Easy acoustic system

SonoCalm

Product Catalogue

Easy Acoustic System

Special EVENT SALES

202310

ACOUSTIC NO DECOR

We fulfill the acoustic environment by creative ways, complying strict acoustic standards and manufacturing technique from products design and production to solutions putting forward. We fulfill acoustic requirements from AV room, instruments playing, studio recording, office meeting room, classroom, catering & entertainment, commercial & household easily. We renovate uncertainty of meeting acoustic standards and quality defects from traditional decoration. Our solutions cater to the pickiest ears. We suit for all types of interior decoration, easy to install on ceilings or walls. With the help of computer calculation and acoustic analysis, the acoustic product has been continuously developed and improved. The features and actual application of the product are optimized based on the test data, making the product further improved toward perfection. The product is a combination of artistic appearance, quality, high efficiency and personalized design. The product can meet high end requirements. We are SonoCalm, an extraordinary example in the acoustic world.


Living room


Office


Home theater


Audio studio

03 **EQ** Walleasear

EQ30/60/120T W-absorber
EQ50R Rococo
EQ50B Baroque
EQ50Q Versailles
EQ2 Mirage
EQ3 Phantom
EQ4 Cobble
EQ5 Geometric



19 **EQ** Basstrap

EQ101A/B
Cylinder Basstrap

EQ102A/B
Corner Basstrap



21 **Imagine** Acoustic Panel

Imagine Acoustic Panel

Imagine Acoustic Magic



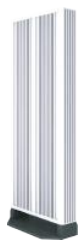
29 **DQ** Series

F300H High frequency absorber
F300M Medium frequency absorber
F300W Low frequency absorber
F300D Full band frequency diffuser
R300W/R350W Cylinder basstrap
C300W/C350W Corner basstrap



35 **AQ** Intelligent Modularity Easeapps

AQ1000S	Acoustic Baffle
AQ1000SL	Haydn Acoustic Array
AQ1000SW	Bach Acoustic Array
AQ1000M	Smartfuser
AQ1000H/HD	Movable Acoustic Baffle
AQ150W	Movable Acoustic Baffle



41 **QRD** Two-dimensional Diffusion Easeapps

D64 Chessfuser
D30/30S Quadrifuser
N8 Octofuser
N29 Metafuser
D80 Fuseaser
D80W Trapfuser
D60 Trifuser
D60W Trapfuser

51 **MLS** Three-dimensional Diffusion Easeapps

PEAK 5Q Diffuser
CLOUD 2C Diffuser
ARC 300W Basstrap
ARC 300 Diffuser
WAVE 600 Diffuser
PEAK 2000D&A/D Diffuser
PYRAMID 4Q Diffuser



61 Technical Reference

Application Reference
Room acoustic environment analysis
Room Mode
Soft diffusion
Architectural Acoustics
Halls sound environment
Theater sound environment
Studio design reference
How to decrease effect of standing wave
Listen to the sounds of environmental technology
HIFI stereo set a reference model
Factors of Small AV Room Acoustics
Speakers Location Demo



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Name: W-absorber

Mosdel: EQ30 EQ60 EQ120 (Angle T / Chamfer TD)

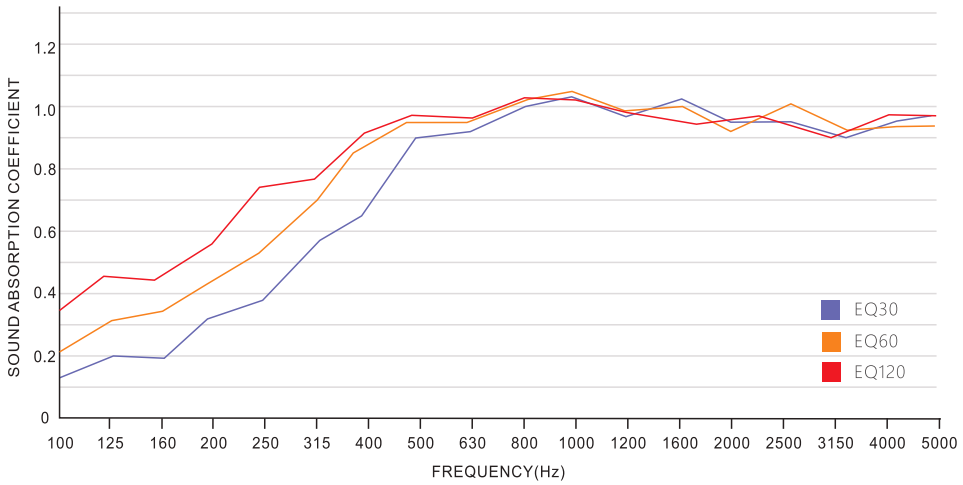
Base Material: 100% eco-friendly acoustic composite fiber wool

Finish: SF-series, UA-series, YC-series, XY-series fabric acoustic cloth surface finishing

Eco-Friendly: Zero Formaldehyde emission; Enf standard

Specification: Refer to standard specifications (non-standard customized quantity ≥ 10m²)

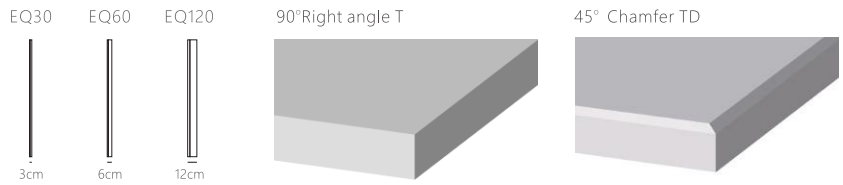
Weight: EQ30≤4.8Kg/m², EQ60≤7.0Kg/m², EQ120≤13.0Kg/m²



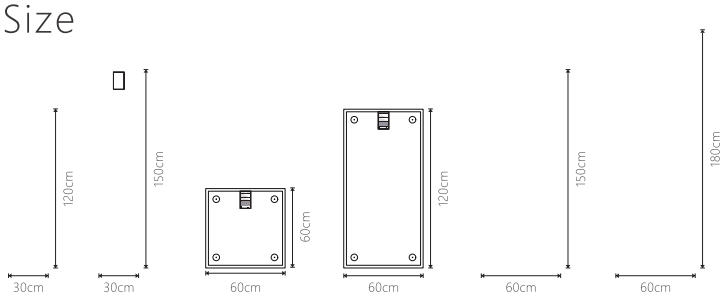
- Since our product is designed in modular form, we can configure it different combinations and able to strike a balance between space aesthetics and acoustic.
- Walleasear able to absorbs sound in all frequency, being able to form either a diffusing wall or low frequency trap easily.
- To control main reflections in strong energy by forming a broadband frequency absorbing wall
- Its double bandwidth suits with broadband frequency sound absorber and to accompany a surface in the ratio of 1 (Absorption):1(Diffusion)
- For broadband frequency acoustic treatment in different spaces
- In unbalanced spaces, it helps to set up a balanced absorbing surface via customizing into different sizes.
- This is the perfect acoustic treatment for you to control the sound with easily installed system and will not influence the natural sound atmosphere you preferred.

Depending on your application, we can arrange the panel in different arrays, e.g. studios, halls, small conference rooms, entertainment rooms and classrooms. Panels are usually flush mounted in different cluster, so that energy will not be reflected repetitively. In this way, they help to control sound waves by maximizing the absorption efficiency. SonoCalm 'Walleasear' is designed to be a combination on large wall surfaces with random spacing, called second diffusion panel after soft diffusion. In the space between the reflection panel, some energy is absorbed, while others is reflected back the space. Under this path, controlling fluttering echo and standing waves are much better. At the same time, we reserve the sense of space in those rooms. SonoCalm 'Walleasear', an easily installed solution and able to preserve a natural acoustic ambiance. The best choice for solving ceaseless echoes in home theaters, SonoCalm 'Walleasear', save your cost in reverberation time controlling for small spaces, such as studios, instrument practicing rooms and HIFI rooms,

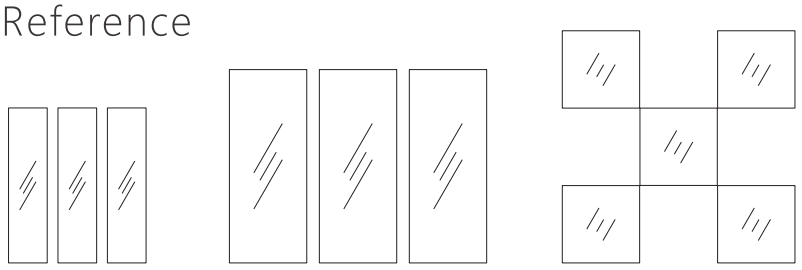
Model

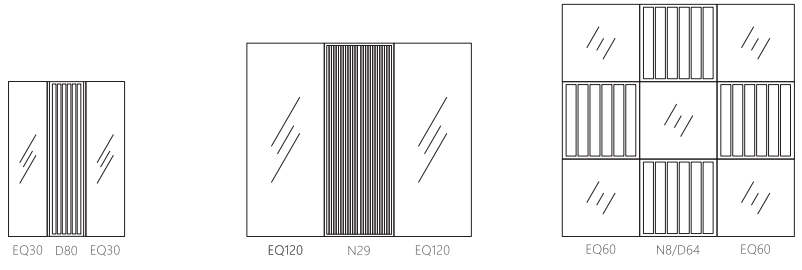


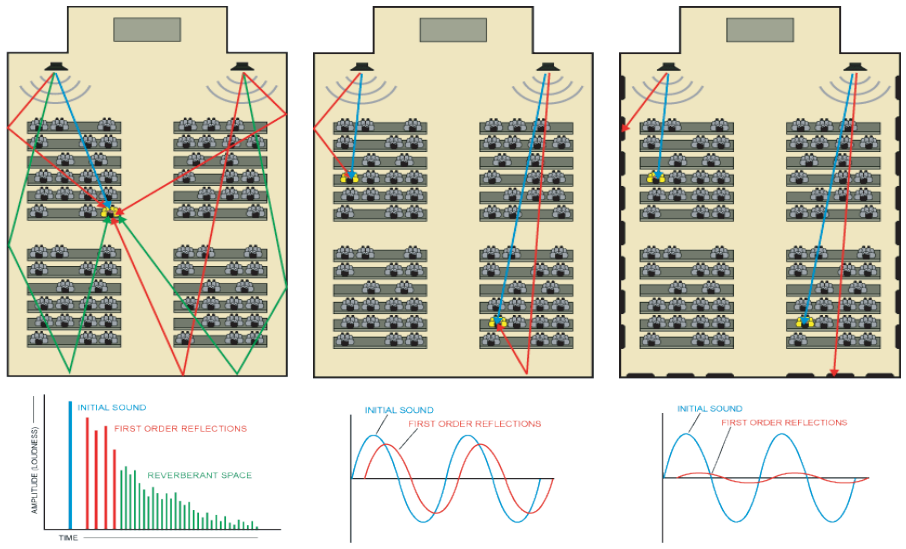
Size



Reference





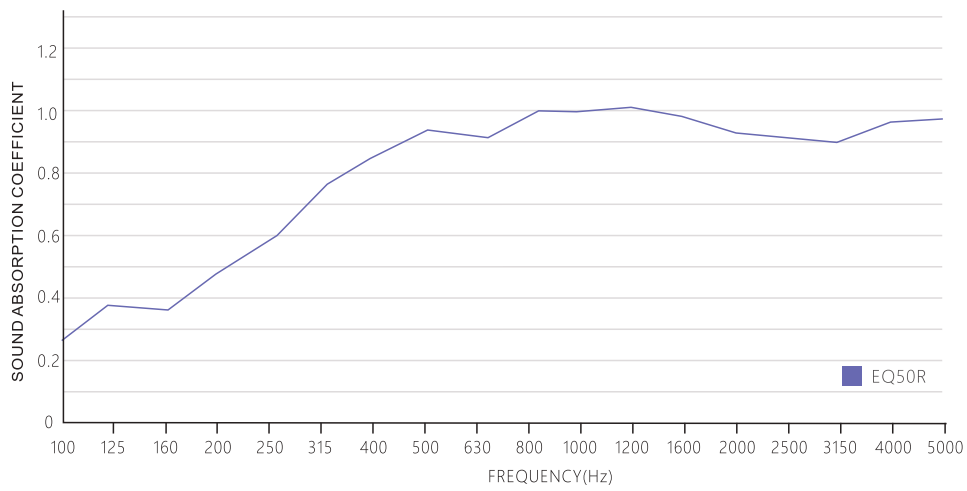








Name: Rococo
Mosdel: EQ50R
Base Material: ECO-friendly composite acoustic wool of different density
Finish: SF-series, UA-series, YC-series fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard specifications (non-standard customized quantity ≥ 10m²)
Weight: ≤5Kg/m²

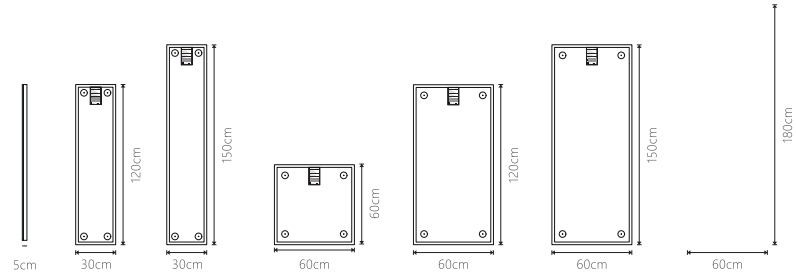


• Easy-to-install acoustic treatment solution that effectively controls the largest primary reflection in sound waves.
• Using high-density natural micro-porous fiber environmentally friendly acoustic cotton, the composite inner structure conforms to the acoustic index.
• Combined with the large absorption surface area of the broadband tuning plate, it can effectively improve the sound absorption in reverberation and acoustic echo generated by a large sound pressure level.
• The variety of combined limitation methods perfectly cover the sound reference wall, absorb a large amount of reflected sound waves, and reshape the natural atmosphere of the hall. It is especially suitable for the high-revolution of the acoustic echo, ven in large spaces with broadband attenuation and reverberation.

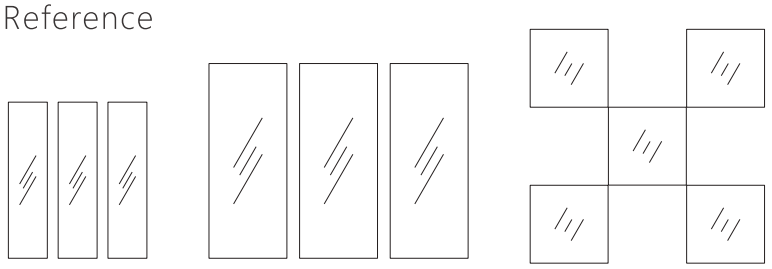
The Rococo style first appeared in decorative arts and interior design. Compared with the early Baroque that the later neoclassical Rococo reflected the intertwined atmosphere of social pleasure, luxury and love at that time, and added a lot of exotic figures in the creation. Elements. The overall characteristics of Rococo are brisk, gorgeous, delicate, delicate, cumbersome, slender, and soft, which is flat and slender beauty, delicate and charming, complicated and delicate, delicate and elegant, sweet and gentle, harmonially emphasizes symmetry in the composition, and rhythmically structure and linear are tactful and soft.

Our product can produce a good tuning tool for your room reverberation time, eliminating fluttering echo and standing waves, while preserving beneficial reflection through scattering, but also helps to solve the problem of over absorption, keeping the sense of fullness and space. Our products are a result of closely knit responsibility towards architectural design, geometrical shapes and aesthetic factor.

Size



Reference

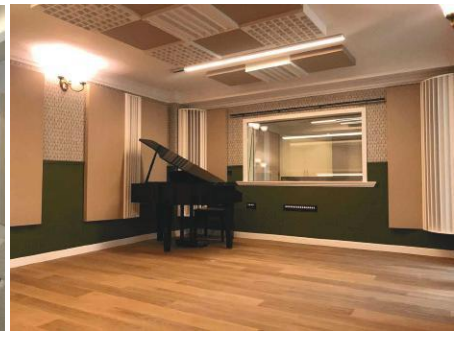
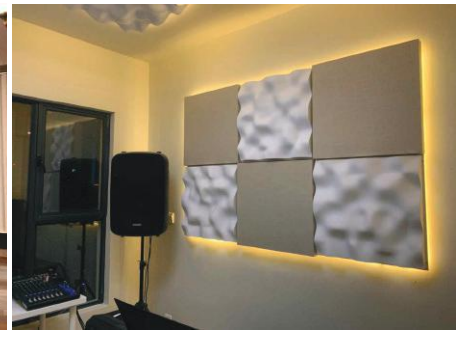




E



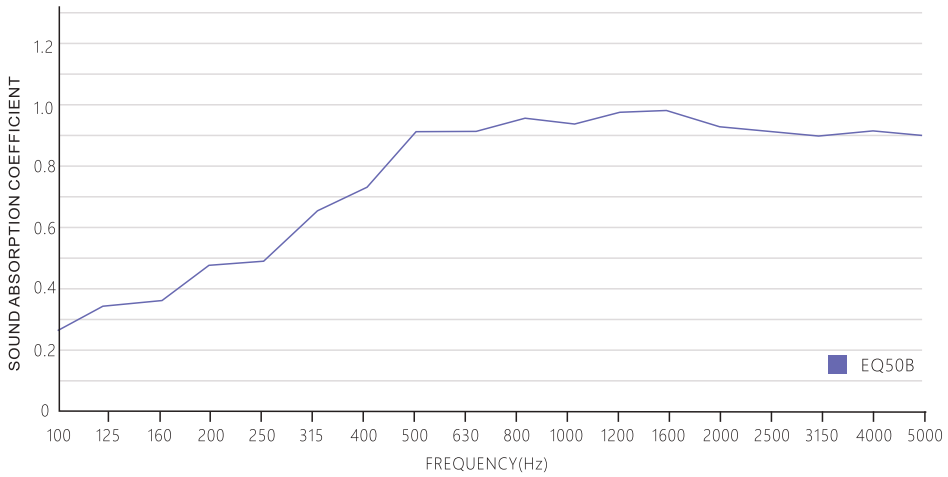







Name: Baroque
Mosdel: EQ50B
Base Material: 100% eco-friendly acoustic composite fiber wool
Finish: SF-series, YC-series fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Enf standard
Specification: Refer to standard specifications (non-standard customized quantity ≥ 10m^2)
Weight: ≤5Kg/m^2

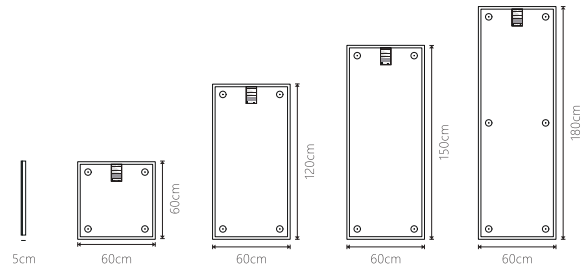


• Our product integrates mixed density acoustic linen and high density porous green wool in an slightly internal structure.
• Since our product is design in modular form, the combination is diversified and suitable for solving the broadband frequency in large space. With highly effective absorption capability, our product will transform your listening experience with natural high-resolution.
• 3D absorbing structure on the surface helps Walleasear to solve reverberation generated from great sound pressure and superposition arising therefrom.
• By extending our encounters to the best cavity, we can increase the absorption frequency spectrum by one octave (50Hz) at the lowest. Transforming it into a low frequency trap that can handle vast ranges of audio.

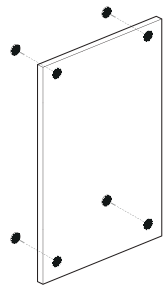
Baroque's philosophy is deeply affected by Renaissance thought, which is based on the idea of romanticism, the style of Baroque is filled of luxurious decoration with a space temperament. It shows the character of religion and hedonism at the same time by heighten an open and passionate living atmosphere. After Baroque decade, Classical musicians tended to simplify and standardize musical language. In other words, diversification and change are the soul of Baroque art.

Our product can produce a good tuning tool for your room reverberation time, eliminating fluttering echo and standing waves, while preserving beneficial reflection through scattering, but also helps to solve the problem of over absorption, keeping the sense of fullness and space. Our products are a result of closely knit responsibility towards architectural design, geometrical shaping and aesthetic factor.

