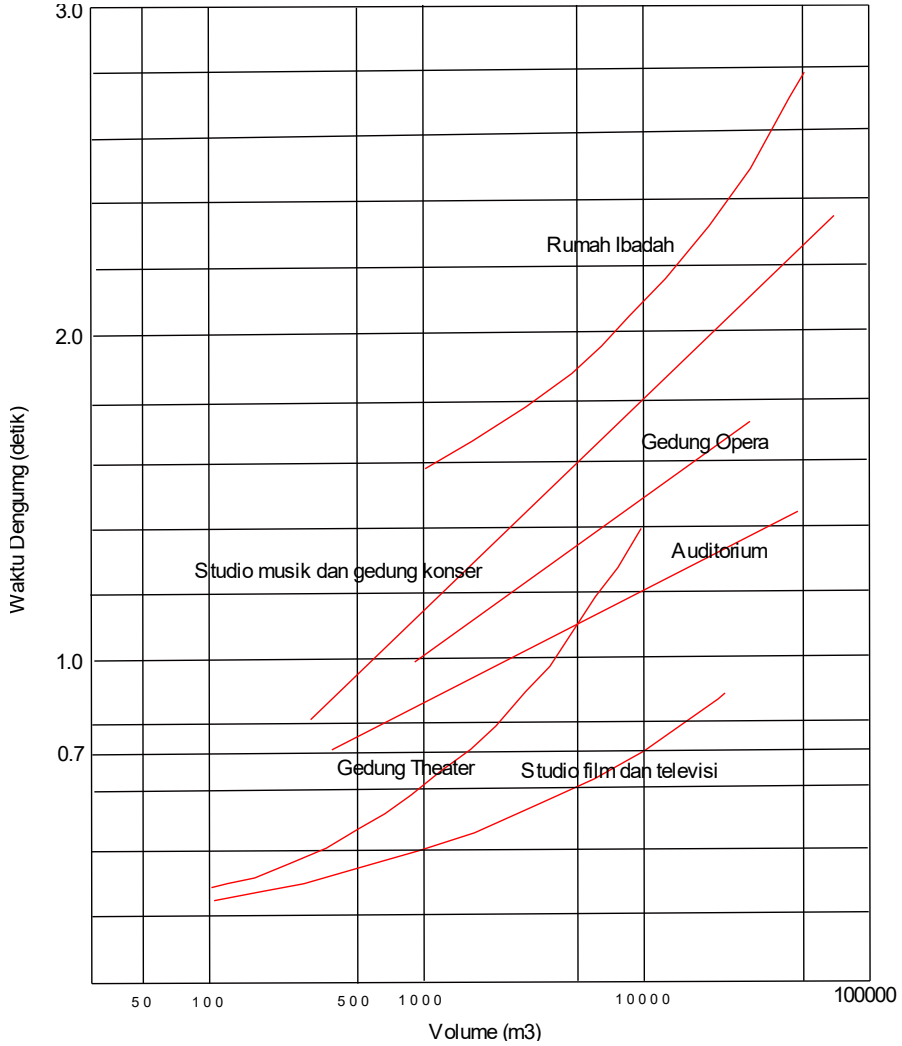
Regards to the designed interior



The ideal condition where the room acoustic is optimum…

NO DEFECT!

- *Sound distributed equally*
- *No too much reverb,*
- *No echo, flutter echo, sound foci*



Reverberation Time
SNI-03-6386-2000

The ideal condition where the room acoustic is optimum…

D50, C80 (ISO 3382-1)

Table A.1 — Acoustic quantities grouped according to listener aspects

Subjective listener aspect	Acoustic quantity	Single number frequency averaging [a] Hz	Just noticeable difference (JND)	Typical range [b]
Subjective level of sound	Sound strength, G, in decibels	500 to 1 000	1 dB	–2 dB; +10 dB
Perceived reverberance	Early decay time (EDT) in seconds	500 to 1 000	Rel. 5 %	1,0 s; 3,0 s
Perceived clarity of sound	Clarity, C_{80}, in decibels	500 to 1 000	1 dB	–5 dB; +5 dB
	Definition, D_{50}	500 to 1 000	0,05	0,3; 0,7
	Centre time, T_S, in milliseconds	500 to 1 000	10 ms	60 ms; 260 ms
Apparent source width (ASW)	Early lateral energy fraction, J_{LF} or J_{LFC}	125 to 1 000	0,05	0,05; 0,35
Listener envelopment (LEV)	Late lateral sound level, L_J, in decibels	125 to 1 000	Not known	–14 dB; +1 dB

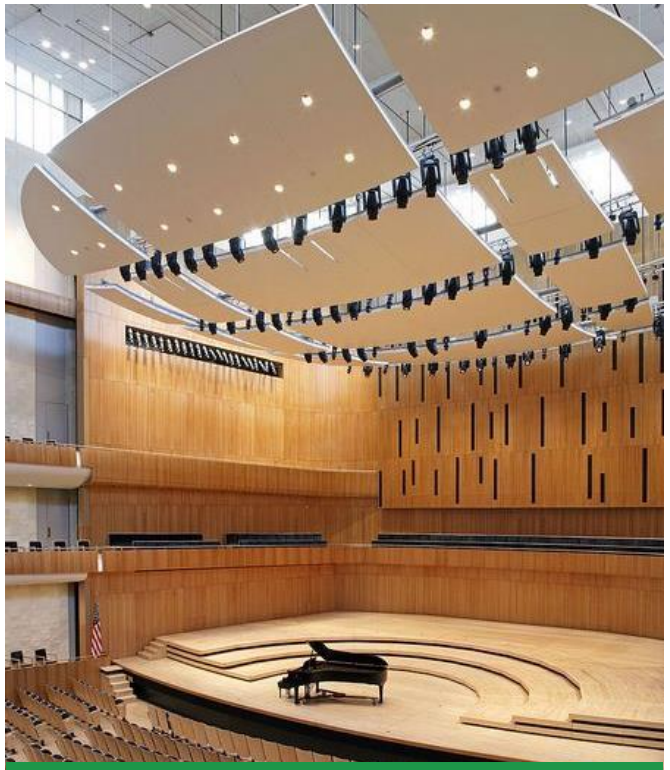
[a] The single number frequency averaging denotes the arithmetical average for the octave bands, except for L_J which shall be energy averaged [see (A.17)].

[b] Frequency-averaged values in single positions in non-occupied concert and multi-purpose halls up to 25 000 m^3.

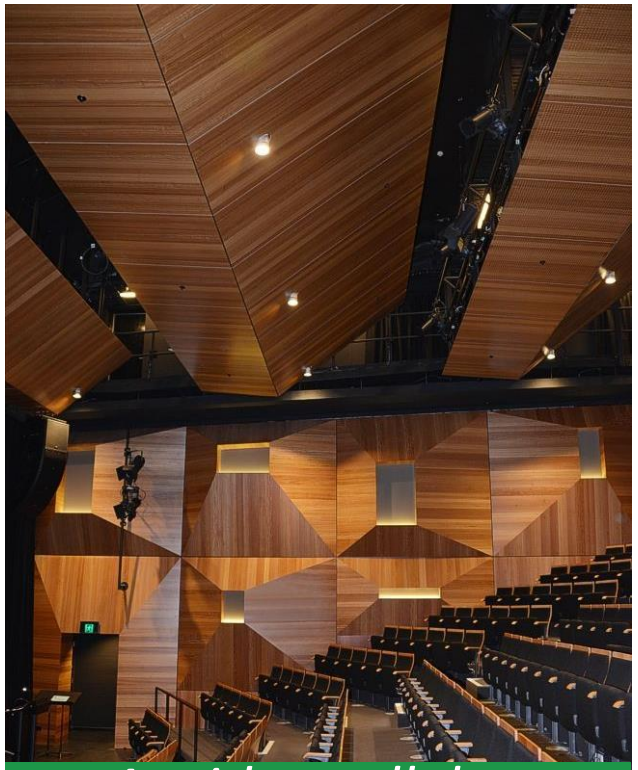
STI (IEC 60268-16)