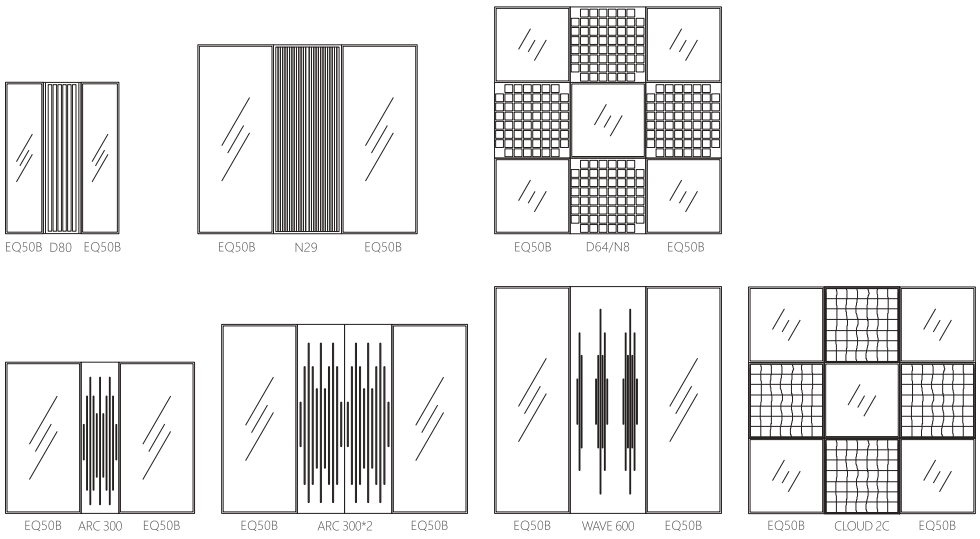
Size



Installation guidelines

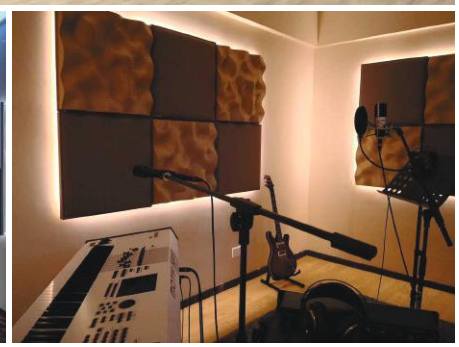


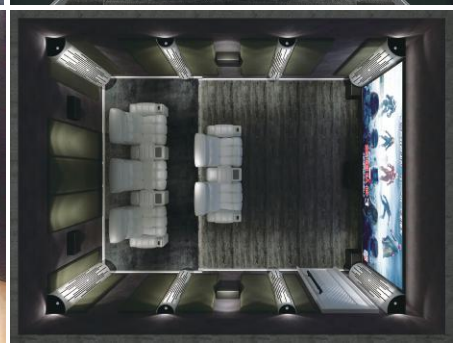
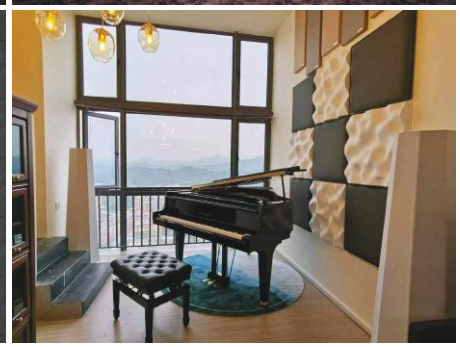
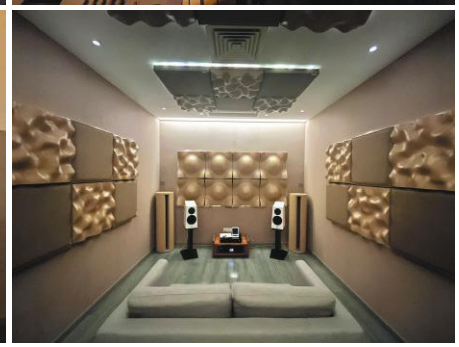
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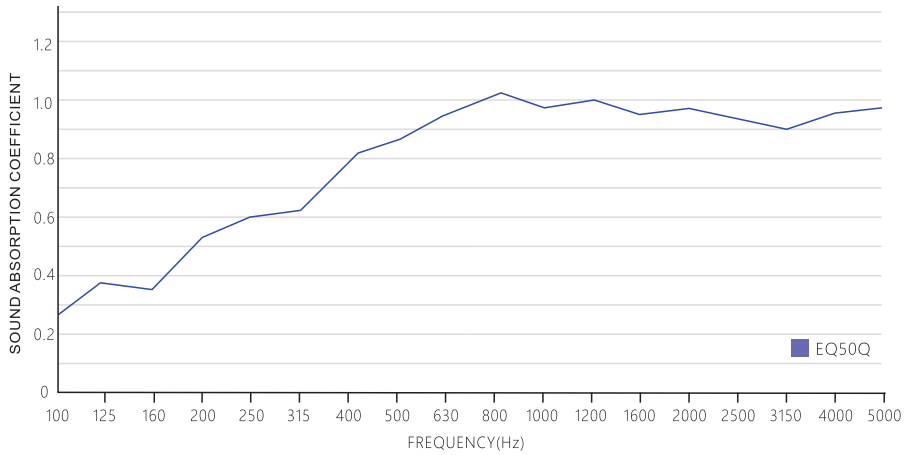




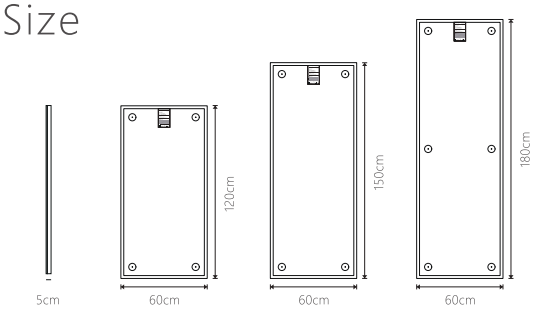
Name: Versailles
Mosdel: EQ50Q
Base Material: Purely natural green fiber acoustic wool
Finish: SF-series, YC-series fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard size (not accept customized size)
Weight: ≤5Kg/m^2



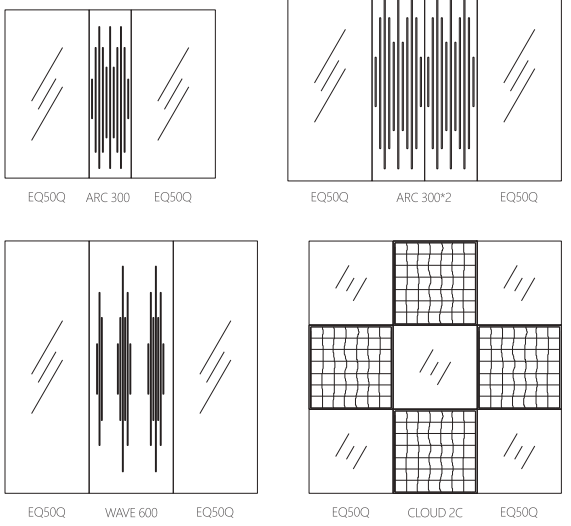
- Our product shows not only excellent acoustic characteristics, but also the organic combination of art and technology.
- Integrate into the spaces easily to achieve diverse spatial acoustic indicators.
- Easy to build a broadband absorption wall to control the powerful main reflection.
- A variety of standard specifications and size customization, suitable for the establishment of equal acoustic absorption in different spaces.
- Standard sized one suits to create a wall for main reflection and to form a surface in the ratio of 1(Absorption):1(Diffusion).
- Other optional size is available for setting up a balanced absorbing surface e.g. church, hall, entertaining room, office, house, studio, private cinema etc.

'Versailles' are finished with random crack convex surface, which forms plenty different absorber to eliminate broader frequency spots, medium frequency fluttering echoes and low frequency standing waves. In this way, it helps effective control for oscillation between sound reflection source and listener. 'Versailles' is an easy-to-install and yet effective solution. Installation: Usually, 'Versailles' is flush mounted on walls together with diffusers so that it will maximize the potential of beneficial reflections. Here we had eliminated the dilemma of acoustic controlling and full sense of a room keeping. 'Versailles' is suitable to solve main reflection on medium sized spaces like home cinema, studio and entertaining room. Our products are a result of deeply felt responsibility towards architectural design, geometrical shaping and aesthetic factor.

Size



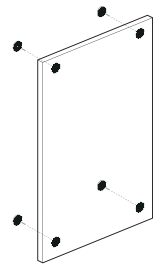
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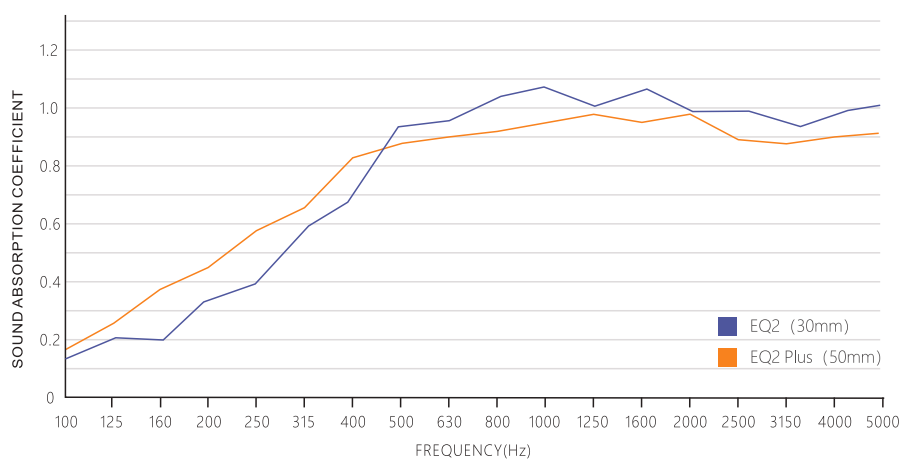
Installation guidelines







Name: Mirage
Mosdel: EQ2.1 / EQ2.2 / EQ2.3 / EQ2.4(Plus)
Base Material: Purely natural green fiber acoustic wool
Finish: UA-series, 14 series,SF-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard specifications (non-standard customized quantity ≥ 15m²)
Weight: ≤6.3Kg/m²



COLOR



- The flat soft surface is the perfect "companion" for hard walls, which can effectively prevent sound reflection and reduce reverberation time.
- Four-layer non-equivalent density composite base material, it is conducive to enhancing the absorption of sound energy in a wider frequency band and forming a strong sound-absorbing wall.
- Unique closed acoustic cavity design to increase the absorption of low-frequency residual sound energy.Patented aluminum frame structure to ensure maximum absorption surface area and acoustic performance. Zero formaldehyde emission, E0 standard environmental protection base material, to ensure the safety of the sound environment.
- Application : office, conference room, reception space, leisure room, home cinema, studio etc

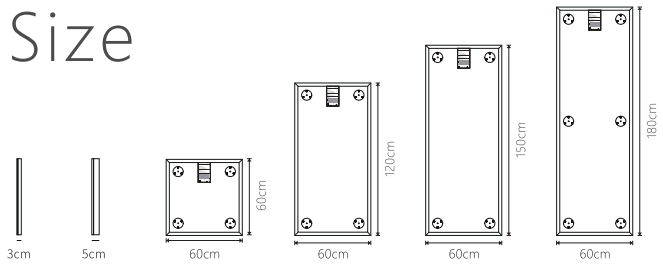






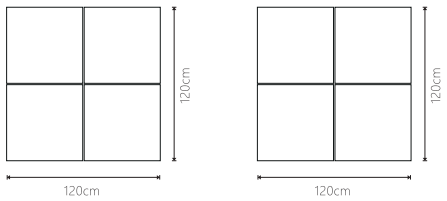
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Size



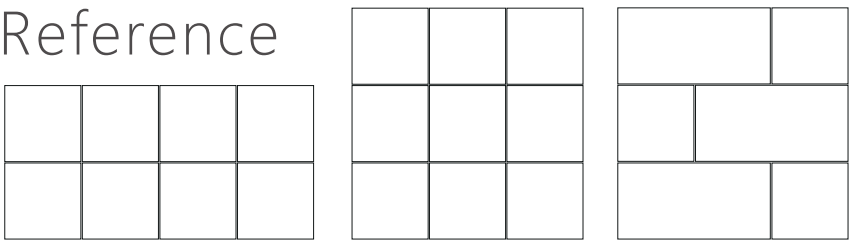
EQ2 EQ2 Plus EQ2.1 EQ2.2 EQ2.3 EQ2.4

Package



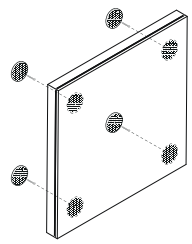
EQ2.0-P1 EQ2.0 Plus-P1

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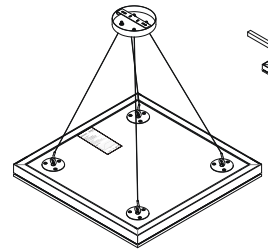




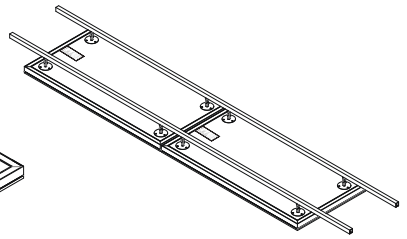
Installation guidelines



壁掛方式
Hanging installation diagram



單片吊裝
Hanging installation diagram



陣列吊裝
Hanging installation diagram

PACKAGE



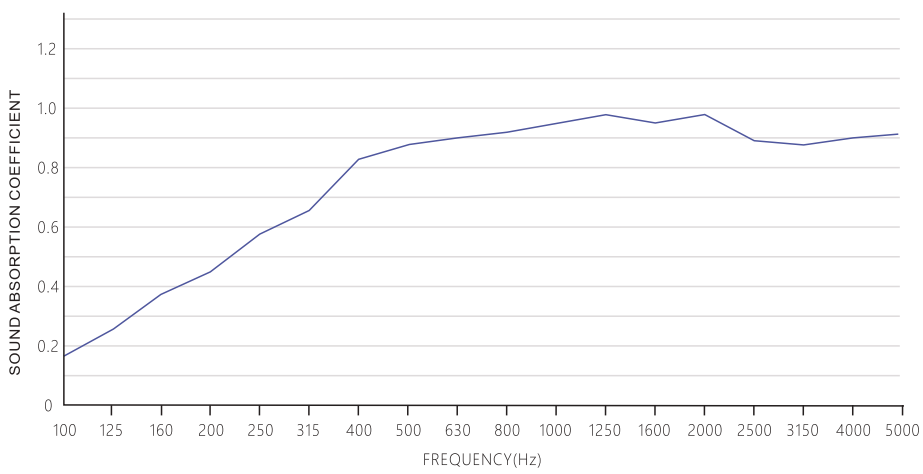
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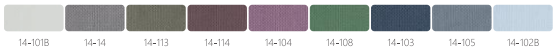
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Name: Phantom
Mosdel: EQ3.1 / EQ3.2 / EQ3.3 / EQ3.4
Base Material: Purely natural green fiber acoustic wool
Finish: 14 series, SF-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard specifications
Weight: EQ3.1≤3.4Kg, EQ3.2≤4.7Kg, EQ3.3≤5.9Kg, EQ3.4≤12Kg



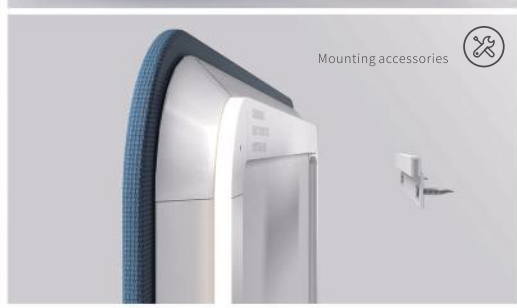
COLOR







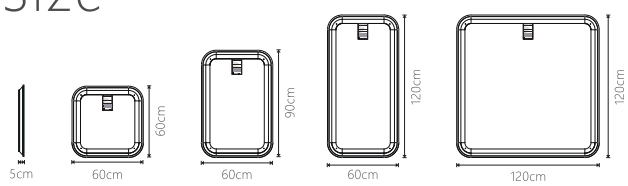




- The "phantom" is a combination of rigorous acoustics and technology aesthetics.
- Quickly control the main reflected waves on the wall, it improves the language intelligibility effectively.
- Unique rear acoustic cavity design to increase the absorption of low-medium frequency residual sound energy.
- Streamlined steel structure, optional side lighting background ambient light, make the acoustics without losing the aesthetics.
- The combination of magic methods provides infinite fantasy space, and arbitrarily builds an absorbing wall that integrates into the environment.
- Zero formaldehyde emission, E0 standard environmental protection base material, to ensure the safety of the sound environment.
- Application: office, conference room, reception space, leisure room, home cinema, studio etc

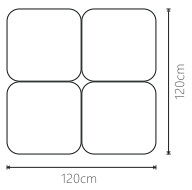
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Size



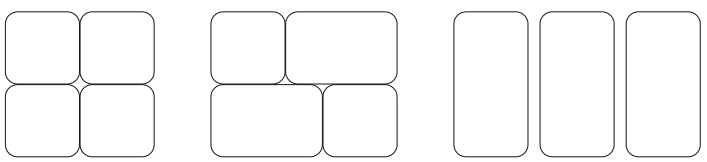
EQ3.1 EQ3.2 EQ3.3 EQ3.4

Package

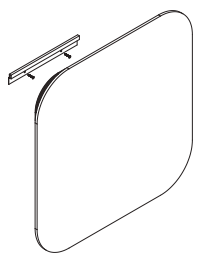


EQ3.0-P1

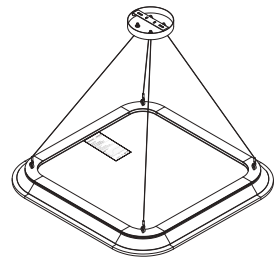
Reference



Installation guidelines



Hanging installation diagram



Hanging installation diagram

PACKAGE



14-0104



14-1401



14-0105



14-0103



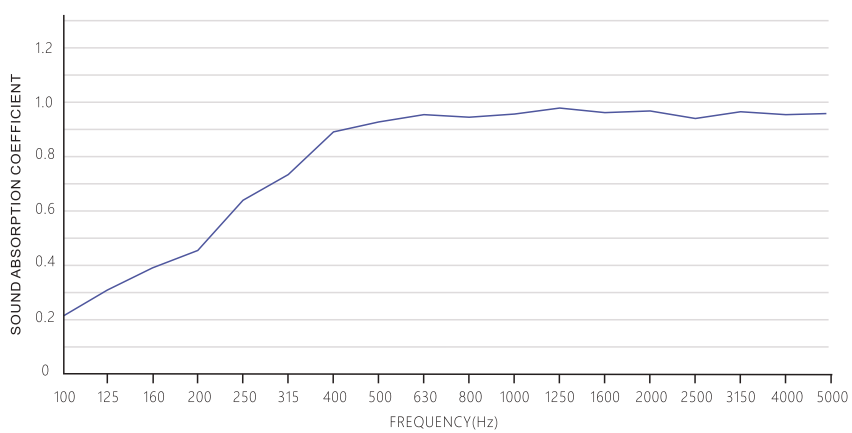


Name: Cobble
Mosdel: EQ4.1 / EQ4.2 / EQ4.3/ EQ4.4
Base Material: Purely natural green fiber acoustic wool
Finish: SF-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard specifications
Weight: EQ4.1≤0.43Kg, EQ4.2≤0.65Kg, EQ4.3≤1.09Kg, EQ4.4≤3.57Kg

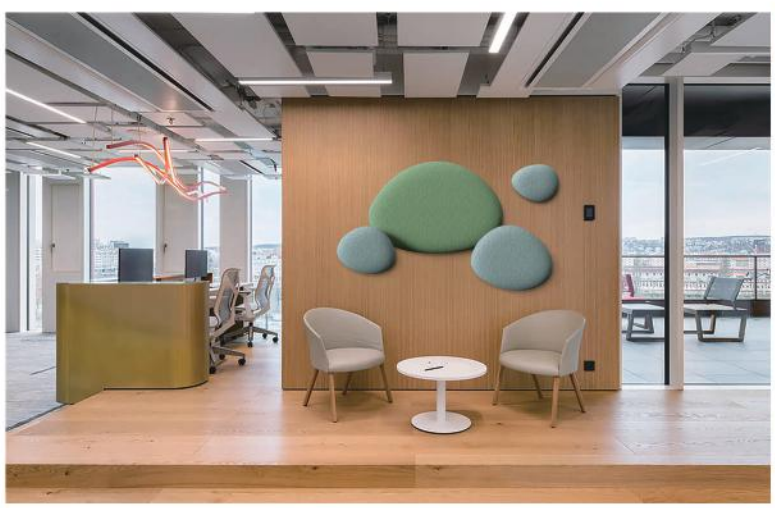
COLOR







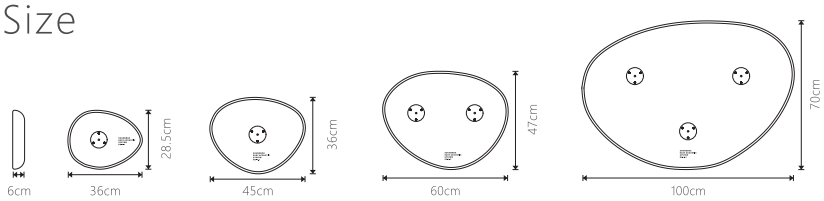
- It not only offers well performed acoustical function with aesthetics, but also deliver a perfect combination when it is applied into different spaces with design.
- The installation is easy with standard anti-oxidization and anti-resonance treated aluminum fixing system.
- Powerful broadband absorption performance can easily build a professional sound-absorbing surface.
- Flexible and free combination with acoustic solutions, covering the main reflection surface and reducing the spatial reverberation phenomenon.
- Application : Home, office, conference room, reception space, leisure room, home cinema, studio etc



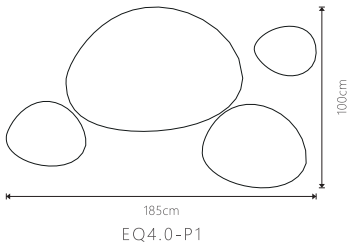


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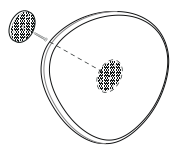
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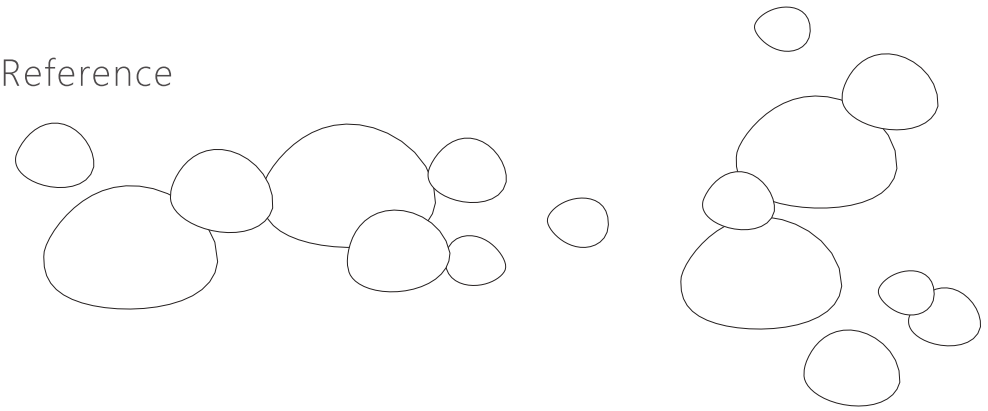
Package



Installation guidelines



Reference











PACKAGE


Sf1202


Sf0212


Sf1209


Sf0912


Sf3412


Sf1234


Sf3417


Sf1734


Sf3400


Sf0034


Sf3437

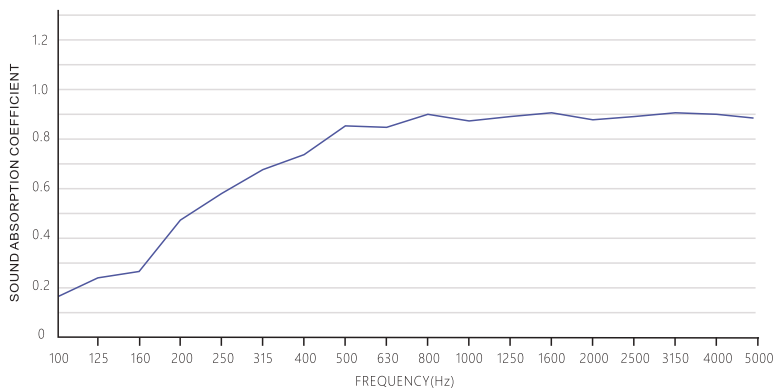

Sf3734


Sf3423


Sf2334



Name: Geometric
Mosdel: EQ5.1Q / EQ5.2Q / EQ5.1R / EQ5.2R
Base Material: Purely natural green fiber acoustic wool
Finish: SF-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Up to Enf standard
Specification: Refer to standard specifications
Weight: H600≤1.96Kg, H900≤3.64Kg, R600≤1.52Kg, R900≤2.92Kg

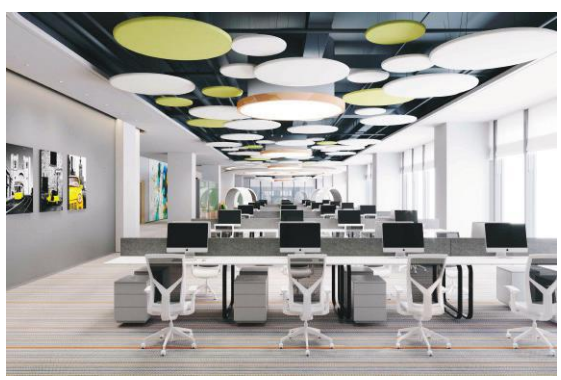


COLOR



- There are rules and regulations, self-contained.
- Rigorous functional data, easy to meet space acoustic standards.
- 6-years developed experiences, the combined material can absorb the broadband frequency perfectly.
- The installation is easy with standard anti-oxidization and anti-resonance treated aluminum fixing system and easy to build the acoustic environment.
- E0 standard eco-friendly standard with safety guarantee
- Application : office, conference room, reception space, leisure room, home cinema, studio etc

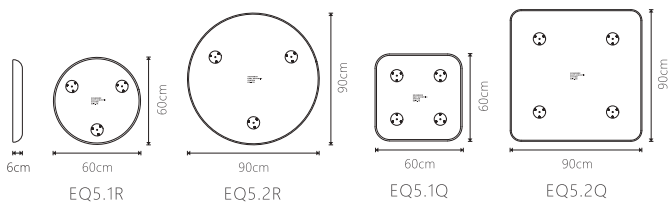




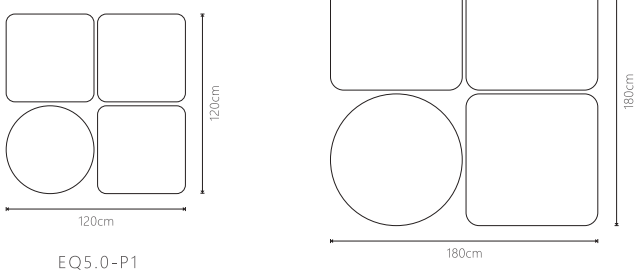


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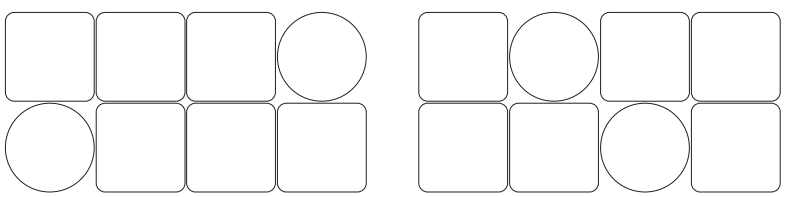
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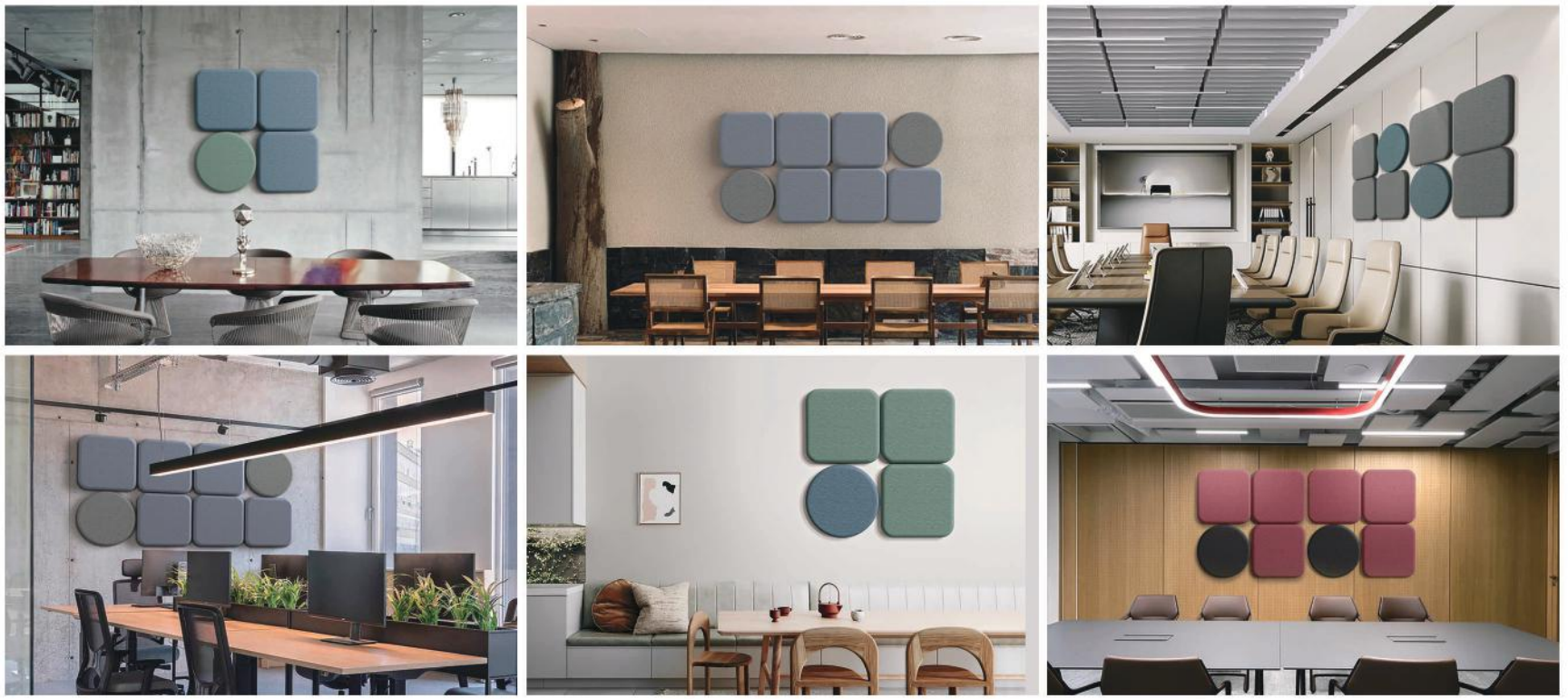


Package

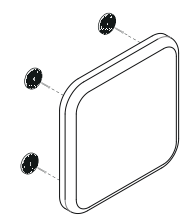


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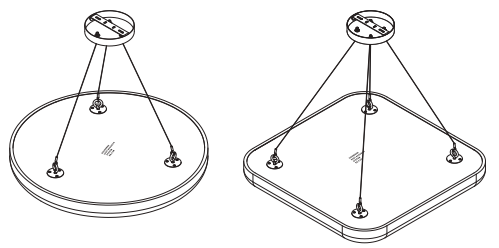




Installation guidelines

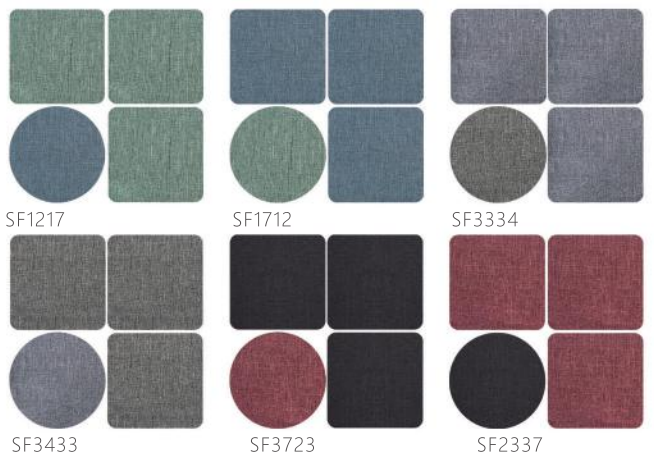


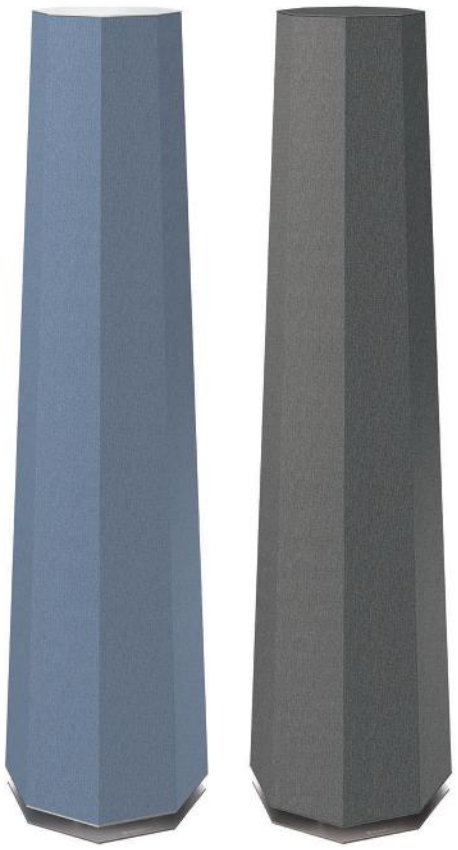
Wall mounting installation diagram



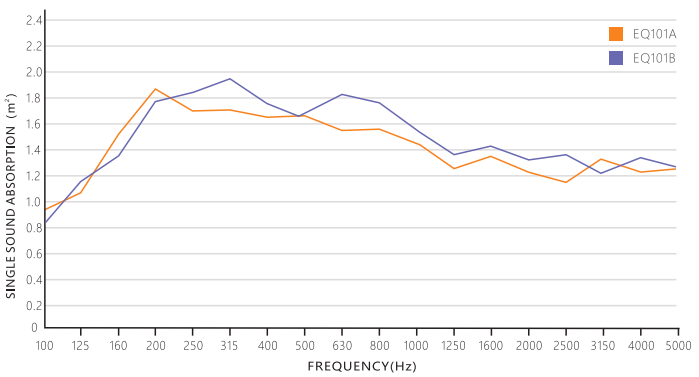
Hanging installation diagram

PACKAGE





101A 101B



Name: Cylinder Basstrap
Mosdel: EQ101A((Built-in Helmholtz resonator)) / EQ101B(Withou Built-in Helmholtz resonator)
Base Material: ECO-friendly composite acoustic wool of different density
Finish: SF-series, 14-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Meet the international E0 standard
Size: H1500*W400*D250mm
Weight: EQ101A: ≤12.6Kg EQ101B: ≤12.7Kg

Acoustic structure: The eight-sided cone absorbing device and asymmetric volumetric structure can create a more advantageous broadband absorption cavity. The cylindrical 360-degree sound-absorbing surface absorbs the margin low-frequency waves gathered at the corners. Of course, the SonoCalm engineers have prepared the "A" option with a built-in Helmholtz resonator for you who are looking for higher spatial sound indicators, which better absorbs the 63Hz that is not liked by sound recordists and burners, even if the presence of these frequencies is not of public interest. The Cylinder Basstrap acts on the absorption of low frequencies, and matches the EQ50R and other walleasear sound absorption panels perfectly, which is a perfect combination for building a high-quality sound environment in a small space.

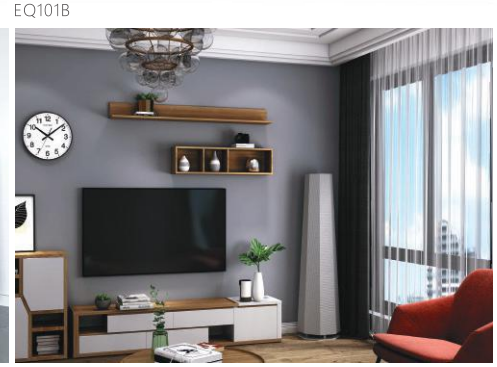


EQ101A



EQ101B



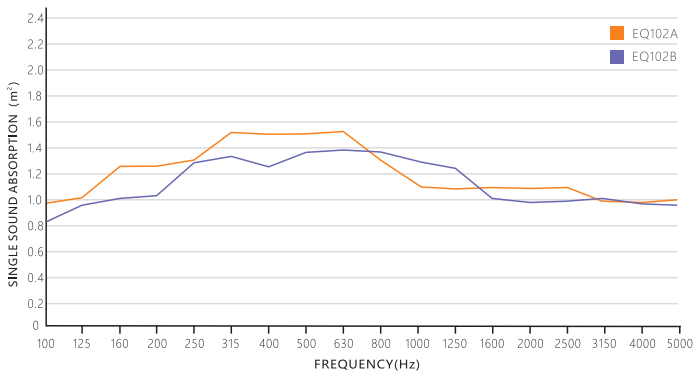


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102A 102B





Name: Corner Basstrap
Mosdel: EQ102A((Built-in Helmholtz resonator)) / EQ102B((Withou Built-in Helmholtz resonator))
Base Material: ECO-friendly composite acoustic wool of different density
Finish: 14-series, SF-series, fabric acoustic cloth surface finishing
Eco-Friendly: Zero Formaldehyde emission; Meet the international E0 standard
Size: H1500*W400*D250mm
Weight: EQ102A: ≤15Kg EQ102B: ≤15.3Kg

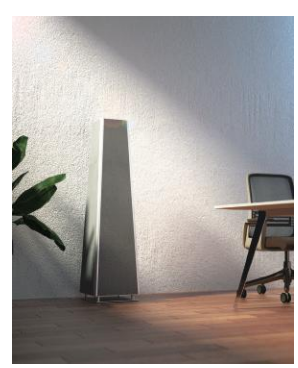
Acoustic structure: The Four-sided trapezoidal strong absorbing device, asymmetric volumetric structure acts to create a more advantageous broadband absorption cavity. The cylindrical 360-degree sound-absorbing surface absorbs the margin low-frequency waves gathered at the corners. Of course, the SonoCalm engineers have prepared the 'A' option with a built-in Helmholtz resonator for you who are looking for higher spatial sound indicators, which better absorbs the 63Hz that is not liked by sound recordists and burners, even if the presence of these frequencies is not of public interest. The Cylinder Basstrap acts on the absorption of low frequencies, and matches the EQ3.0 and other walleasear sound absorption panels perfectly, which is a perfect combination for building a high-quality sound environment in a small space.