Band	STI Range	Examples of typical uses
A+	> 0.76	Recording studios
A	0.74- 0.76	Theatres, speech auditoria, parliaments, courts
B	0.70 - 0.74	Theatres, speech auditoria, parliaments, courts
C	0.66 - 0.70	Teleconference, theatres
D	0.62 - 0.66	Classrooms, concert halls
E	0.58 - 0.62	Concert halls, modern churches
F	0.54 - 0.58	PA in shopping malls, public offices, cathedrals
G	0.50- 0.54	PA in shopping malls, public offices
H	0.46 - 0.50	PA in difficult acoustic environments
I	0.42- 0.46	PA in very difficult spaces
J	0.38 - 0.42	Not suitable for PA systems
U	< 0.36	Not suitable for PA systems

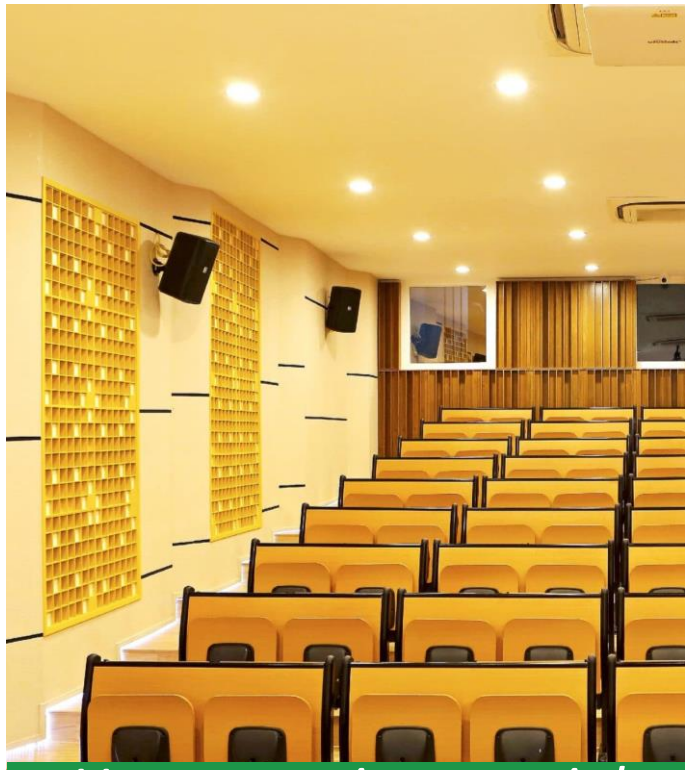
To meet the ideal condition where the room acoustic is optimum…



Choose the right shape!



Avoid parallel or curved wall!

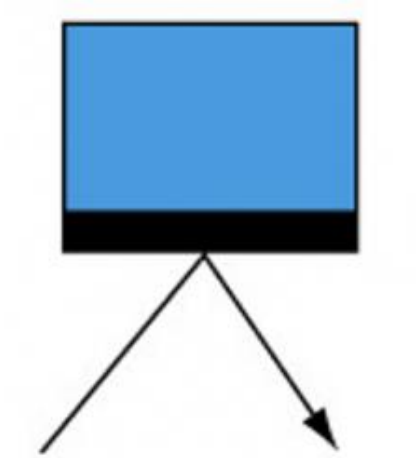


Use acoustic material for additional treatment

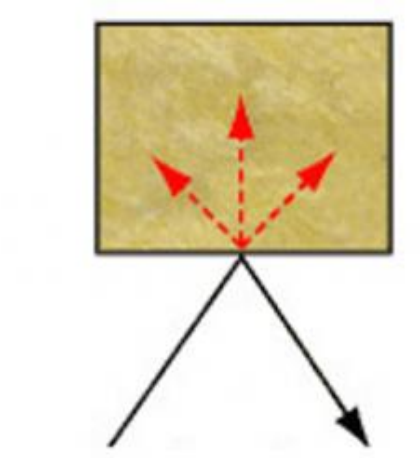
Photo references: Pinterest, Acourete

Acoustic materials.

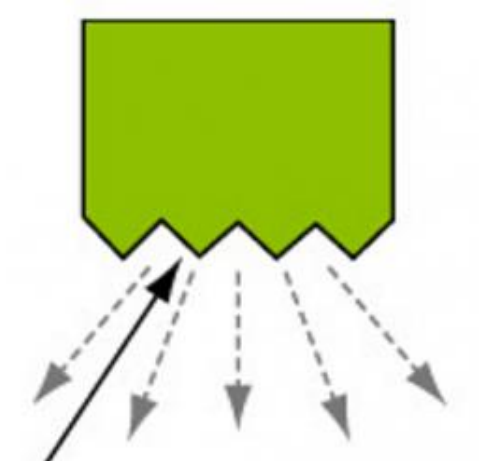
ACOUSTIC MATERIALS



Material Insulasi



Material Absorber



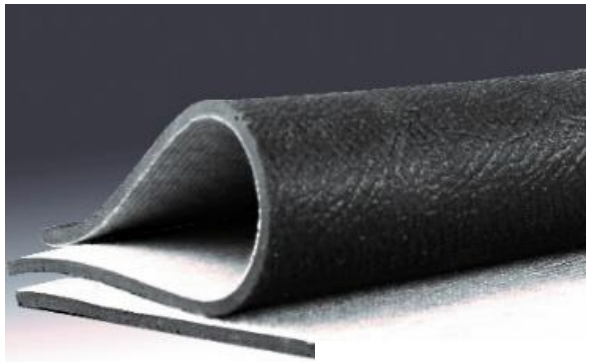
Material Diffuser

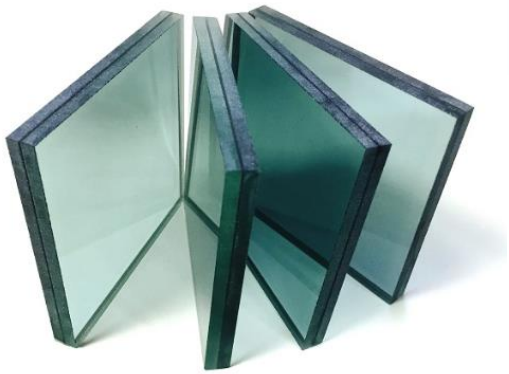
Choose material in regard to their reaction to the sound.

ACOUSTIC MATERIALS - *Insulation*

Material characteristics

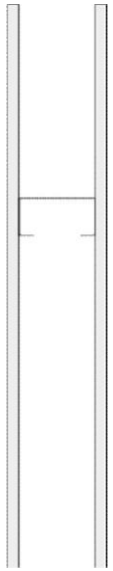
- High density
- High mass
- Non-porous





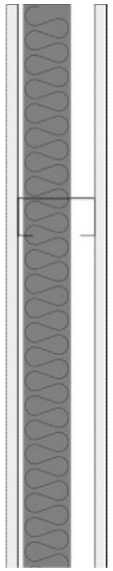
*Insulation performance rated using **STC (Sound Transmission Class)***