EQ102A

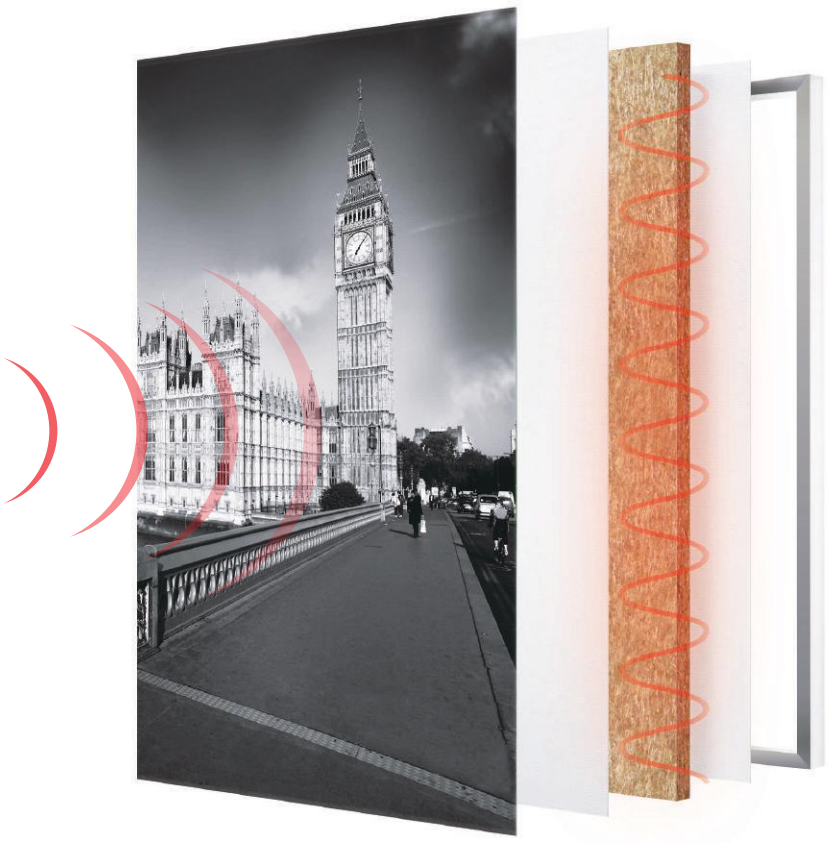


EQ102B

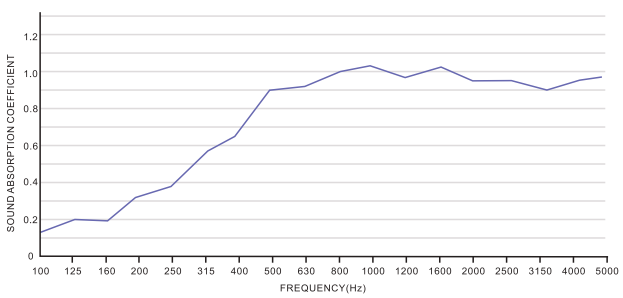




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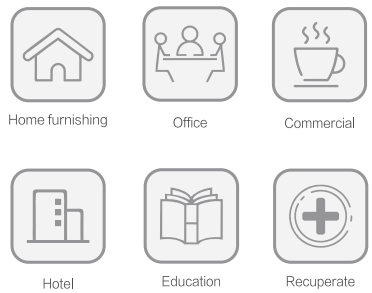


Imagine acoustic painting is a natural acoustic cotton substrate made of natural plant ultra-fine fiber as raw material, mixed with 3% PET polyester fiber, and made of 280 degree high temperature and without glue heat compound. The substrate is double-sided with a 100% PET ultraporous acoustic trunk with a large number of unequal radius pores connected to each other, the pores are deep inside the structure, and the internal and external unequal orders of air layer constitute a wide frequency absorber. The layer of the substrate is also a good acoustic energy sealing structure, and the sound wave penetrates the surface layer to the ultra-micro-long radial pore, and the friction between the substrate material and the material converts the acoustic energy into heat energy, realizing the multi-stage reflection sound and noise that consumes excess space.

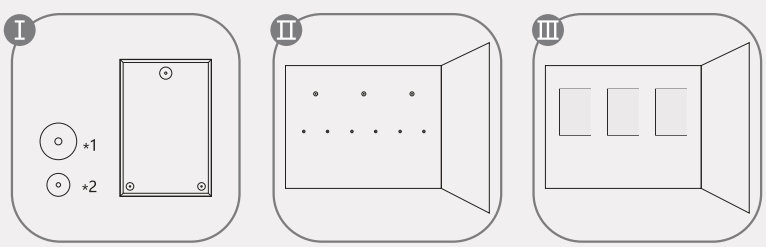








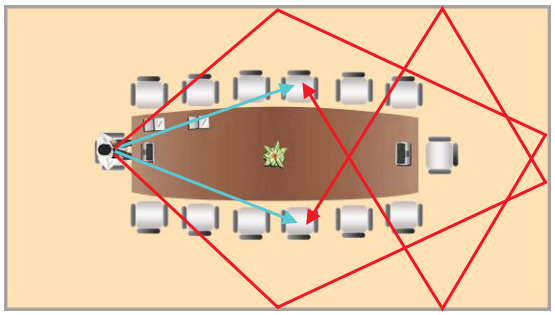
EASY INSTALLATION

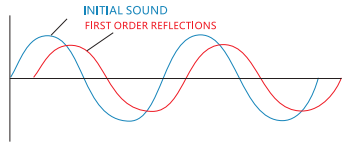


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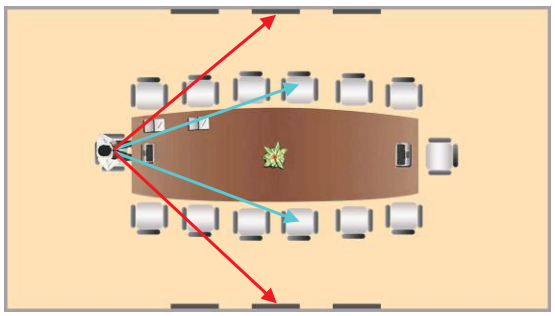


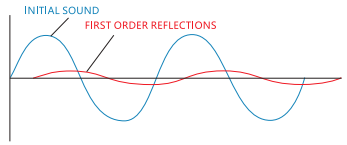






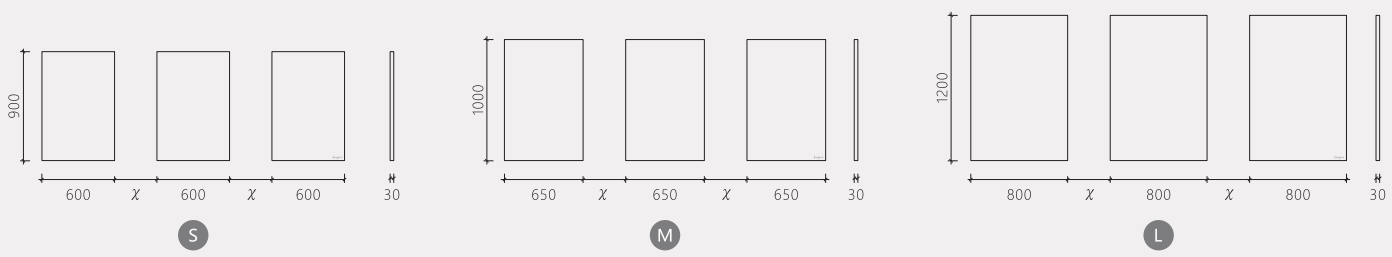
The initial direct sound (blue) overlaps with the powerful multi-order reflection sound (red) reverb. Severely interfering with the speaker linguistic clarity, such a space makes it difficult for the audience to experience the appeal of the language, especially in online meetings.





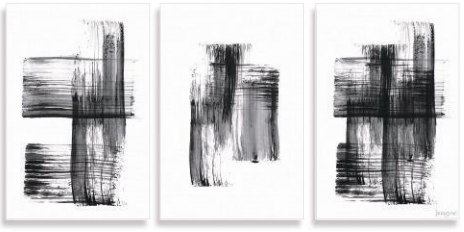
Imagine acoustic painting is installed to form a broadband wave absorbing wall, which effectively reduces the generation amplitude of multi-order reflected sound (red) in space and improves the language clarity by an order of magnitude. What's more, it has the important performance of strong absorption and elimination of background noise in space.

SPECIFICATION SELECTION






P01


P02



P03



P04


P05


P06


P07


P08


P09

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P10



P11



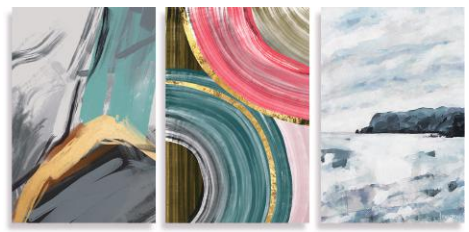
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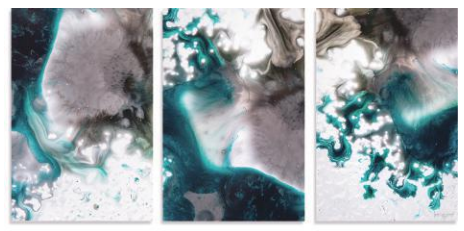
P13



P14



P15



P16



P17



P18





P19



P20



P21



P22



P23



P24



P25



P26



P27

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P28



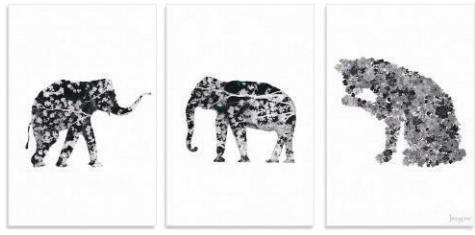
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P30



P31



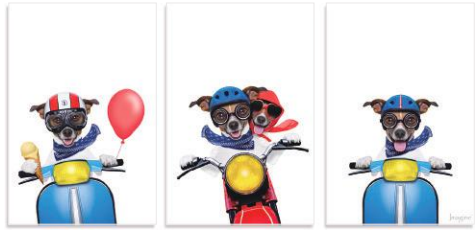
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P33



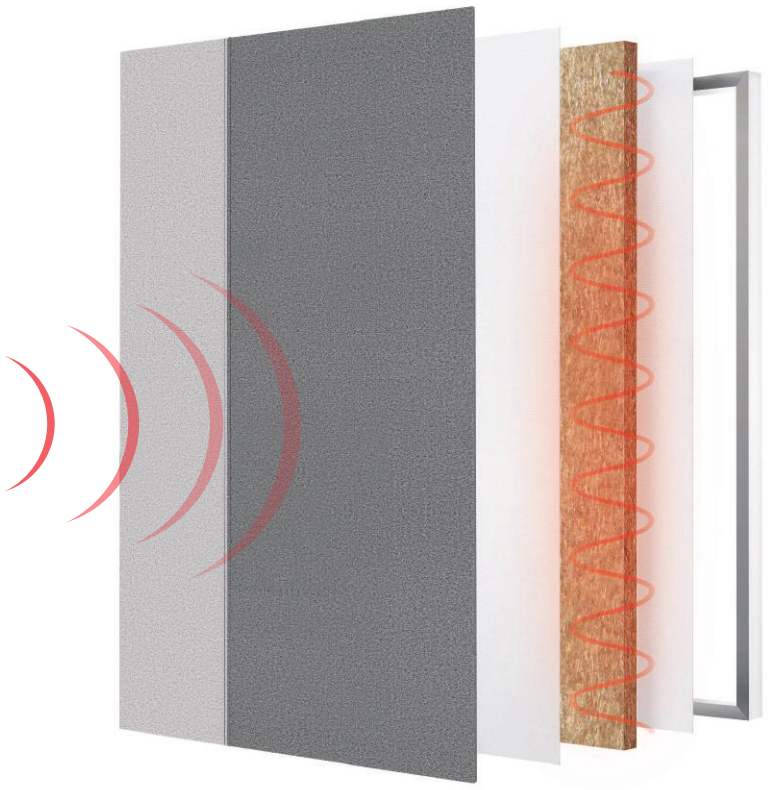
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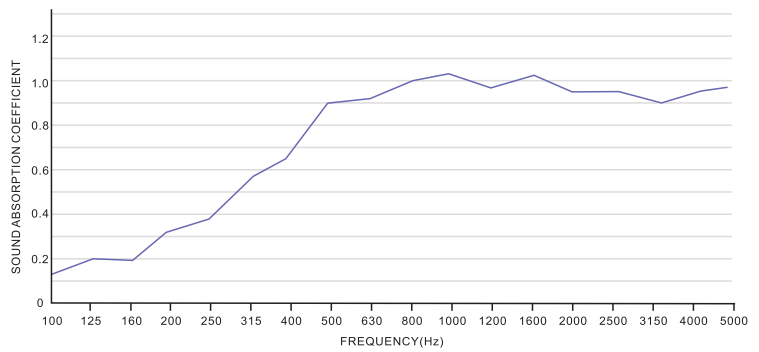
P35



P36



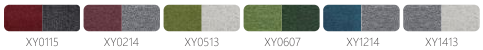
Imagine acoustic magic is a natural acoustic cotton substrate made of natural plant ultra-fine fiber as raw material, mixed with 3% PET polyester fiber, and made of 280 degree high temperature and without glue heat compound. The substrate is double-sided with a 100% PET ultraporous acoustic trunk with a large number of unequal radius pores connected to each other, the pores are deep inside the structure, and the internal and external unequal orders of air layer constitute a wide frequency absorber. The layer of the substrate is also a good acoustic energy sealing structure, and the sound wave penetrates the surface layer to the ultra-micro-long radial pore, and the friction between the substrate material and the material converts the acoustic energy into heat energy, realizing the multi-stage reflection sound and noise that consumes excess space.





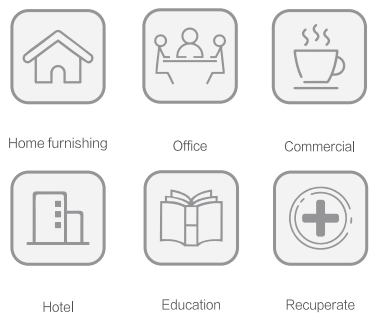
Sound absorbing | Noise reduction | Zero emission | Anti-bacteria

COLOR

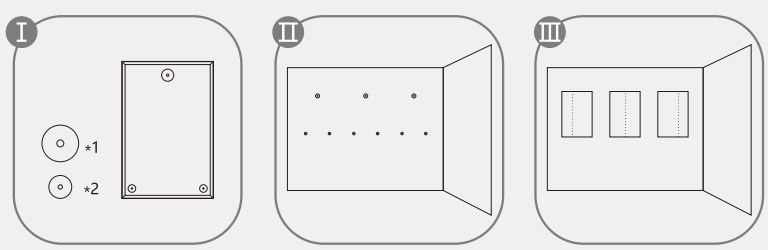


XY0115 XY0214 XY0513 XY0607 XY1214 XY1413

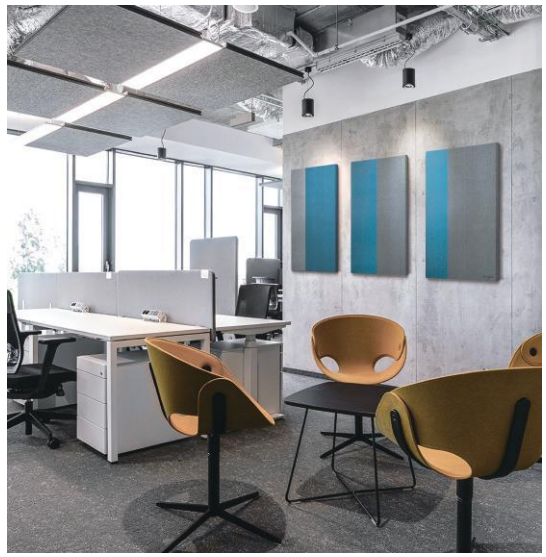




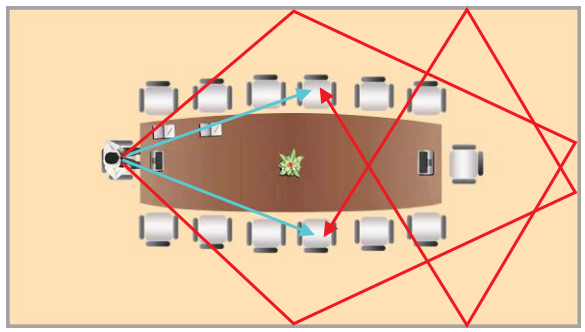
EASY INSTALLATION

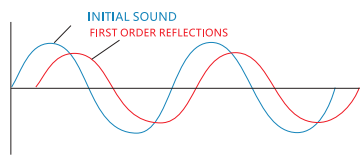




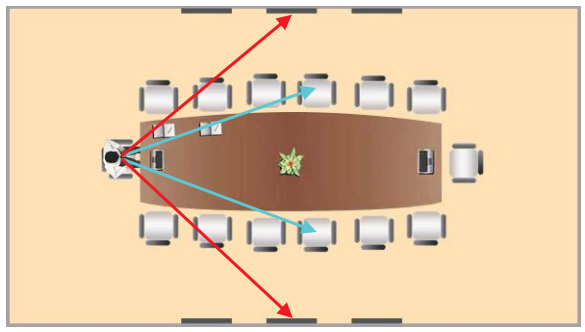


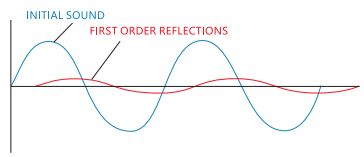






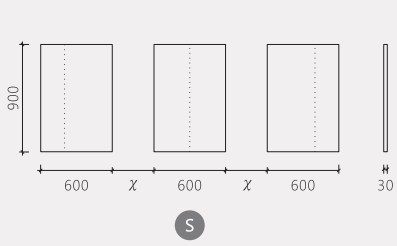
The initial direct sound (blue) overlaps with the powerful multi-order reflection sound (red) reverb. Severely interfering with the speaker linguistic clarity, such a space makes it difficult for the audience to experience the appeal of the language, especially in online meetings.

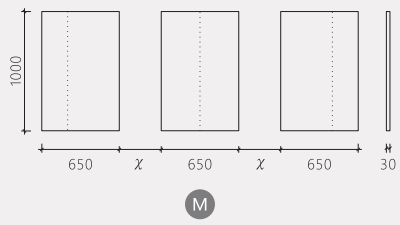


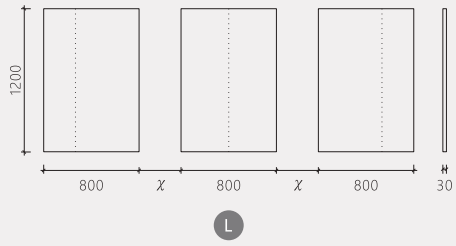


Imagine acoustic magic is installed to form a broadband wave absorbing wall, which effectively reduces the generation amplitude of multi-order reflected sound (red) in space and improves the language clarity by an order of magnitude. What's more, it has the important performance of strong absorption and elimination of background noise in space.