How insulation material reduce the noise…



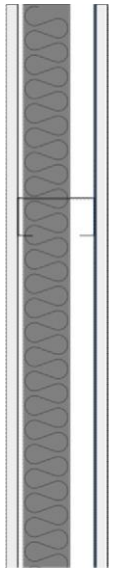
Without insulation material

STC 36
OITC 23



With insulation - rockwool

STC 41
OITC 26



With insulation - rockwool & Acourete Noise Armour

STC 44
OITC 28

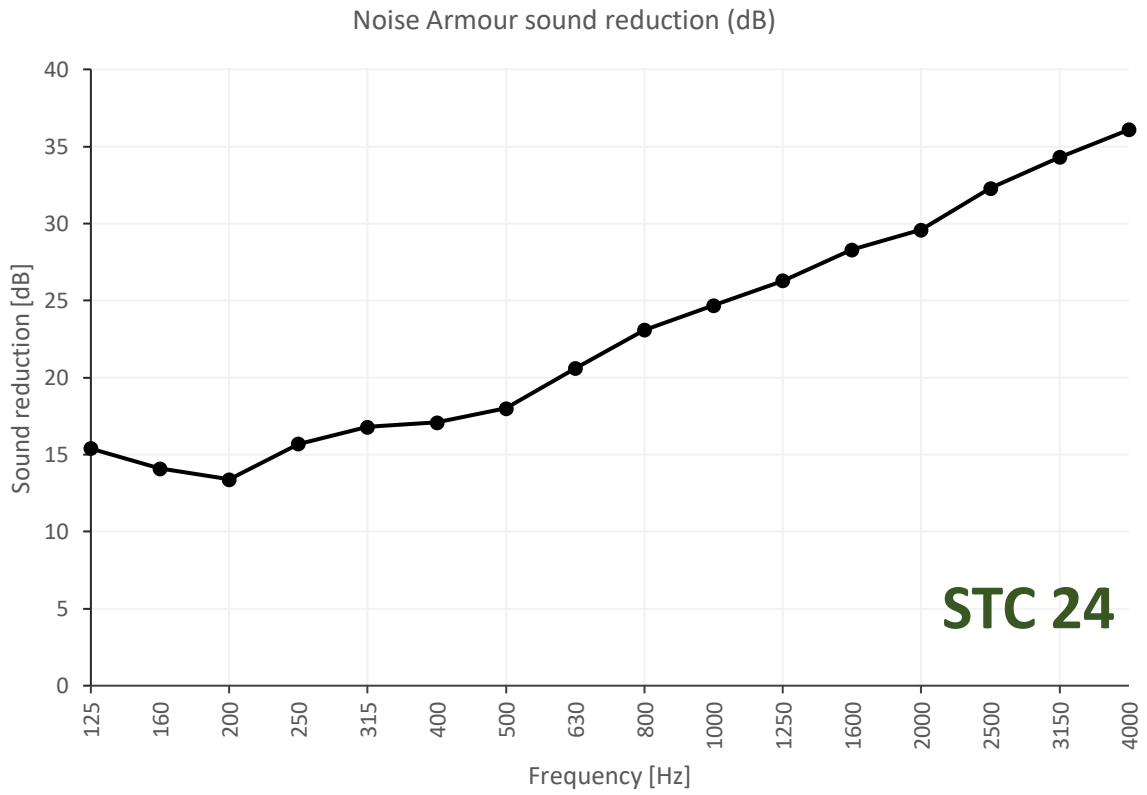
ACOURETE NOISE ARMOUR

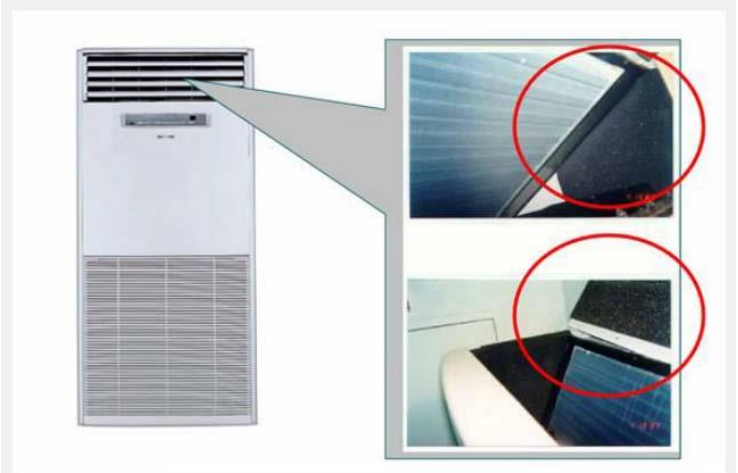
Description	Value
Type	Acoustic Vibration Insulation
Dimension	1.000 mm x 1.000 mm x 2 mm
Material	Resin
Mass	4 kg
Density	2.000 kg/m3
STC	24
Color	Black
Country of Origin	South Korea

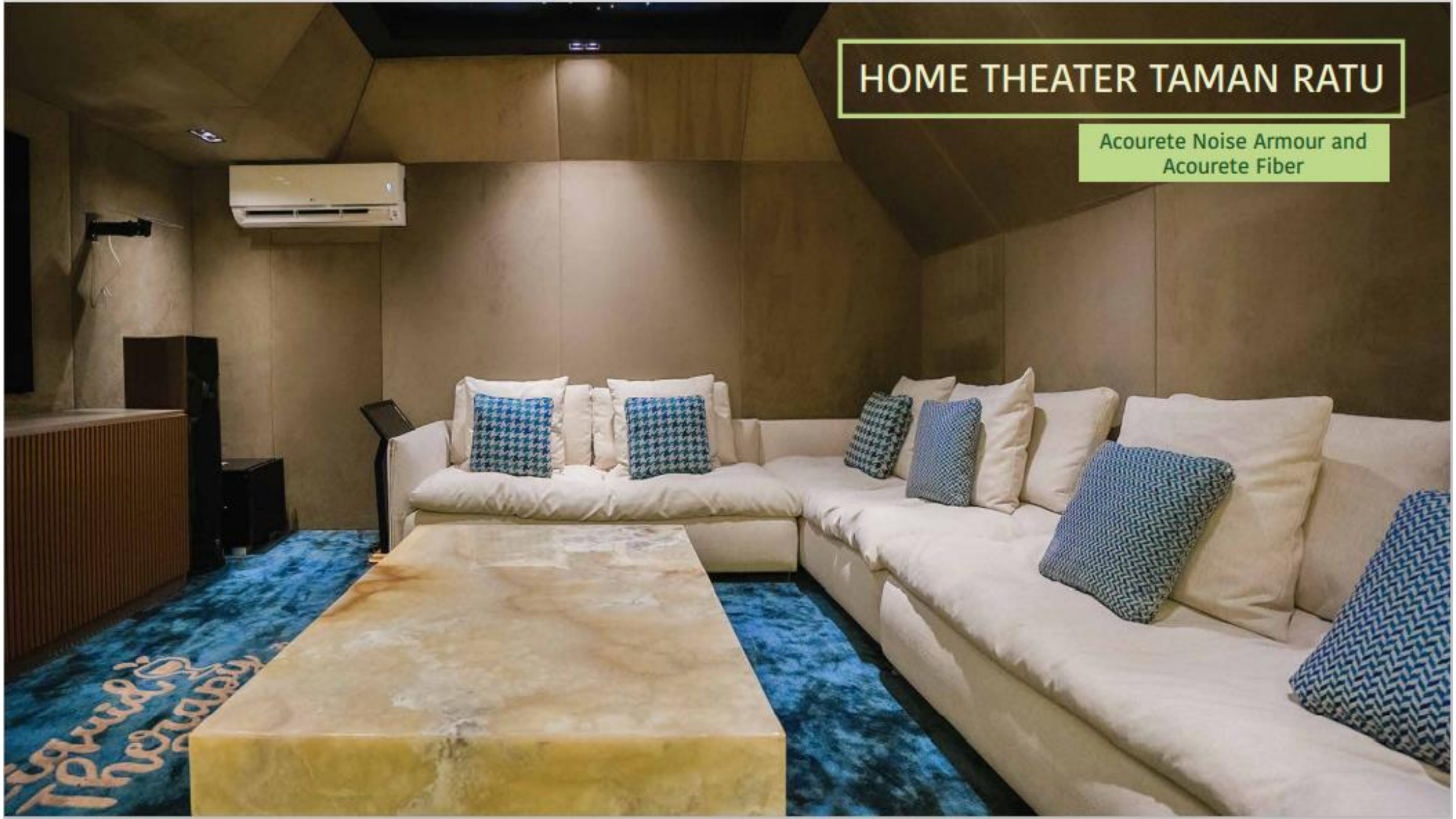
Broadcast studio, Music recording, Home theater, Karaoke room, Auditorium, Music hall, Discotheque, Office, Machine room

Allergy free, toxic free, fire safety, viscoelastics

ACOURETE NOISE ARMOUR

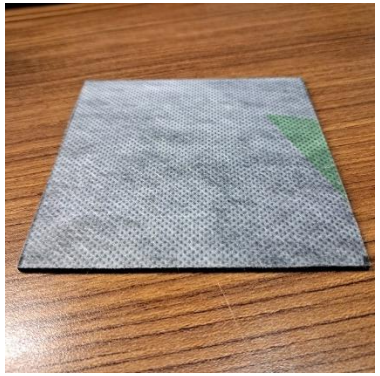





HOME THEATER TAMAN RATU
Acourete Noise Armour and
Acourete Fiber


MEETING ROOM DBS
Acourete Noise Armour
More

ACOURETE SILENT WALL

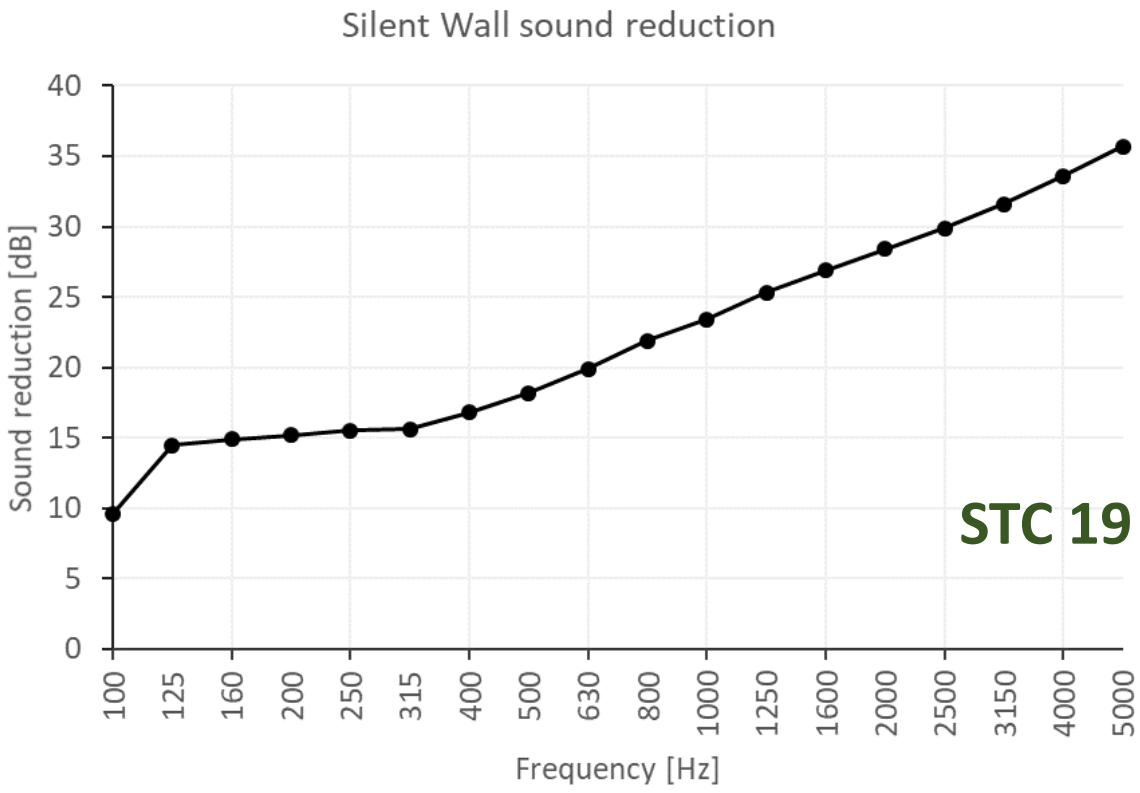


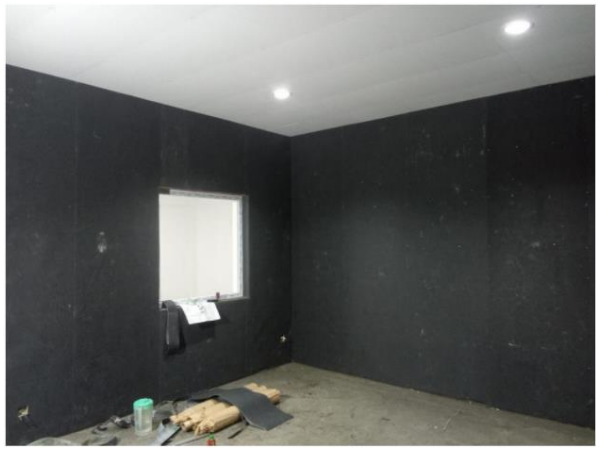
Description	Value
Type	Acoustics Vibration Insulation
Dimension	4.880mm x 810mm x 2mm
Material	PVC
Mass	15 kg
Density	1.750 kg/m3
STC	19
Colour	Black
Country of Origin	Japan

Allergy free, toxic free, fire safety, viscoelastics

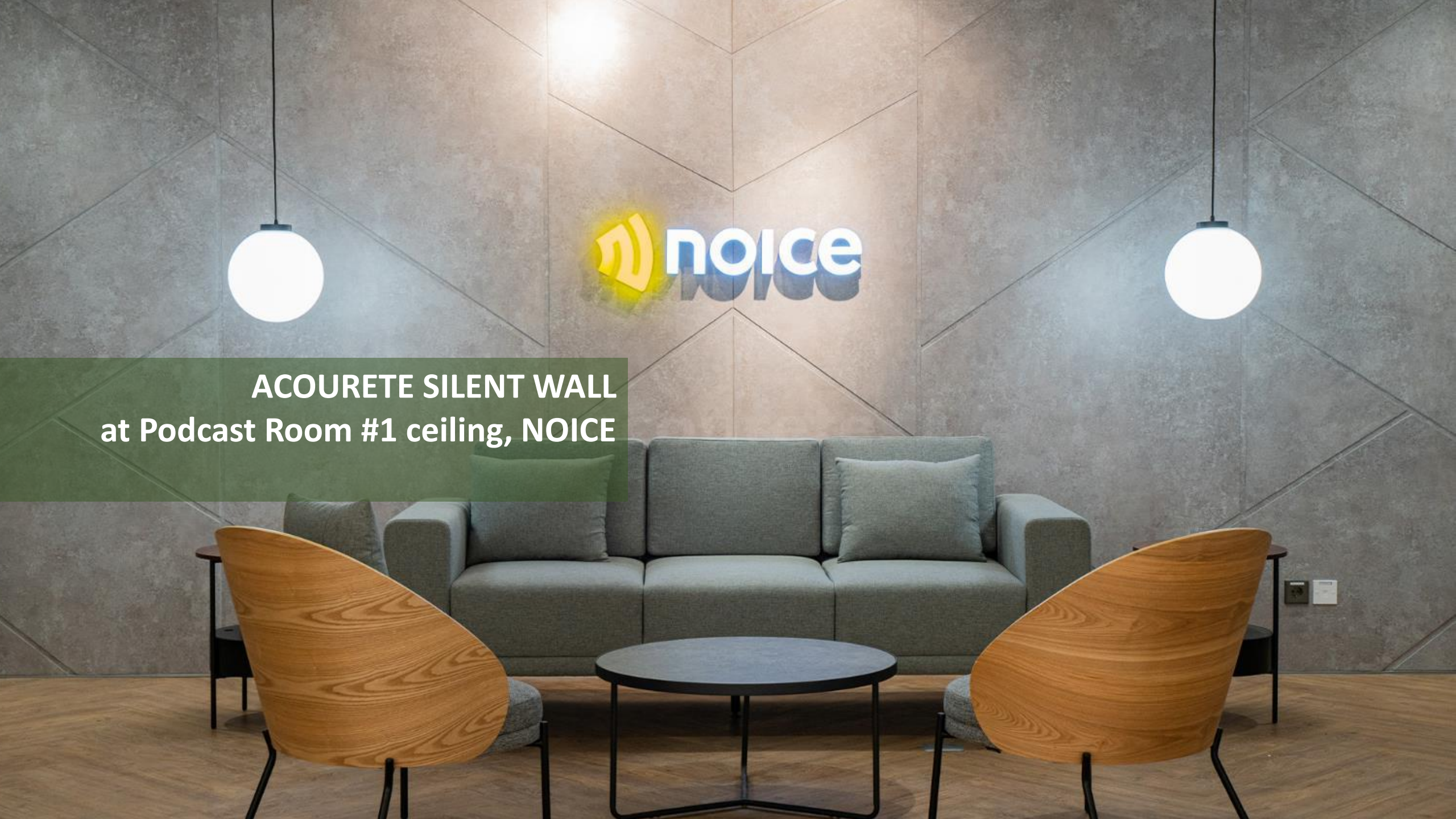
Broadcast studio, Music recording, Home theater, Karaoke room, Auditorium, Music hall, Discotheque, Office, Machine room