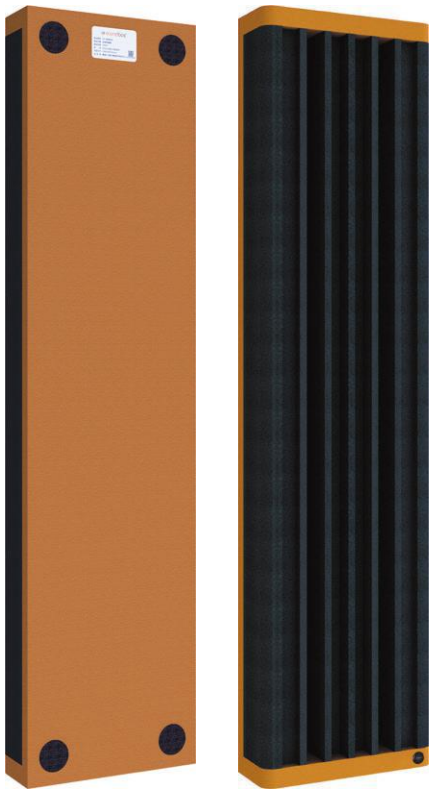
SPECIFICATION SELECTION





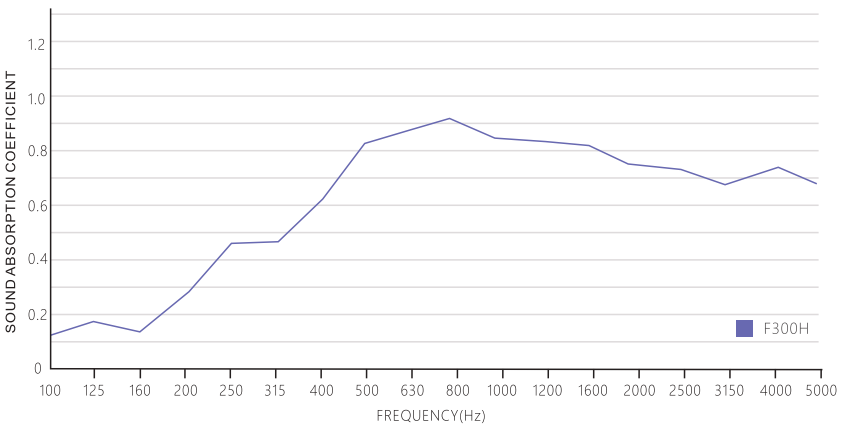


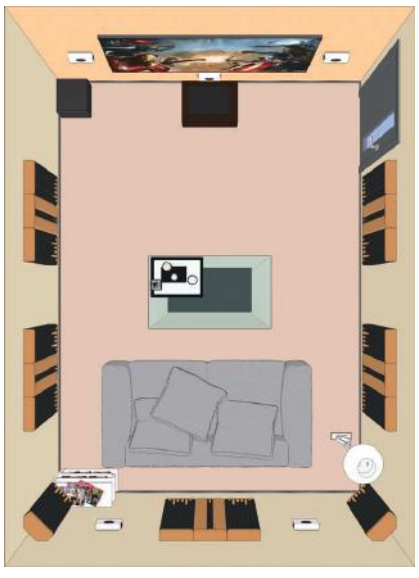
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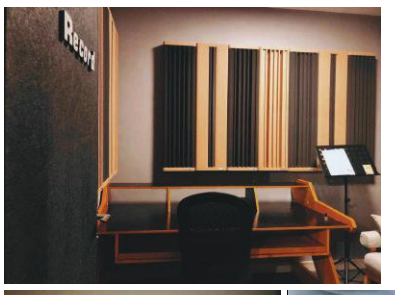
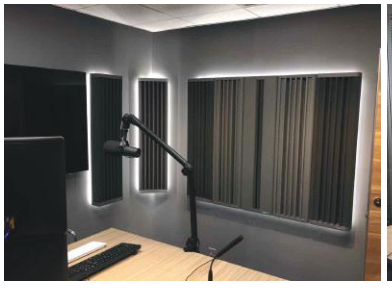
White Light Green Green Orange Light Brown Dark Grey Black

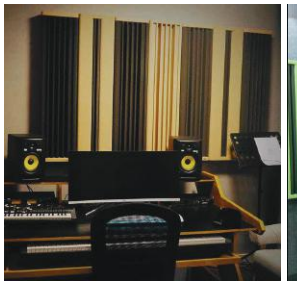
Name: DQ High Frequency Absorber
Mosdel: F300H
Base Material: Polymer/Polyether polyol fire retardant acoustic foam
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: H1200*W300*D100mm
Weight: ≤1.3kg/pcs
Acoustic structure: High density Polyether polyol acoustic foam improves sound that the model absorbs; QRD array achieves broad band frequency absorption, solving the problem arise from too much high frequency and balanced reflection

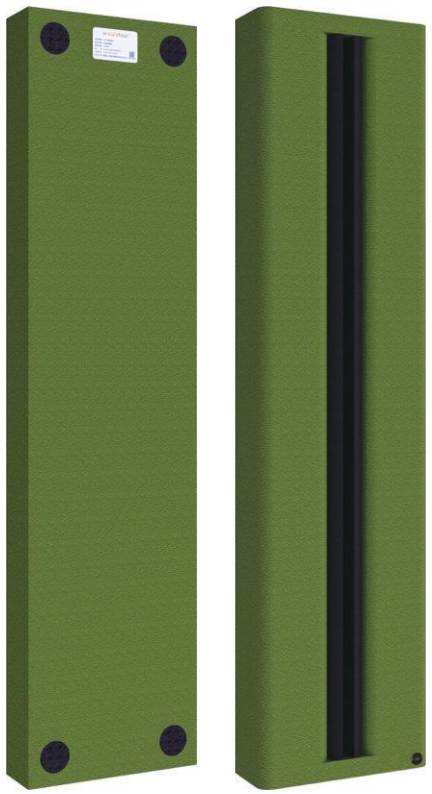






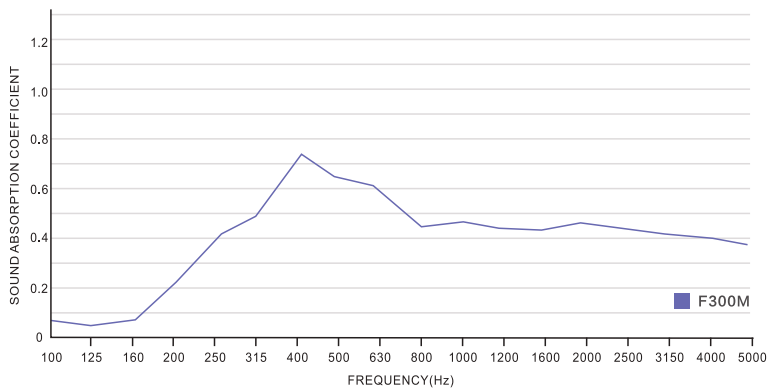





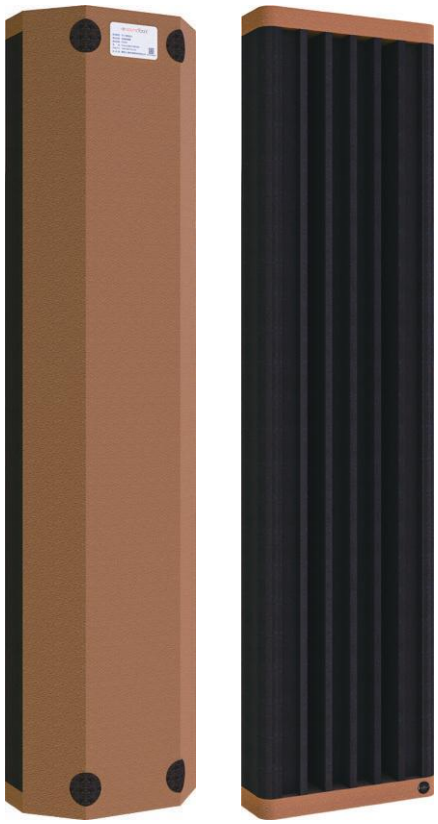



White Light Green Green Orange Light Brown Dark Grey Black

Name: DQ Medium Frequency Absorber
Mosdel: F300M
Base Material: Polymer/Polyether polyol fire retardant acoustic foam
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: H1200*W300*D100mm
Weight: ≤1.6kg/pcs
Acoustic structure: A half concealed cavity structure that is formed polymer material and the U type Polyether polyol acoustic foam, forming a cavity that specialized to deal with low frequency sound of 300-800Hz

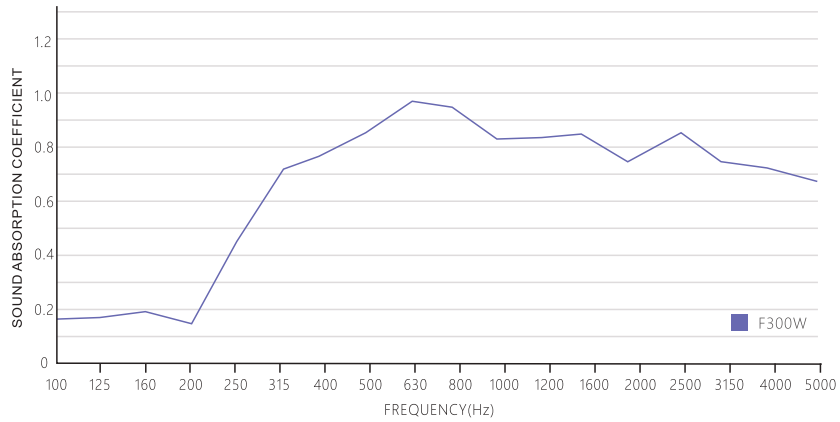








Name: DQ Low Frequency Absorber
Mosdel: F300W
Base Material: Polymer/Polyether polyol fire retardant acoustic foam
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: H1200*W300*D150mm
Weight: ≤1.6kg/pcs
Acoustic structure: High density Polyether polyol acoustic foam improves sound absorption coefficient; QRD array and in-coordinated back cavity structure can achieve certain low frequency absorption. A balanced acoustic environment will be obtain via suitable products combination.











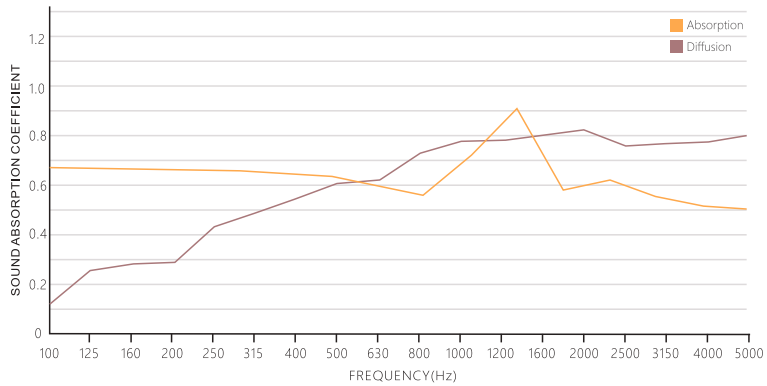






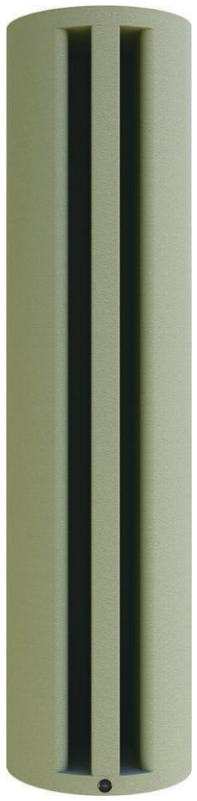


Name: DQ Full Band Frequency Diffuser
Mosdel: F300D
Base Material: Polymer,chemical compound with large molecules
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: H1200*W300*D100mm
Weight: ≤2.8kg/pcs
Acoustic structure: Combining high tensile inorganic polymer coating, it will satisfy our stringent technical requirement from design on diffusion frequency and density of materials. At the same time, we are able to decrease product weight by eliminating defects of traditional materials. QRD array plays diffusion role effectively. When bettering sound dryness in small rooms, it improves sound fullness and surrounding sense without hurting natural reverberation.

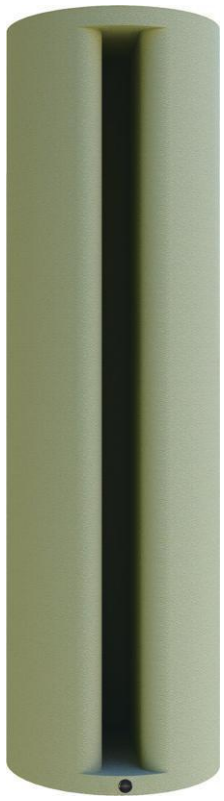




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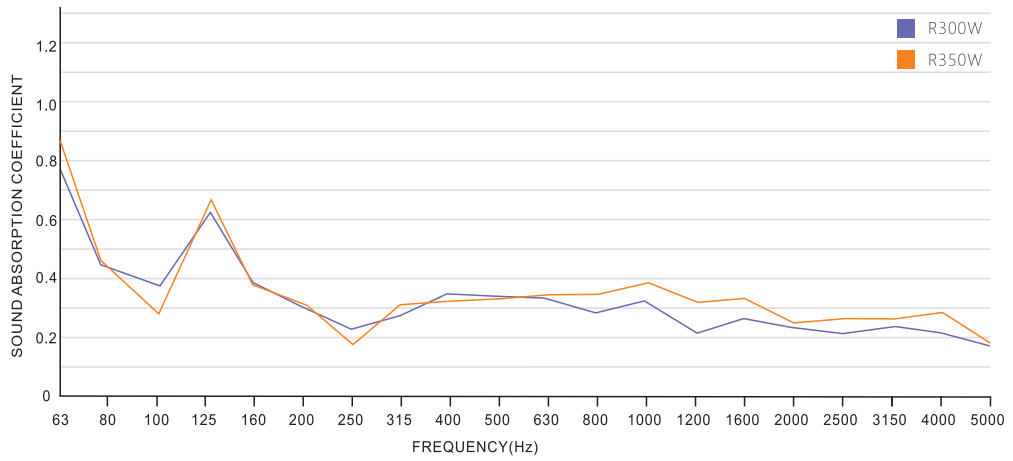
R300W

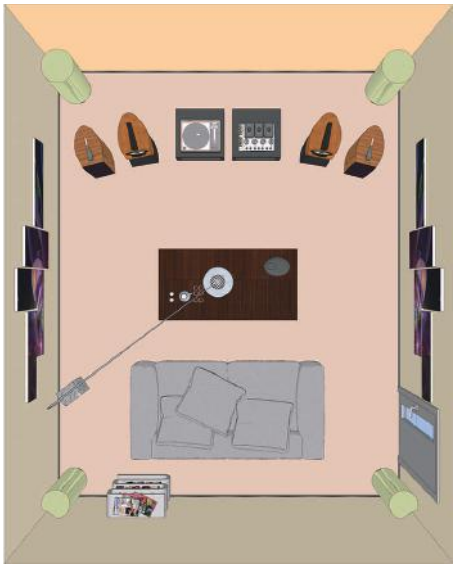


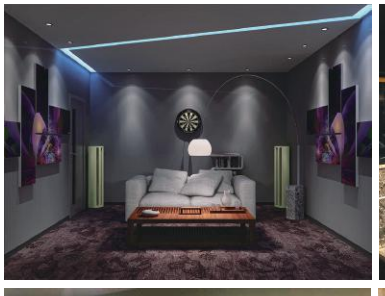
R350W



Name: DQ Cylinder Basstrap
Mosdel: R300W/R350W
Base Material: Polymer,chemical compound with large molecules
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: R300W: φ300*H1200 mm R350W: φ350*H1200 mm
Weight: R300W: ≤2.8kg/pcs R350W: ≤3.5kg/pcs
Acoustic structure: Combining high tensile inorganic coating, they are formed by pouring Polymer materials which is with good low absorption character, decreasing weight and overcome traditional drawbacks. Adopting the wise open resonance box model, it is the one of the effective approaches to capture 100-250Hz, taming most of problems caused by excess of low frequencies.

















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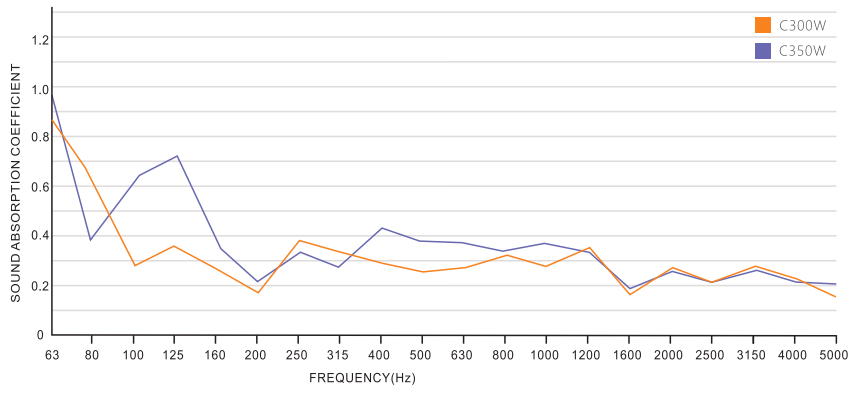
C300W



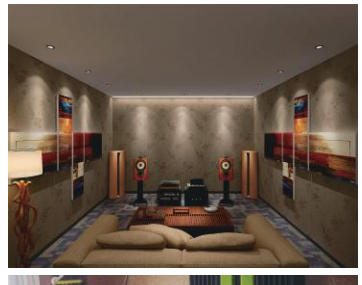
C350W



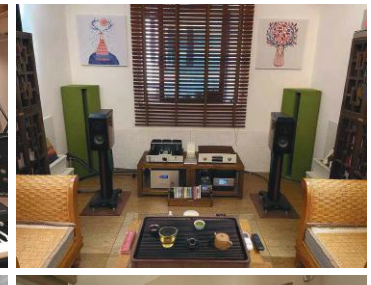
Name: DQ Corner Basstrap
Mosdel: C300W/C350W
Base Material: Polymer,chemical compound with large molecules
Finish: E0 Eco-friendly water based paint
Eco-Friendly: Zero Formaldehyde emission; Up to E0 standard
Size: C300W: H1200*W300*D300mm C350W: H1200*W350*D350mm
Weight: C300W: ≤2.8kg/pcs C350W: ≤3.2kg/pcs
Acoustic structure: Combining high tensile inorganic coating, they are formed by pouring Polymer materials which is with good low absorption character, decreasing weight and overcome traditional drawbacks. Adopting the wise open resonance box model, it is the one of the effective approaches to capture 100-250Hz, taming most of problems caused by excess of low frequencies.

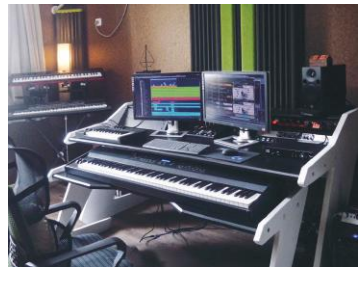




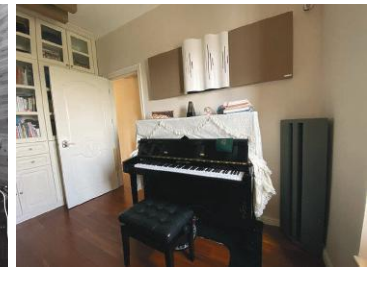












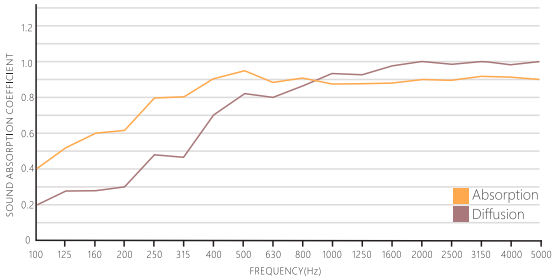
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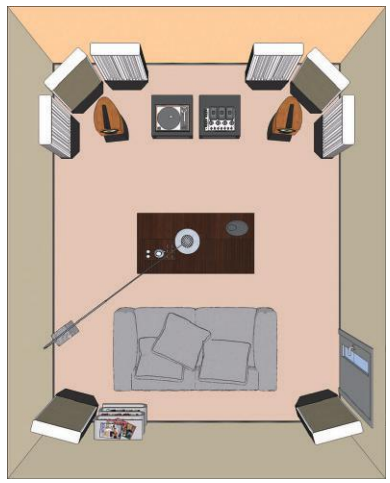




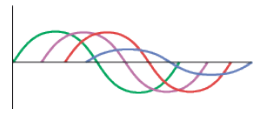
Name: Acoustic Baffle
Mosdel: AQ1000S
Structure: Solid wood formation. Large version of QRD quadratic residue diffusion surface, three-step non-proportional cavity broadband sound absorption surface, labyrinth-type low-frequency trap with vibration damping base..
Finish: SF1200 Acoustical fabric for sound absorption; Diffusion side: Solid wood (Refer to color chart for details)
Eco-friendly: International E0 standard
Specification: H1600 * W600 * D150/350mm
Weight: 38Kg
Optional: Movable roller accessories can be installed on the base (purchased separately)
Application: Suits for controlling reverberation time and standing waves at the corner in small rooms, for example, listening rooms, studio and home theater. Moreover, it does well in sound absorption and diffusion when sound is being reflected.

The most important goal of the room acoustic treatment is to establish a neutral listening space. Most of the residential or commercial rooms adopt the rectangular parallel walls. It means that those rooms will suffer from strong reflection, flutter echo, standing waves and resonance.
AQ1000S easy acoustic does not mean that you can make the bedroom favorably compare with the professional audio studio established by spending millions of dollars. However, what we can do is to make a poor resonant room become a very practical space. It will help you obtain the conditions for finishing the audio work.



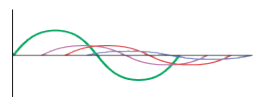






All the wrong kind sound reflection lean to exxessivereverberation and amplitude of vibration,which makesound location become difficult.

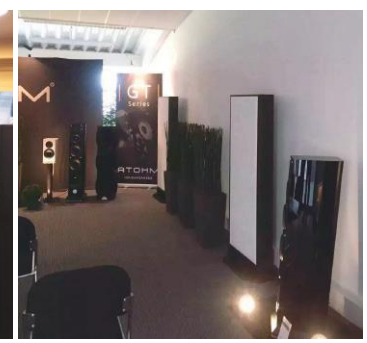




Our products can contro sound reflection and decrease standing wave in low frequencyvia acoustic treatiment,improving acoustic enviromenr in smll space.

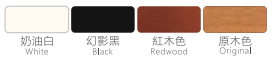


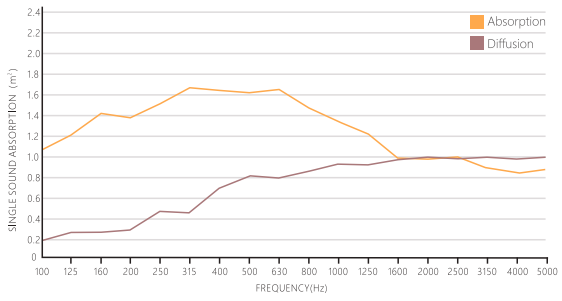




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Name: Haydn Acoustic Array
Mosdel: AQ1000SL
Structure: Solid wood formation. Large version of QRD quadratic residue diffusion surface, three-step non-proportional cavity broadband sound absorption surface, labyrinth-type low-frequency trap with vibration damping base.
Finish: SF1200 Acoustical fabric for sound absorption; Diffusion side: Solid wood (Please refer to color chart for details)
Eco-friendly: International E0 standard
Specification: H2400 * W600 * D150/800mm
Weight: 71Kg
Application: Suits for bigger rooms, for example, listening rooms, studio and home theater.

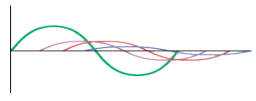
Sound energy needs to be cherished and used skillfully. It is difficult to achieve a pertinent spatial sound environment with single absorption, and it will also consume a lot of favorable sound energy, meaninglessly wasting the sound power of equipment.
The AQ1000SL fully diffuses the powerful primary reflection sound, the non-proportional cavity broadband strong absorption surface deals with multiple reflection sounds that are not conducive to space, and the labyrinth-type low-frequency trap captures low-frequency standing waves that like to hide in corners. The movable and convenient design caters to your DIY smart ideas for space and sound.







All the wrong kind sound reflection lean to excessive reverberation and amplitude of vibration,which makesound location become difficult.



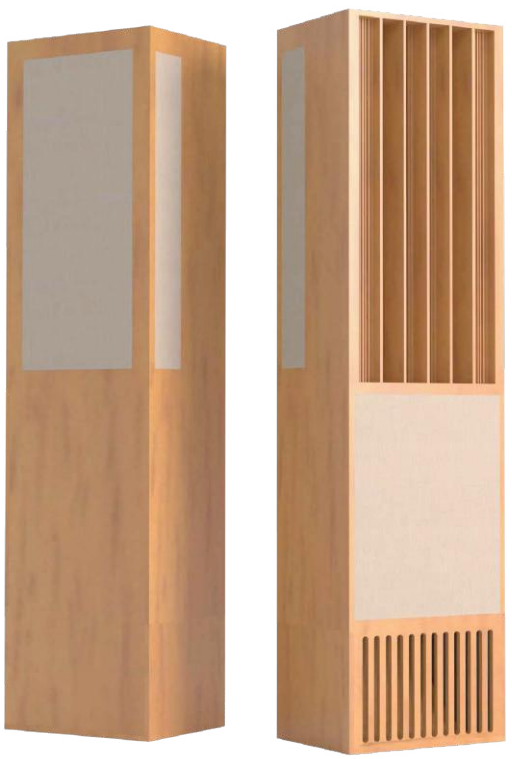
Our products can control sound reflection and decrease standing wave in low frequency via acoustic treatment, improving acoustic enviroment in small space.





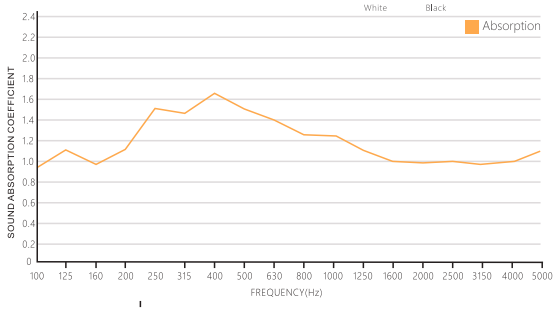


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Name: Bach Acoustic Array
Mosdel: AQ1000SW
Structure: The high-density solid wood structure is composed of three-section structures of medium and high frequency diffusion, medium and low frequency absorption cavities.
Finish: 268-12 Acoustical fabric for sound absorption;
Eco-friendly: International E0 standard
Specification: H2350*W600*D450mm
Weight: 100Kg
Application: Suits for bigger rooms, for example, listening rooms, studio and home theater.

AQ1000SW integrates three sound optimization modes, the upper half of the front composite QRD medium and high frequency diffusion, the built-in Helmholtz resonator in the middle, and the lower labyrinth low frequency trap.
Comb filtering and residual low frequency commonly found in rectangular spaces are the killer of sound quality. Conventional narrow-band diffusers and low-frequency traps are difficult to control. Bach's innovative acoustic array design and composite QRD diffusion break through everyone's concerns about QRD diffusion bandwidth. , the built-in Helmholtz resonator captures the mid-low frequency margin in the most efficient way. The most unexpected thing is that its low-end labyrinth-type low-frequency trap phase guide runs through the back of the entire combination, and the 2.4-meter-long phase guide is realized. It reduces the consumption of ultra-low frequency headroom waves below 50Hz.

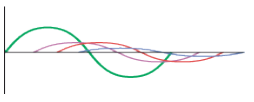








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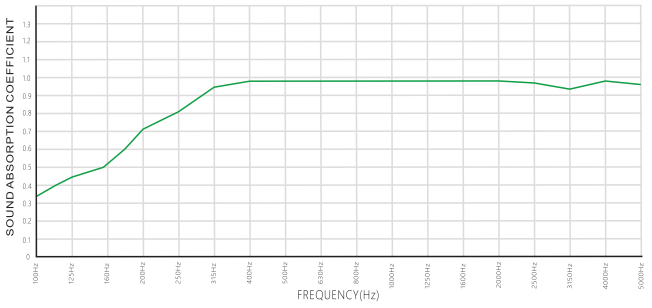


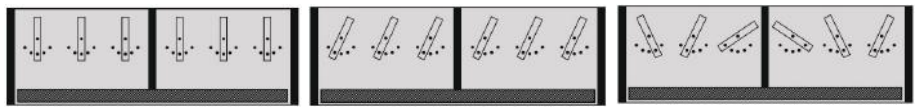
Name: Smartfuser
Mosdel: AQ1000M
Specification: H1200*W600*D200mm
Weight: ≤16.2kg/pcs.

Variable lath diffusion and cavity absorption design to effectively eliminate flutter echoes and standing waves. Diffusion angles can be adjusted as required by different applications e.g. recording rooms and home theaters etc. SonoCalm "controllable diffuse reflection combination" is an innovative combination of diffusion and absorption to eliminate high frequency flutter echoes and effectively make use of the main reflected sound. The "controllable diffuse reflection combination" has an overall size of 600x1200mm, composed of 6 variable direction diffusion laths, which rotate to different angles to eliminate the high frequencies and create the required energy distribution. High density strong sound absorbing board is provided behind the reflection laths to effectively absorb 250Hz and eliminate the harmonic waves behind the oriented reflection board. It can be easily installed using just household tools in not more than 15 minutes. The elegant appearance with porous meshes and resin hardened edges makes it suitable for most architectural space designs. Install 3 or more units of Soundbox controllable diffuse reflection combination at the listening positions, and the spatial impression can be experienced immediately. In the meantime, the units absorb the negative reflections, standing waves and trouble-some flutter echoes to tune the near wall main reflections for HIFI listening rooms, home theaters and small audio studios.

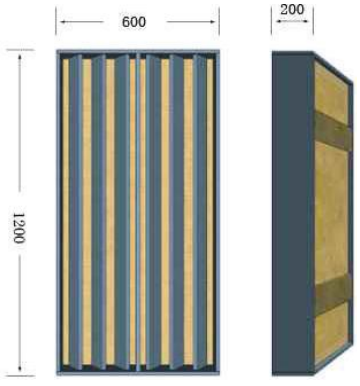








Vertical opening for sound absorption Inclined opening for reflection Left and right opening for diffusion







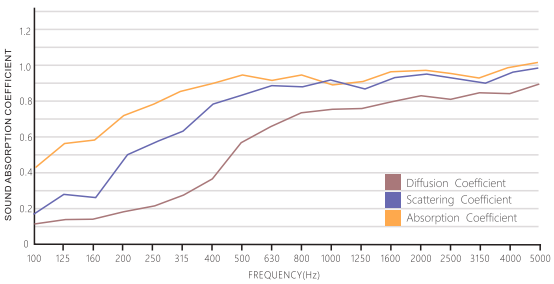
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Name: Movable Acoustic Baffle
Mosdel: AQ1000H/HD
Structure Properties: A patented metal frame that is anti sound reflection & resonance and anti oxidation treated;
Side A performs excellently in absorbing sound in all frequency.
Side B--The MLS diffusing cloud is made by HIPS forming process.
Base Material: Ultramicropore glass fiber in different density. Green treatment without any formaldehyde emission.
Installation:
1000H -- Standard fixing system with wheels; Hidden rectangle fixed groove
1000HD --Standard holes for horizontal or vertical hanging
Finish: 1)Acoustical fabric for sound absorption;
2)Diffusion side: PU Matte painting (Please refer to color chart for details)
Eco-Friendly: Up to international E0 standard
Flame retardation: Base material--Grade A
Size: AQ1000H 2100*800*200mm; AQ1000HD 2000*800*100mm
Weight: AQ1000H 28kg / AQ1000HD 15.5kg
Scope of Application:
AQ1000H -- A semi-enveloped acoustic absorbing shell for portable stage
AQ1000HD -- A hanging acoustic absorbing shell
Acoustic Properties: Movable acoustic baffle help to control long reverberation time, fluttering echo, parallel sound reflection and standing wave in medium frequency for churches, halls, multi-functional rooms, and studio. Meanwhile, it's a quick outdoor acoustic shell solution.



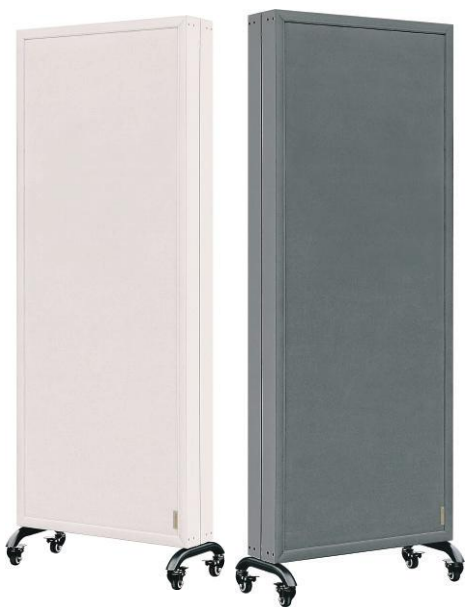








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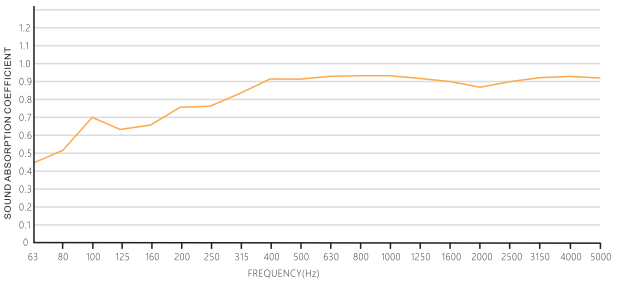


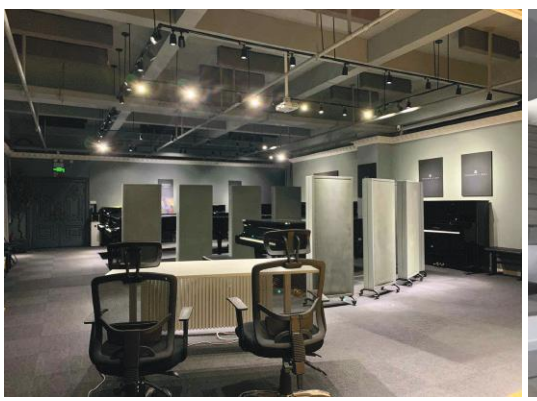
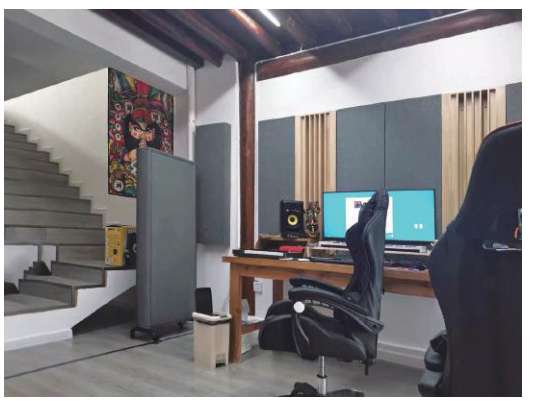
Name: Movable Acoustic Baffle
Mosdel: AQ150W
Structure Properties: Anti oxidation treatment, metal frame patented structure, AB full frequency strong sound absorption on both sides
Base Material: Ultra-micropore composite acoustic wool of different density, zero-emission and eco-friendly
Installation: AQ150W is equipped with a mobile pulley device as standard, and the frame is a hidden matrix fixed slot
Finish: Flocking flame retardant acoustic cloth
Eco-Friendly: Up to international E0 standard
Flame retardation: Base material--Grade A
Size: H1620*W800*D200mm（H高度含腳架）
Weight: 15.6Kg
Scope of Application: Easily build movable sound absorption barrier
Acoustic Properties: The movable acoustic baffle can easily and effectively control the reverberation time, vibration echo, parallel plane reflection sound, medium and low frequency standing wave and other environmental sound defects in conference rooms, multi-function halls, offices and other spaces. It's quickly build and movable sound barrier structure, meets room acoustic requirements easily.

The two-sided absorbing design ensures very good sound absorption performance, and the ultra-micropore composite acoustic wool of different density and acoustic fabric finish enhances the absorbing coefficient.
Equipped with universal mute wheel, the professional acoustic environment can be built and adjusted at any time. It can be assembled and disassembled in 5 minutes. It can be flexibly placed anywhere that decorate s the room well.



White Dark Grey Black



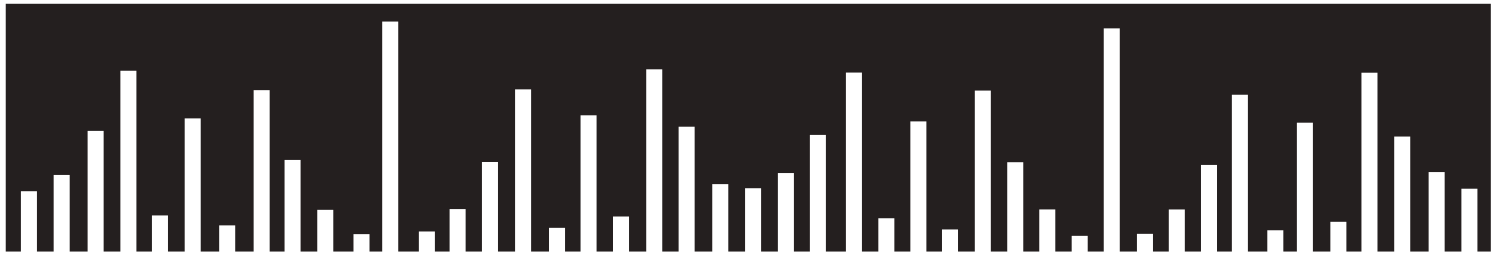
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Acoustic diffusion is an important part of building acoustics. Many calculations, for example, Sabine formula or Eyring formula calculation, are based on fully diffused acoustic fields. If an acoustic field is not fully diffused, the accuracy of acoustic calculations may be influenced. Therefore, it is an important part of building acoustics to make the sound fields diffuse evenly, beneficial for purification and improvement of the sound quality. The theories of acoustic field diffusion come from the quadratic residue diffusion theory proposed by Manfred R Schroeder, a German physicist and acoustician in 1975. The results of diffusion using the method of quadratic residue sequence indicate that these cyclic sequences have the capability to distribute abundant harmonic waves in a balanced manner. In other words, the soun waves generated due to geometries of the rooms or early reflected sound are re-distributed in the sense of time, and are released out smoothly. According to this research, the diffusion of sound waves greatly helps human ears with listening. In the quadratic residue diffusion theory, "quadratic" means the square root, and "residue" refers to the remainder of a natural number divided by a prime number (i.e. the remaining part of the number that cannot be fully divided other than 1 and the number itself). As the sound waves are made to be diffused more evenly, the quadratic residue diffusion boards have positive influence on the sound quality. The diffusion boards are composed of steps of different depths based on calculations as per the quadratic residue theory. The sound energy enters the steps and is then gradually released at different time. The result is that the peaks and valleys are smoother, forming a more balanced acoustic environment. The diffusion boards are used not only on ceilings but also on the side walls and the walls behind loudspeakers and behind the listening positions. The more the diffusion materials, the more can people feel the sense of space and the natural and graceful effect of high frequencies in the music places. The details of music can also be shown well, some minor dynamic changes normally hard to be perceived can be clearly shown.