ACOURETE SILENT WALL





#MENUJUSUARABAIK



ACOURETE SILENT WALL
at Podcast Room #1 ceiling, NOICE


ACOURETE SILENT WALL
at VIP Karaoke Room, Alila SCBD

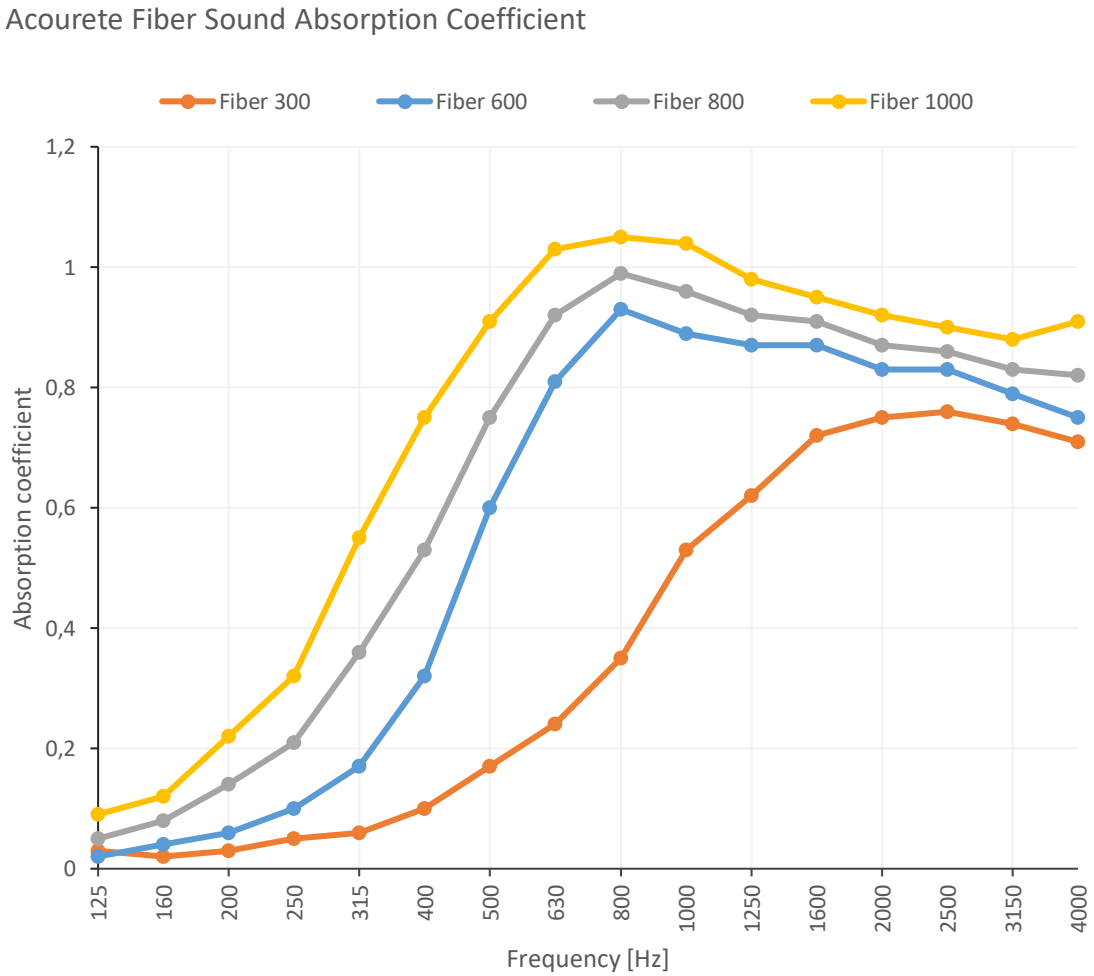
ACOURETE FIBER

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/m³, Fiber 600 : 100 kg/m³ Fiber 800 : 125 kg/m³, Fiber 1000 : 150 kg/m³
Colour	White
Country of Origin	Korea

Allergy free, toxic free, fire resistant

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

ACOURETE FIBER



#MENUJUSUARABAIK


ACOURETE FIBER
at Podcast Room #4 ceiling, NOICE

ACOURETE REGUPOL SONUS MULTI 3

Description	Value
Type	Vibration Damping
Dimension	1000mm x 1000mm x 3 mm
Material	PUR - Foam and Cork Elastomer
Weight	2,1 kg /m2
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

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

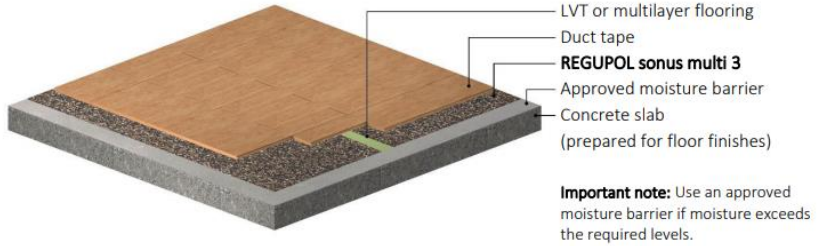
Hotel, Office, Hospital, Home theater, Music studio, Karaoke room, Gym

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 VIBRATION 150

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

Allergy free, toxic free, low natural frequency

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

ACOURETE REGUFOAM VIBRATION 150

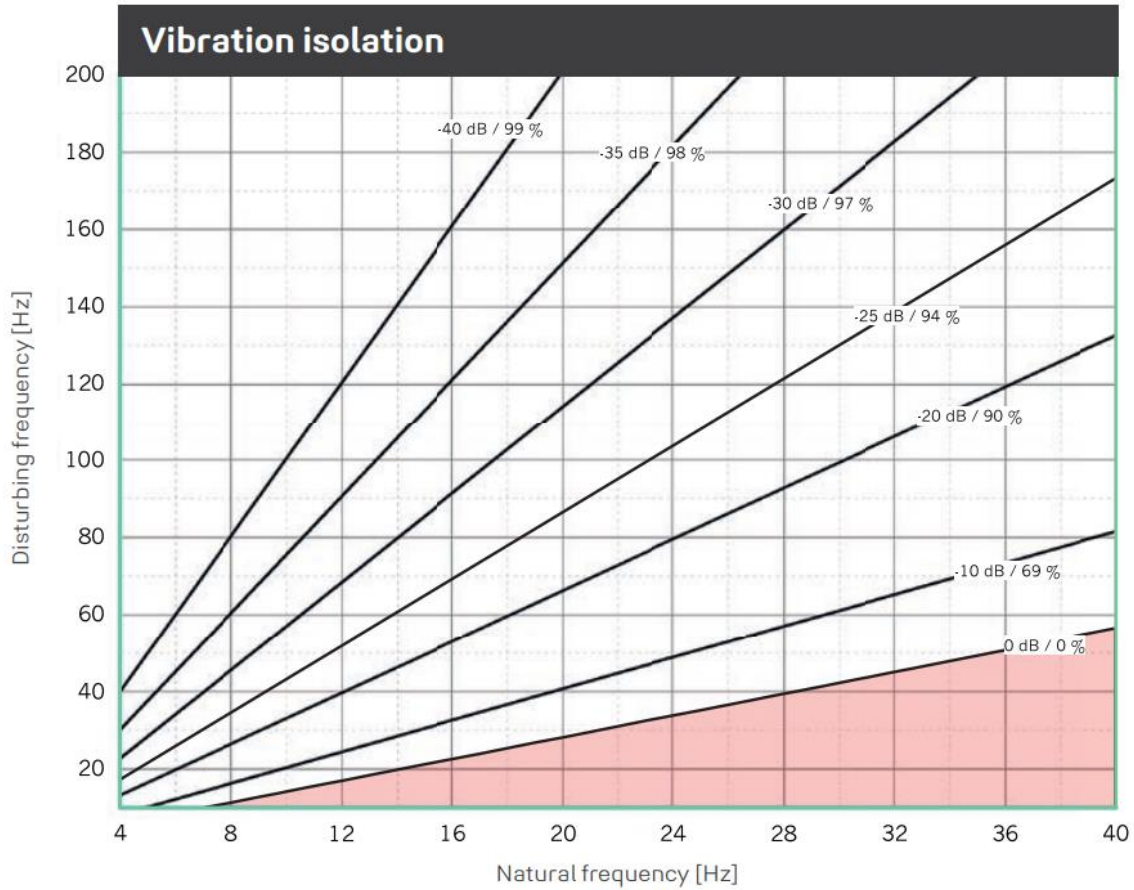


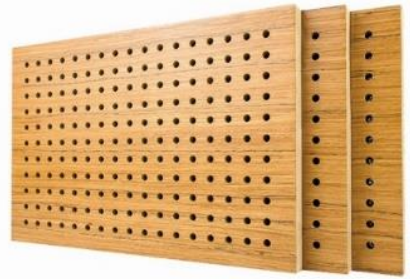
Illustration of the isolation efficiency of a single-degree-of-freedom system (SDOF system) on a rigid base with **REGUFOAM vibration 150plus.** Parameter: power transmission (insertion loss) in dB, isolation factor in %.

#MENUJUSUARABAIK

ACOUSTIC MATERIAL - Absorption

Material characteristics

- Low density
- Low mass
- Porous



Absorption performance rated using NRC (Noise Reduction Coefficient)

Before Treatment

Suara Ucap	Choir	Musik

After Treatment

Suara Ucap	Choir	Musik

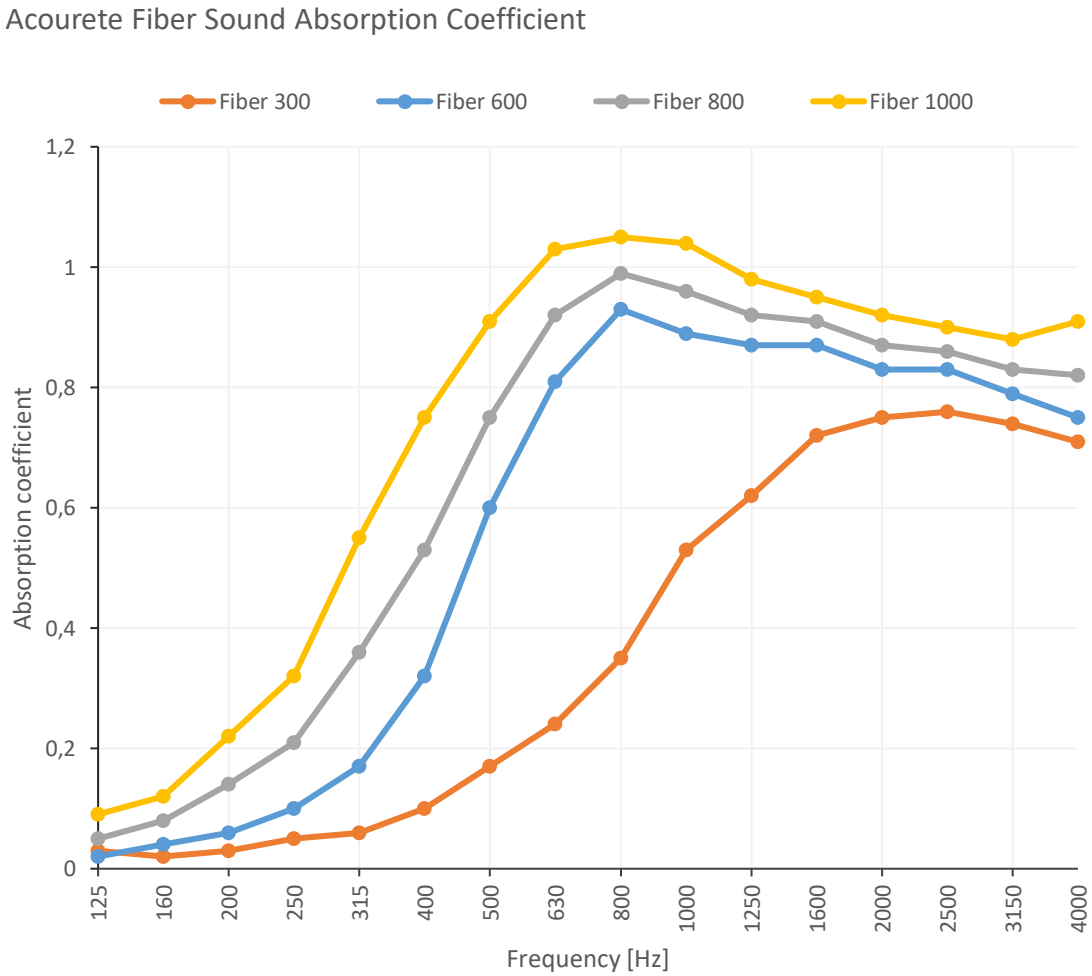
ACOURETE FIBER

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/m³, Fiber 600 : 100 kg/m³ Fiber 800 : 125 kg/m³, Fiber 1000 : 150 kg/m³
Colour	White
Country of Origin	Korea