QRD 2D Diffuser Design Basis (Quadratic Residue)

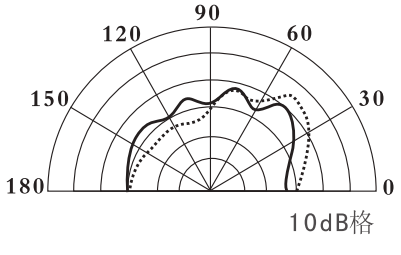
QRD diffuser is composed of a series of parallel sunk panels of different depths. When the sound wave is incident on a QRD at a horizontal position by 135°, it can reflect the sound out with equal strength by 30°-150°

QRD Diffuser Structure and Performance



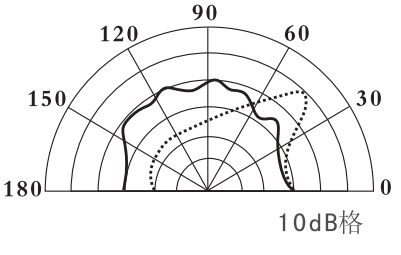
800Hz

800Hz frequency multiplication band



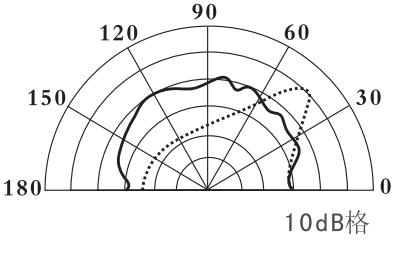
1600Hz

1600Hz frequency multiplication band

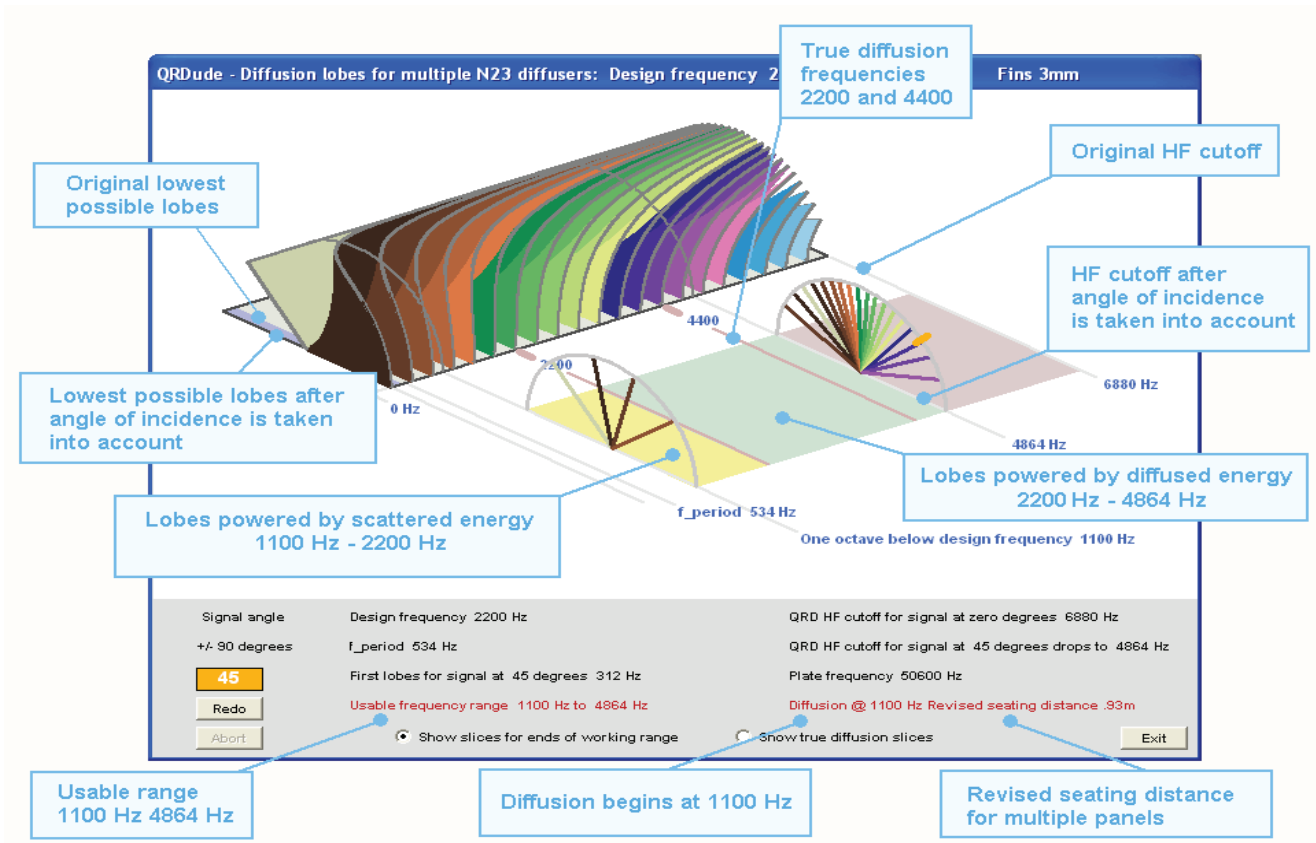


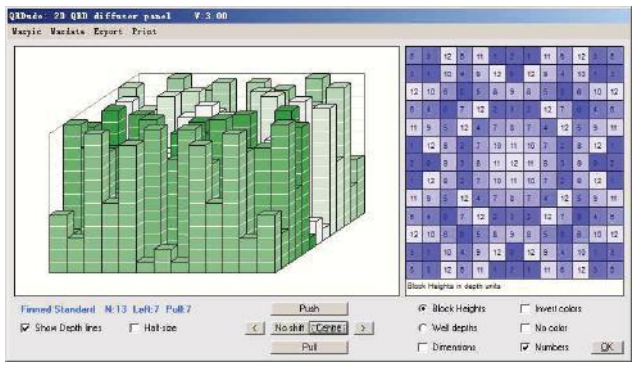
3200Hz

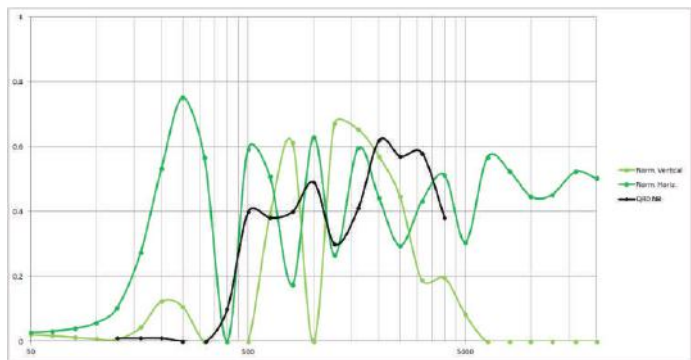
3200Hz frequency multiplication band

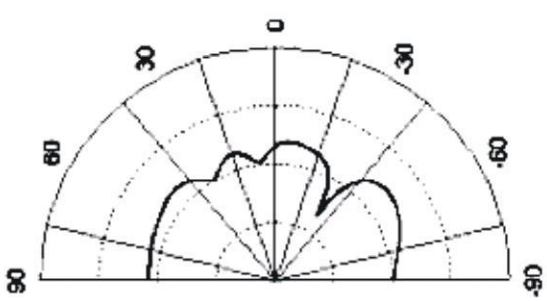


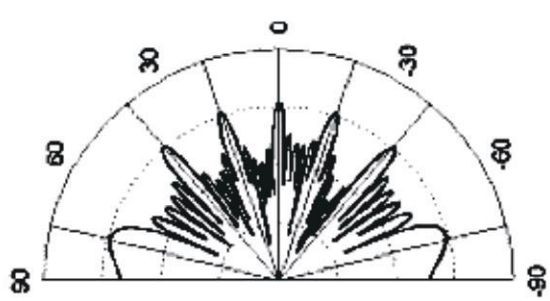
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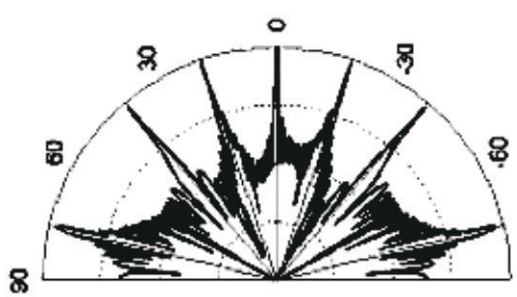

QRDude - Diffusion lobes for multiple N23 diffusers: Design frequency 2
Fins 3mm
True diffusion frequencies 2200 and 4400
Original lowest possible lobes
Original HF cutoff
HF cutoff after angle of incidence is taken into account
Lowest possible lobes after angle of incidence is taken into account
Lobes powered by scattered energy 1100 Hz - 2200 Hz
Lobes powered by diffused energy 2200 Hz - 4864 Hz
0 Hz
2200
4400
6880 Hz
4864 Hz
f_period 534 Hz
One octave below design frequency 1100 Hz
Signal angle
+/- 90 degrees
45
Redo
Abort
Design frequency 2200 Hz
f_period 534 Hz
First lobes for signal at 45 degrees 312 Hz
Usable frequency range 1100 Hz to 4864 Hz
Show slices for ends of working range
QRD HF cutoff for signal at zero degrees 6880 Hz
QRD HF cutoff for signal at 45 degrees drops to 4864 Hz
Plate frequency 50600 Hz
Diffusion @ 1100 Hz Revised seating distance .93m
Show true diffusion slices
Exit
Usable range 1100 Hz 4864 Hz
Diffusion begins at 1100 Hz
Revised seating distance for multiple panels

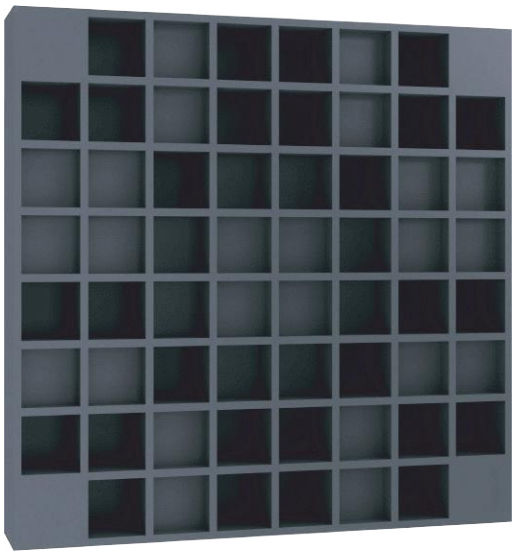

QRDude: 23 QRD diffuser panel V 3.00
Acrylic Wavelets Export Print
Finned Standard N:13 Left:7 Pull:7
Show Depth lines
Half-size
Push
No shift Centre
Pull
Block Heights
Well depths
Dimensions
Invert colors
No color
Numbers
OK




0
30
-30
60
-60
90
-90

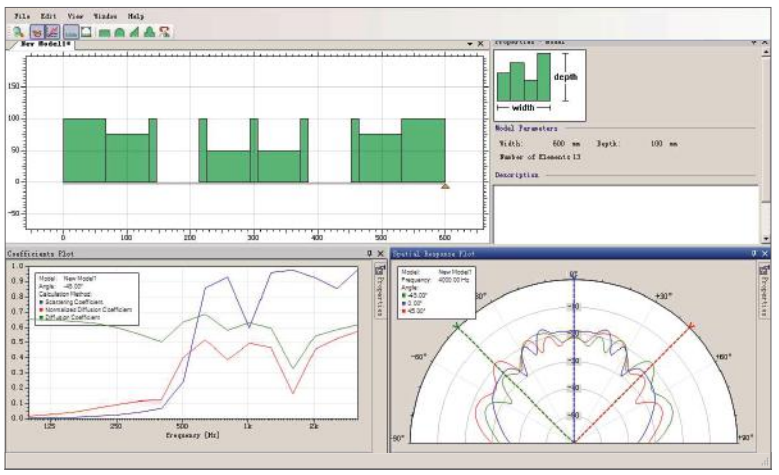

0
30
-30
60
-60
90
-90


0
30
-30
60
-60
90
-90



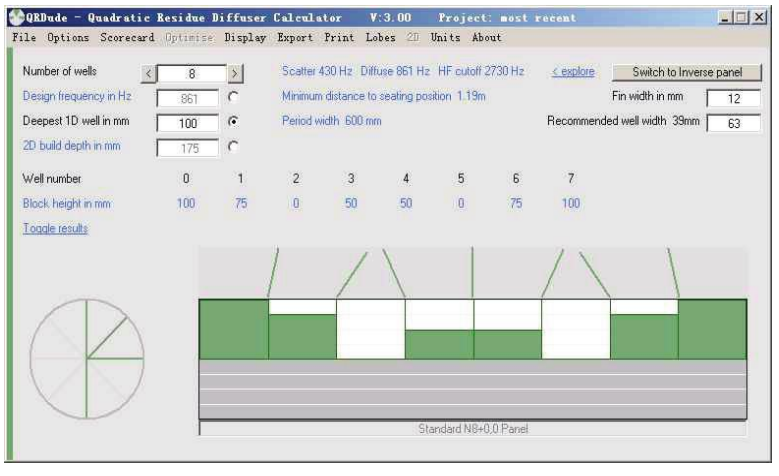
Name: Chessfuser
Mosdel: D64
Base material: rubber solid wood
Environmental protection: purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: D64 solid wood diffuser is a located sequence grating based on QRD theoretic formula calculations. Its groove depth and width enable it to have uniform diffuse reflections for the incident sound from different angles and all the directions to make human voices more agreeable and high frequencies more gorgeous like in a large hall.
Diffusion frequency range: 430Hz-861Hz (maximum 2730Hz)
Scope of application: opera houses, music halls, places of leisure, private theaters, recording studios, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Specification: H600*W600*D100mm
Weight: 11.6kg/pcs







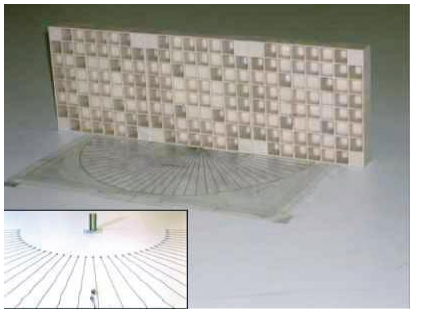








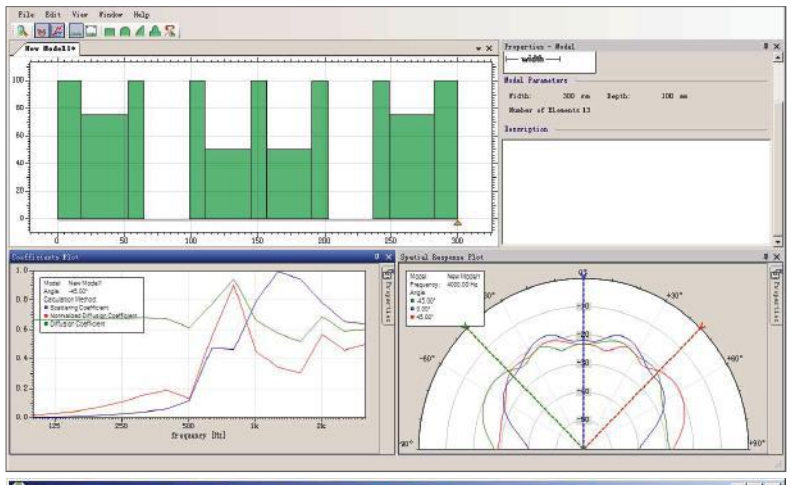


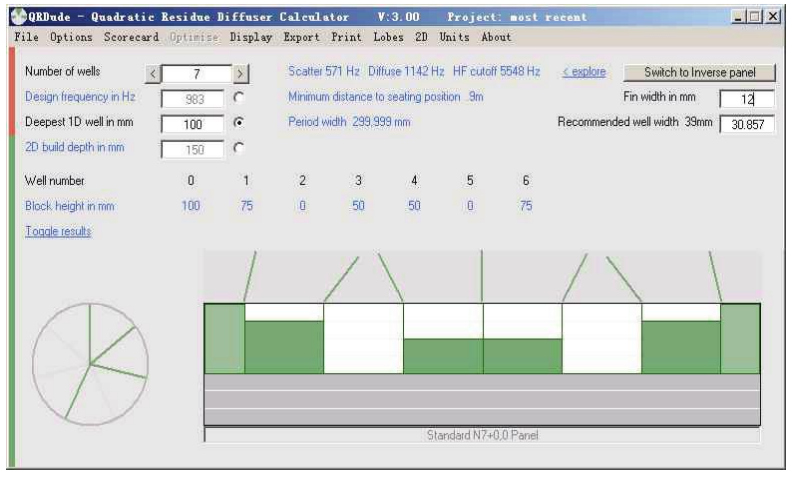


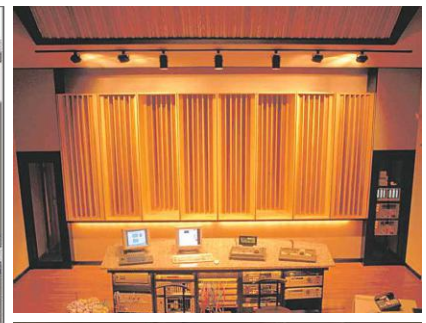




Name: Quadrifuser
Mosdel: D30S / D30
Base material: Rubber solid wood
Environmental protection: purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: D30 solid wood diffuser can be used to diffuse the sound energy in a stereophonic manner, prevent echoes and standing waves to realize diffusion in all the directions, and improve the articulation of sound and the sense of space.
Scope of application: opera houses, music halls, private theaters, recording studios, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Diffusion frequency range: 571Hz-1142Hz (maximum 5548Hz)
Specification: D30S H600*W600*D100mm
D30 H1200/1800*W600*D100mm
Weight: D30S ≤11.8kg D30 ≤ 23.6/35.4kg

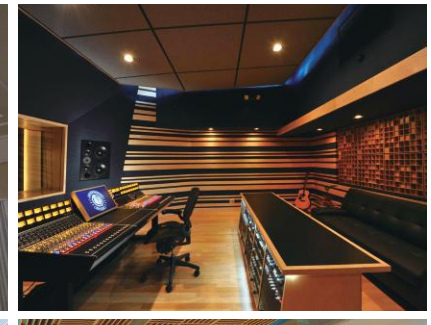




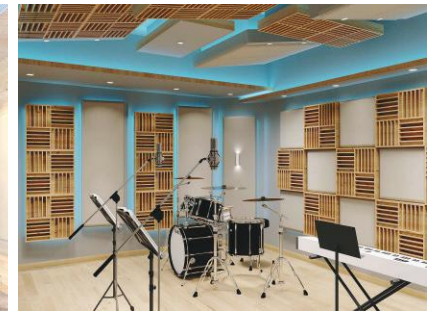










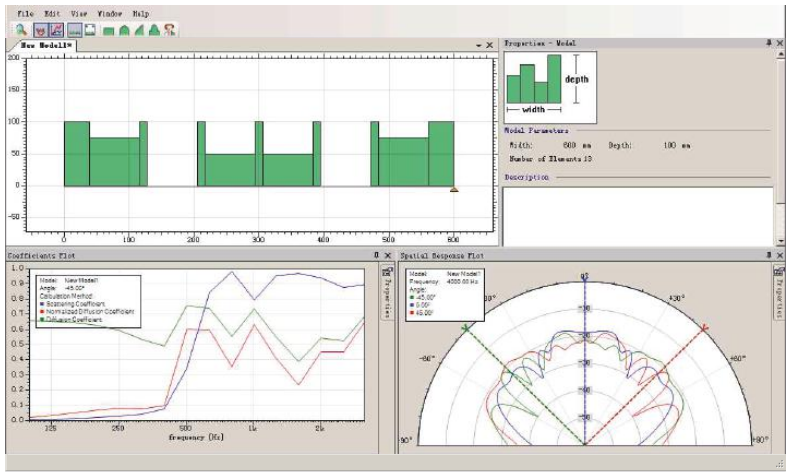


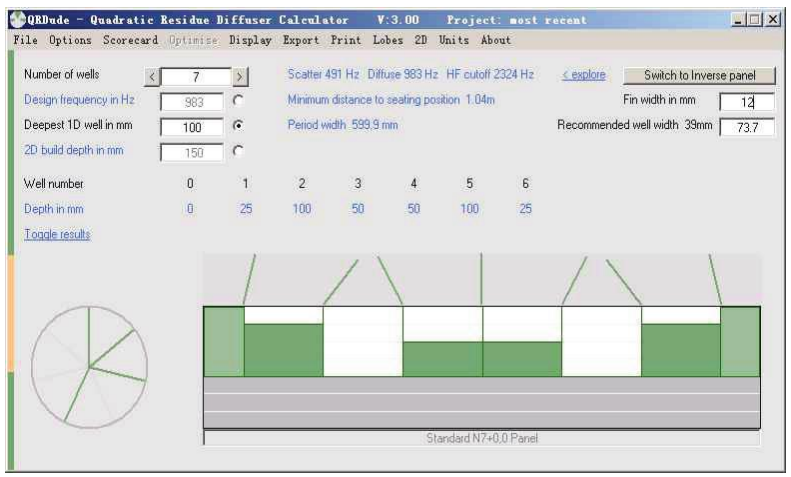
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Name: Octofuser
Mosdel: N8
Base material: Rubber oak wood
Environmental protection: purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: N8 solid wood diffuser can be used to diffuse the sound energy, prevent echoes and standing waves to realize diffusion in all the directions, and improve the articulation of sound.
Diffusion frequency range: 491Hz-983Hz (maximum 2324Hz)
Scope of application: opera houses, music halls, places of leisure, private theaters, recording studios, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Specification: H600*W600*D100mm
Weight: ≤11.5kg