Allergy free, toxic free, fire resistant

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

ACOURETE FIBER



#MENUJUSUARABAIK


ACOURETE FIBER
at Jatinegara Music Studio


ACOURETE FIBER
at Audiophile Room, Sindanglaya


ACOURETE FIBER
at Family Home Theatre, HALLING
#REVOLUTIONARYMOVEMENT


PPM MEETING ROOM
Acourete Fiber

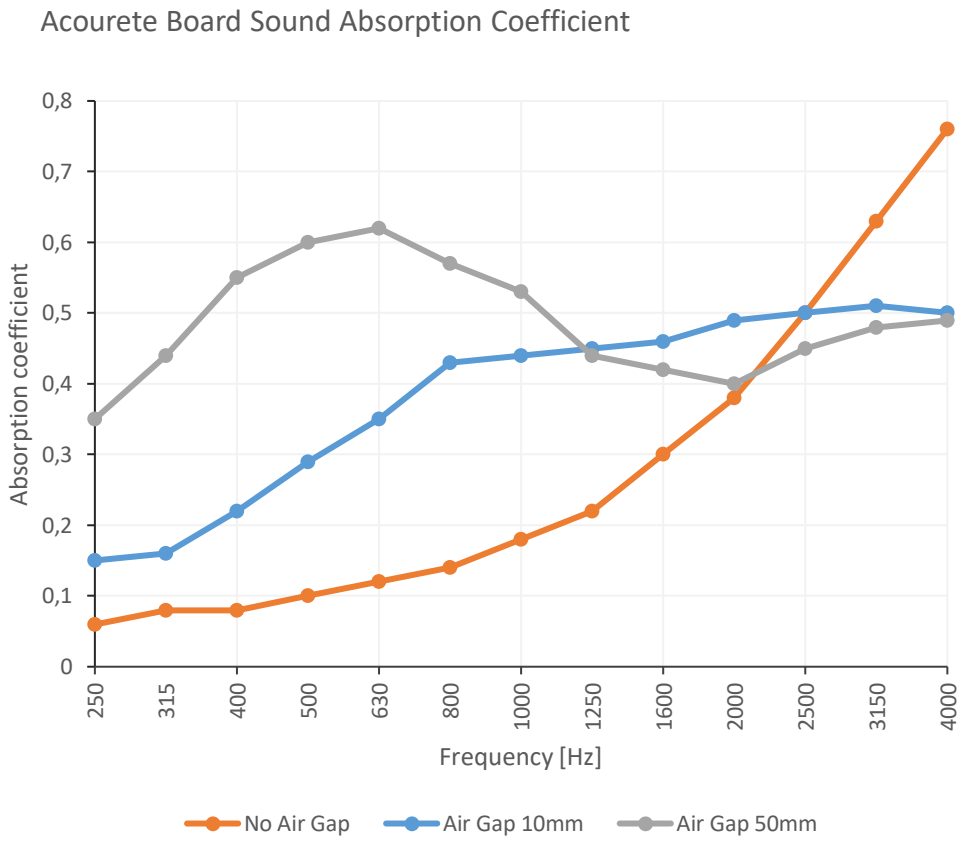
ACOURETE BOARD 230

Allergy free, toxic free, fire resistant

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

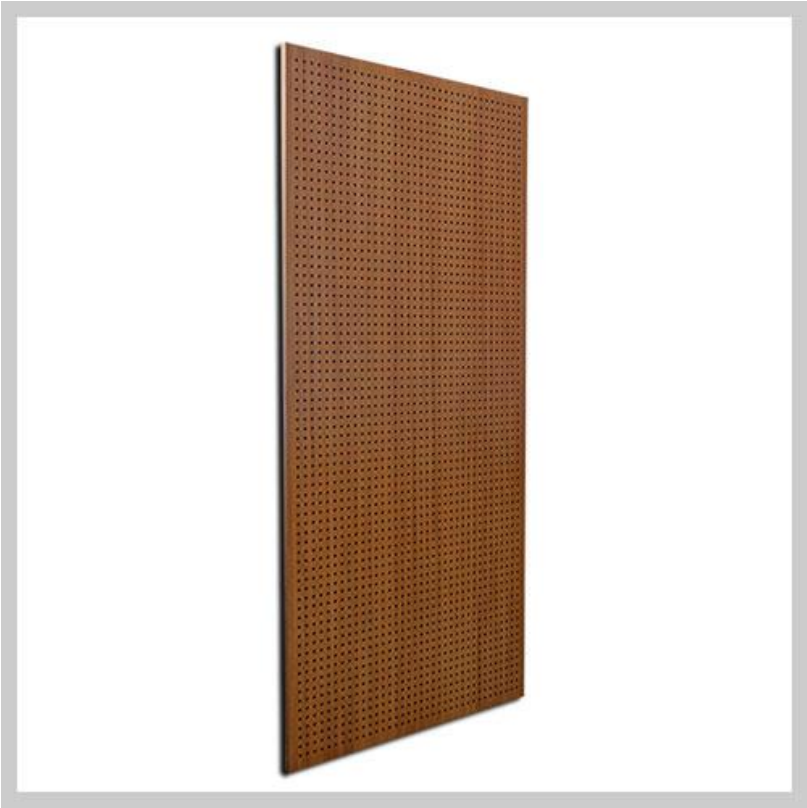
ACOURETE BOARD 230




DIAMOND GOLF HOUSE
Acourete Board


ACOURETE BOARD 230
at Music Room, Koopsudnas HALIM

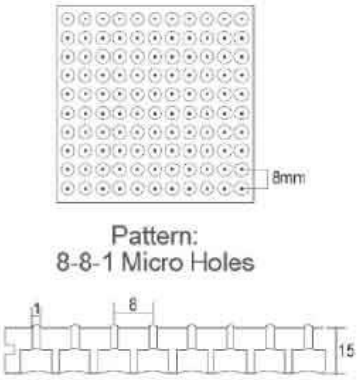
ACOURETE PERFOWOOD

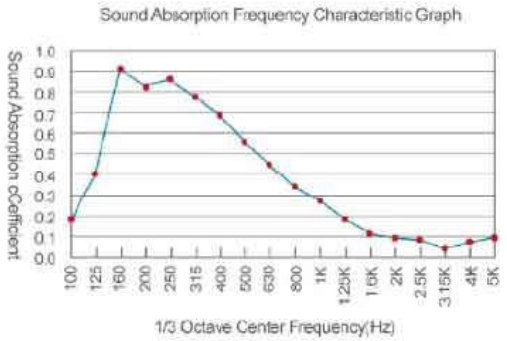


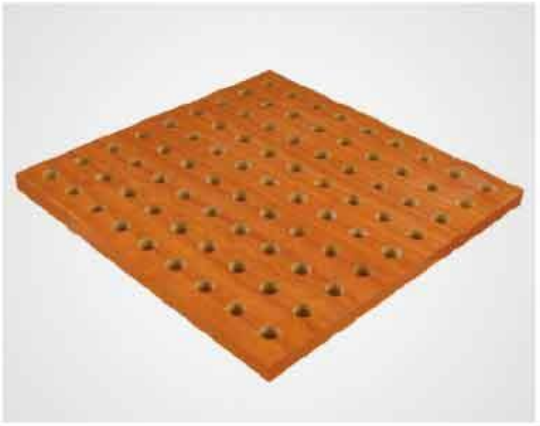
Hall, Home theater, Karaoke room, Music lounge, Auditorium, Worship house

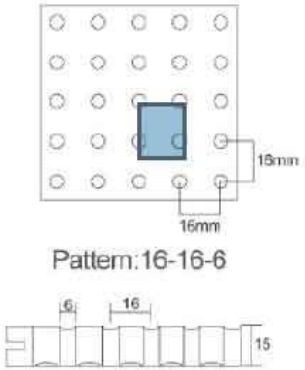
Description	Value
Surface Density	8.5 kg/m^3
Material	MDF
Front Finish	Melamine
Back Finish	Unfinish + Acoustics Felt
Length	1200mm / 600mm
Width	600mm
Thickness	12mm
Fire Rating	No
Eco Friendly	No
Color	See Color Table
NRC Perfowood 881	0.44
NRC Perfowood 16166	0.66
Country of Origin	China

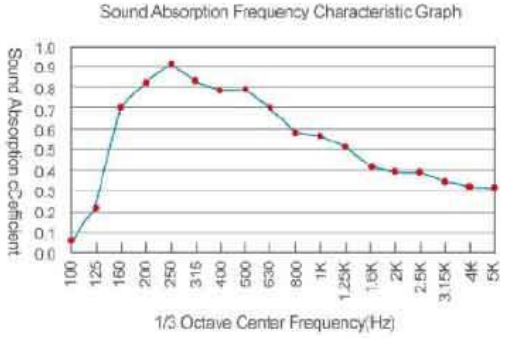
ACOURETE PERFOWOOD












ACOURETE PERFOWOOD
at Keuskupan Agung, Palangkaraya


ACOURETE PERFOWOOD
at Papillon Restaurant


ACOURETE PERFOWOOD
at Auditorium Plaza Mandiri

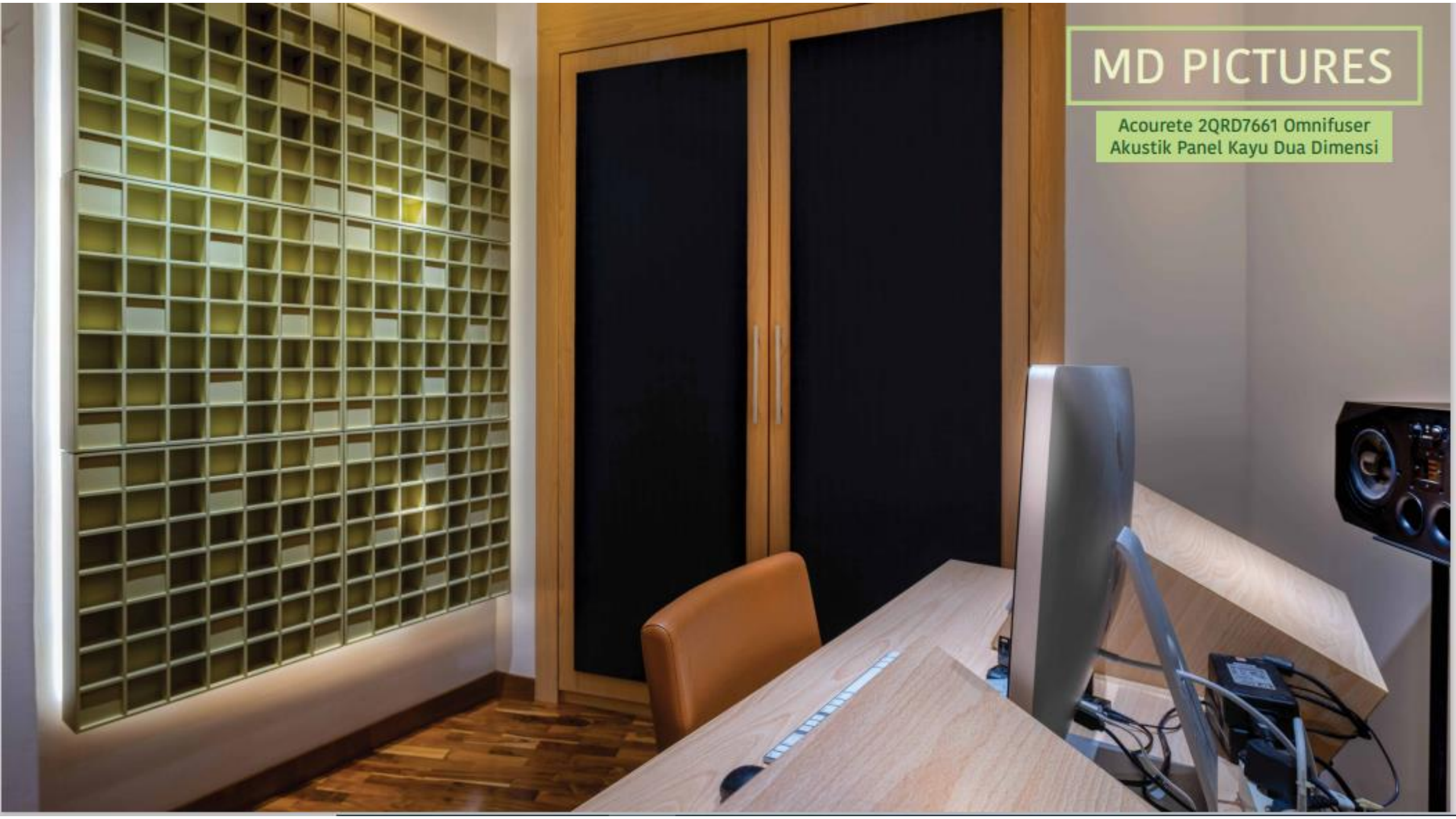
Diffuser and other architectural acoustic materials.

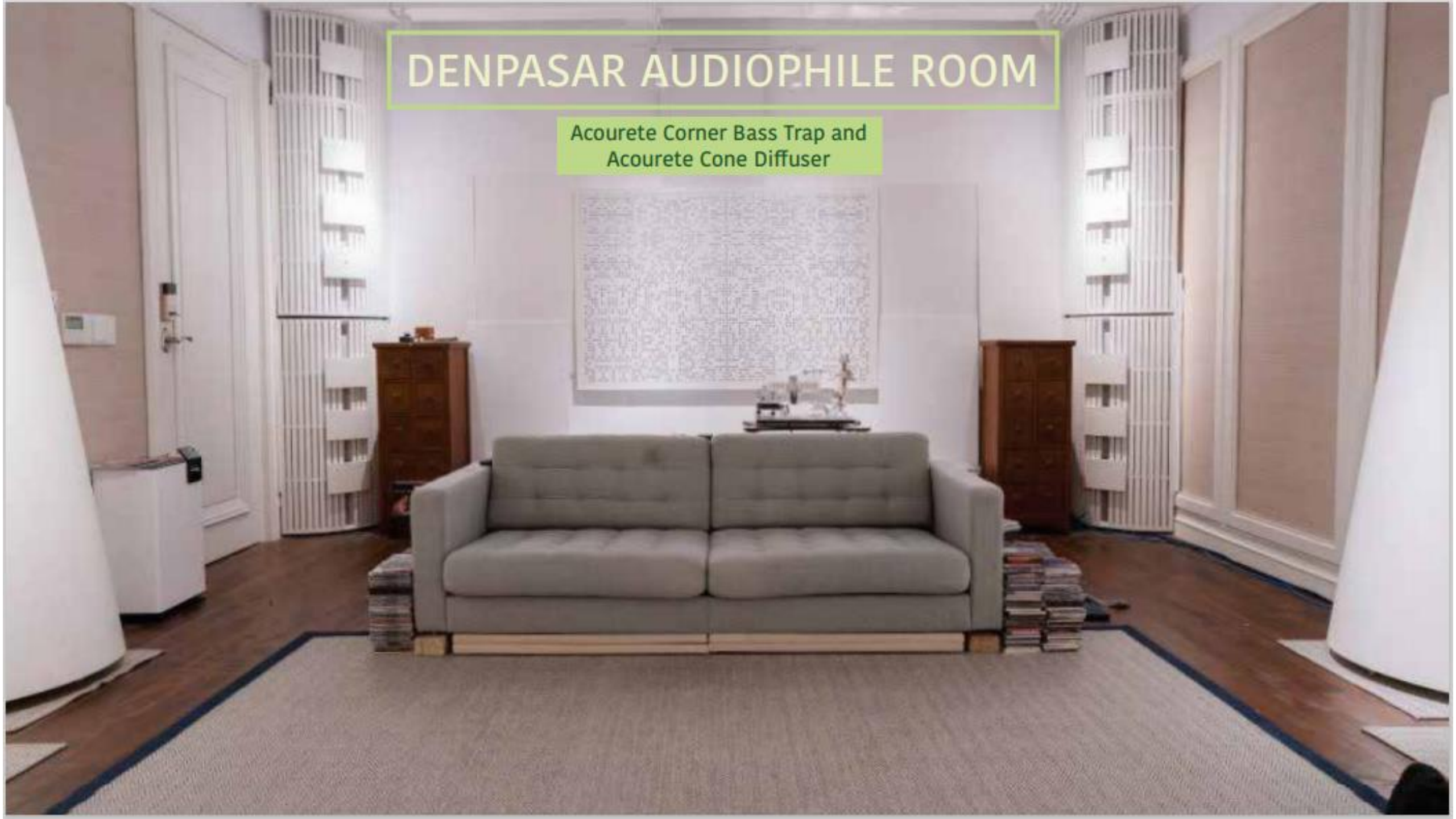
Diffuser QRD 1D

Diffuser QRD 2D

Corner basstrap


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


ACOURETE DIFFUSER QRD 1D
at Family Home Theatre, HALLING
#REVOLUTIONARYMOVEMENT


bitly

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Fax : +62 21 3458143
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