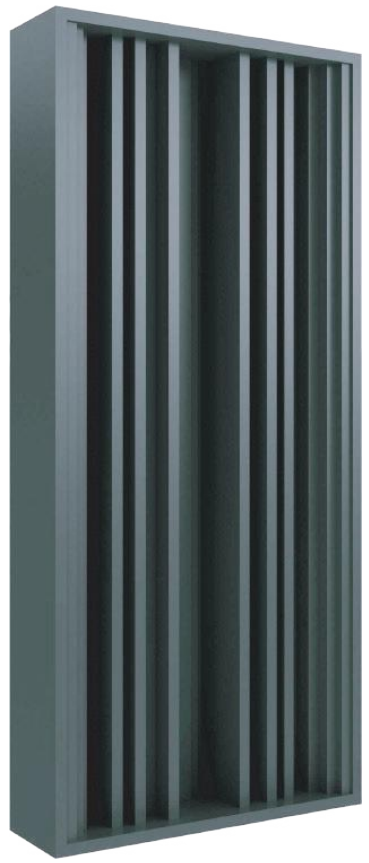






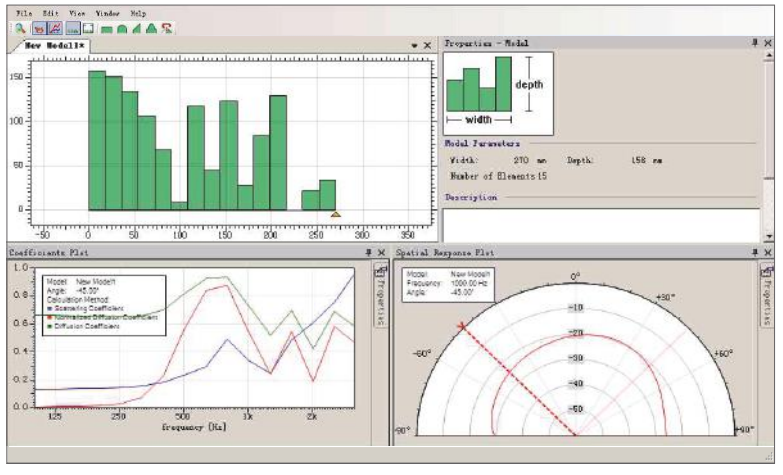


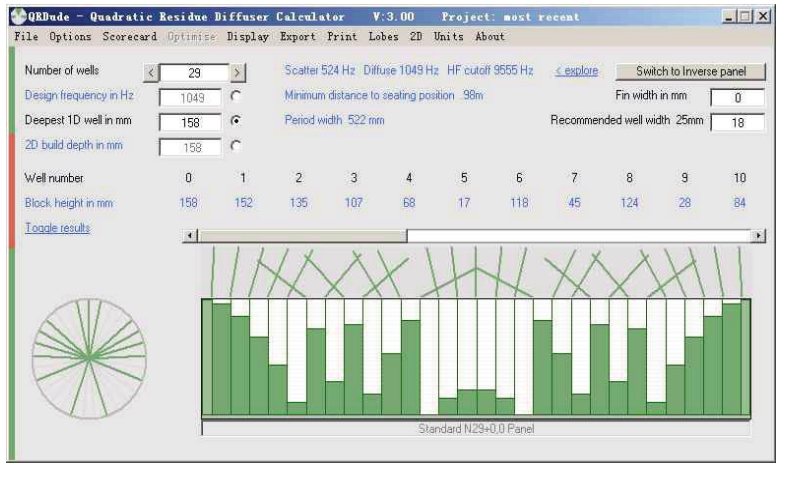




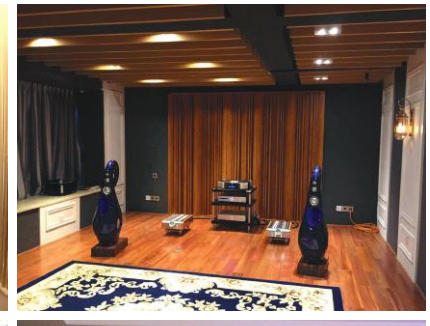
Name: Metafuser
Mosdel: N29
Base material: Rubber oak wood
Environmental protection: purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: N29 solid wood diffuser can be used to resume the sense of space of sound and improve the sound quality greatly. Its acoustic characteristics reach the requirements of national standards for materials of the same type. It is used along with solid wood sound absorbing boards with slotted holes to effectively improve the fullness, articulation and sense of stereophony of sound.
Diffusion frequency range: 524Hz-1049Hz (maximum 9555Hz)
Scope of application: opera houses, music halls, places of leisure, private theaters, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Specification: H1200/1500/1800*W540*D158mm
Weight: H1200≤41.5kg / H1500≤51.8kg / H1800≤62.2kg



















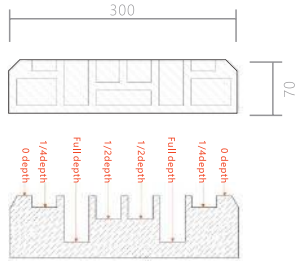


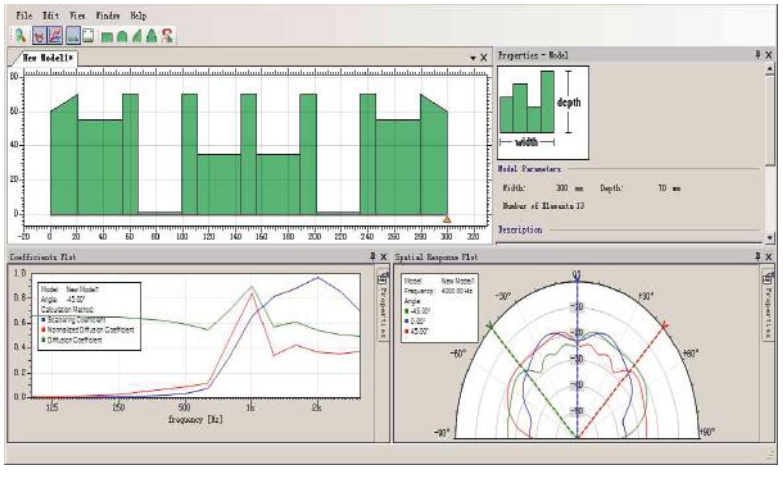
Name: FUSEASER
Mosdel: D80
Base material: rubber solid wood
Environmental protection: purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Main features: D80 has significant diffusion effect. On condition of not increasing the reverberation time, it can deal with the problem of sound dryness in small spaces effectively and improve the fullness, articulation and sense of stereophony.
Common specification: H1200/1500/1800*W300*D70mm
Weight: H1200≤10kg / H1500≤12.6kg / H1800≤15.1kg
Scope of application: Flush mounted at high grade places e.g. music halls, home theaters, HIFI listening rooms and recording rooms, and places requiring improvement of sound quality and articulation

Diffusion principle

QRD diffuser is composed of a series of parallel sunk panels of different depths. When the sound wave is incident on a QRD at a horizontal position by 135°, it can reflect the sound out with equal strength by 30°-150°.





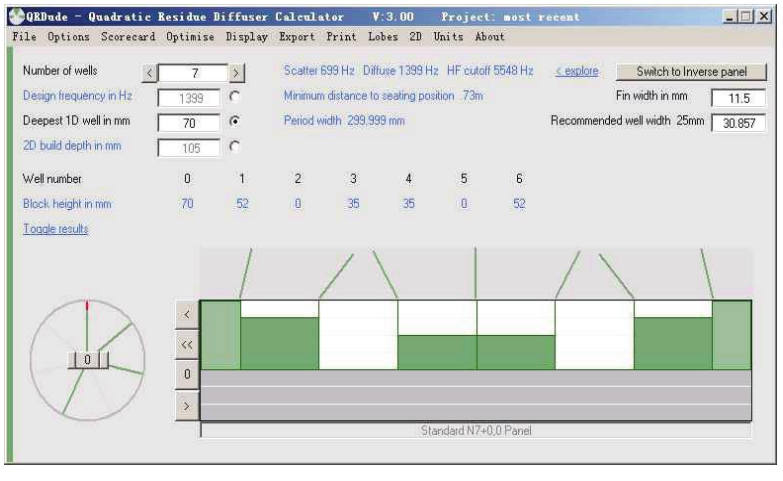








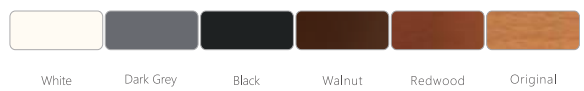


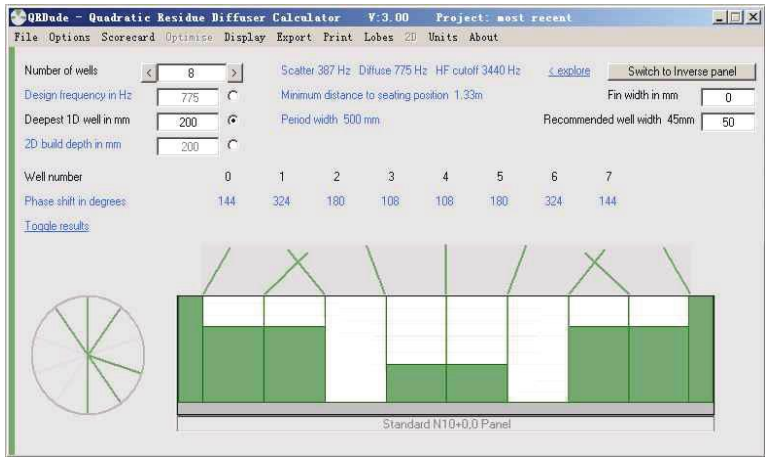


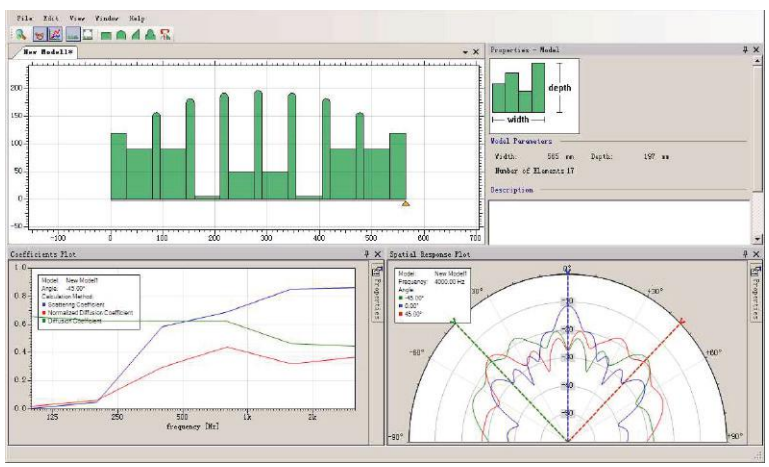




Name: TRAPFUSER
Mosdel: D80W
Base material: Rubber solid wood
Environmental protection: Purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Main features: D80W is an in-depth solution to the problem of standing waves in corners. As a combination of low frequency absorption and diffusion technologies, it not only solves the problem of sound confusion in corners, but also makes use of the corners to enhance the sound energy by at least 3dB, effectively improving the sound fullness, curve straightness, richness and sense of stereophony.
Common specification: H1200/1500/1800*W350*D350mm
Weight: H1200≤22.5kg / H1500≤28.1kg / H1800≤31.5kg
Scope of application: Wall mounted at places e.g. music halls, home theaters, HIFI listening rooms and recording rooms, and places requiring improvement of sound quality and articulation
Diffusion principle:
QRD diffuser is composed of a series of parallel sunk panels of different depths. When the sound wave is incident on a QRD at a horizontal position by 135°, it can reflect the sound out with equal strength by 30°~150°.



















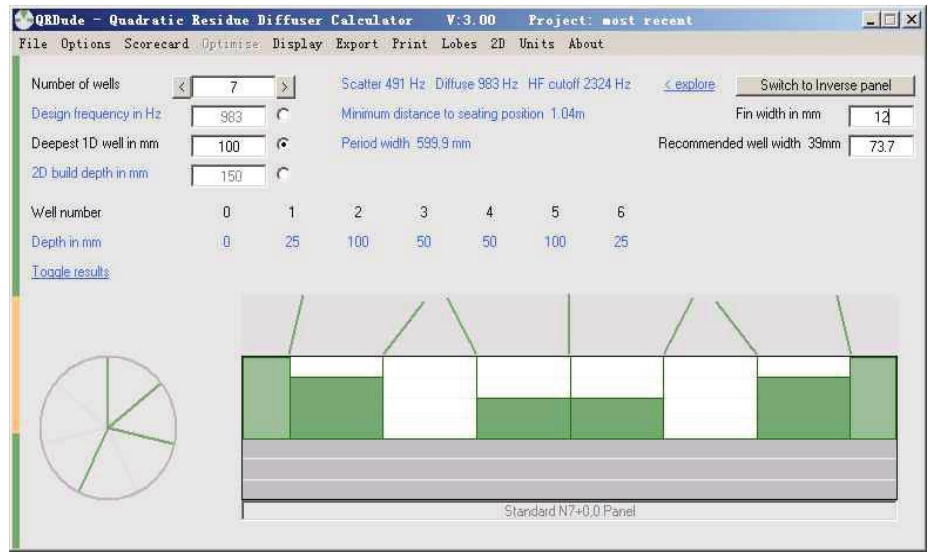


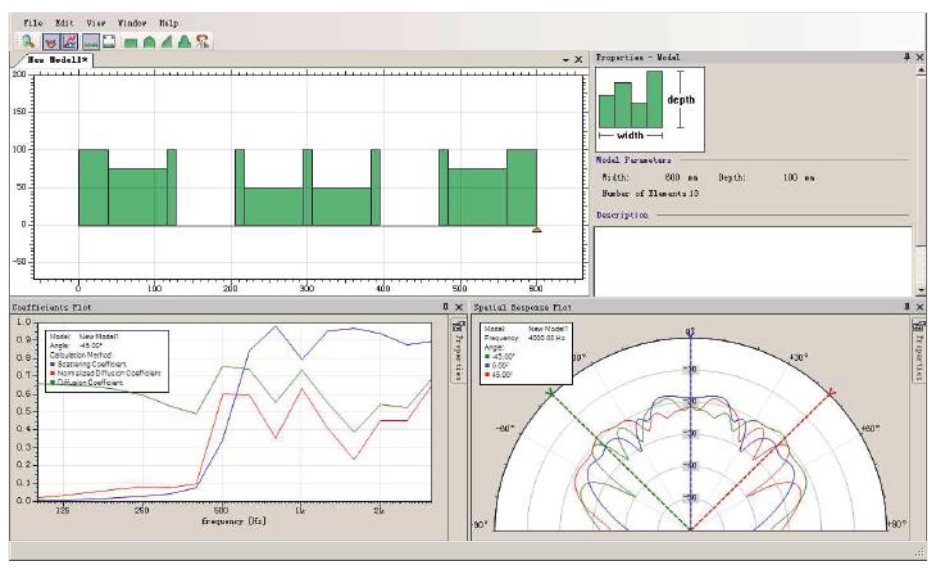
Name: TRIFUSER
Mosdel: D60
Base material: Rubber solid wood
Environmental protection: Purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: D60 solid wood diffuser is a located sequence grating based on QRD theoretic formula calculations. Its groove depth and width enable it to have uniform diffuse reflections for the incident sound from different angles and all the directions to make human voices more agreeable and high frequencies more gorgeous like in a large hall.
Scope of application: Opera houses, music halls, private theaters, recording studios, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Diffusion frequency range: 491Hz-983Hz (maximum 2324Hz)
Specification: H1800*W600*D100mm
Weight: ≤29.6kg/pcs



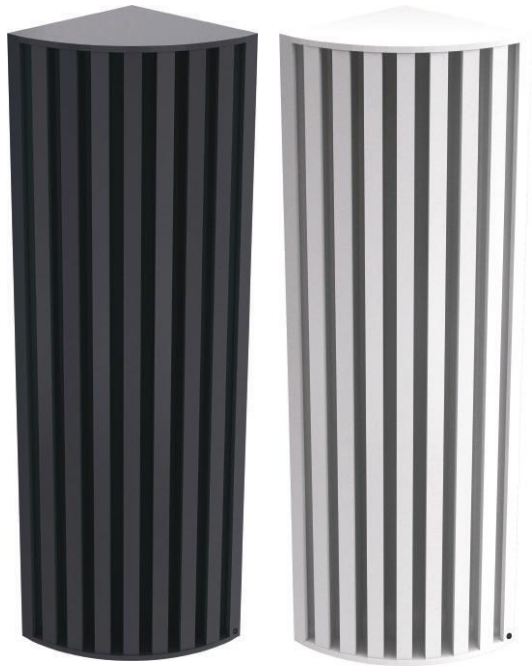




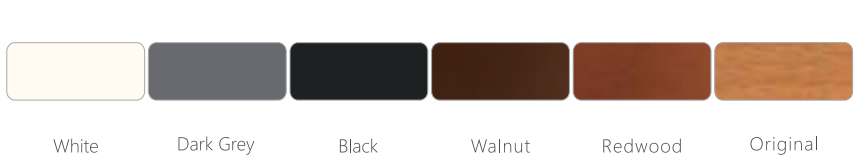


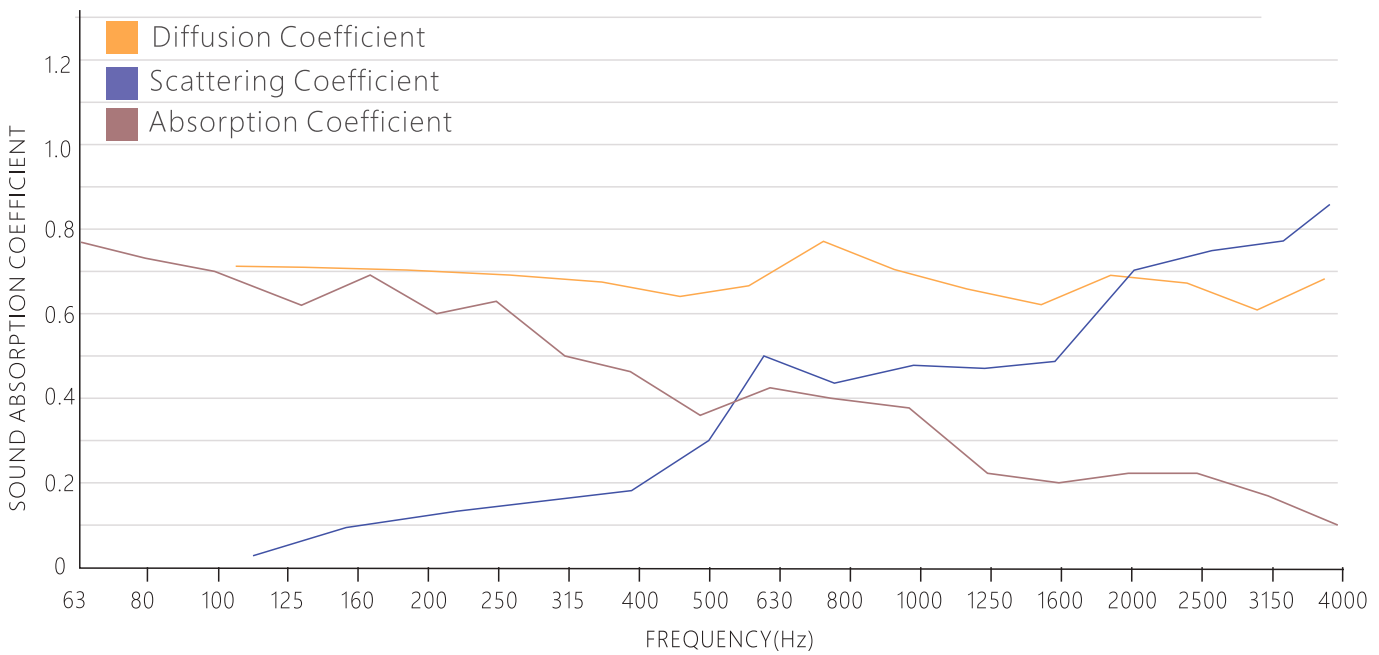


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Name: TRAPFUSER
Mosdel: D60W
Base material: Rubber solid wood
Environmental protection: Purely natural raw wood, natural and environment friendly
Finish: E0 standard environmental friendly PU finish paint
Features: D60W can be used to absorb the sound energy, prevent echoes and standing waves to realize diffusion in all the directions, and improve the articulation of sound. The diffusion frequency has a range of (80Hz-250Hz), reaching 63Hz to the minimum.
Scope of application: Opera houses, music halls, places of leisure, private theaters, recording studios, HIFI listening rooms, etc. with high end indoor sound quality requirements for building acoustic decoration
Specification: H1800*W450*D450mm
Weight: 32kg/pcs















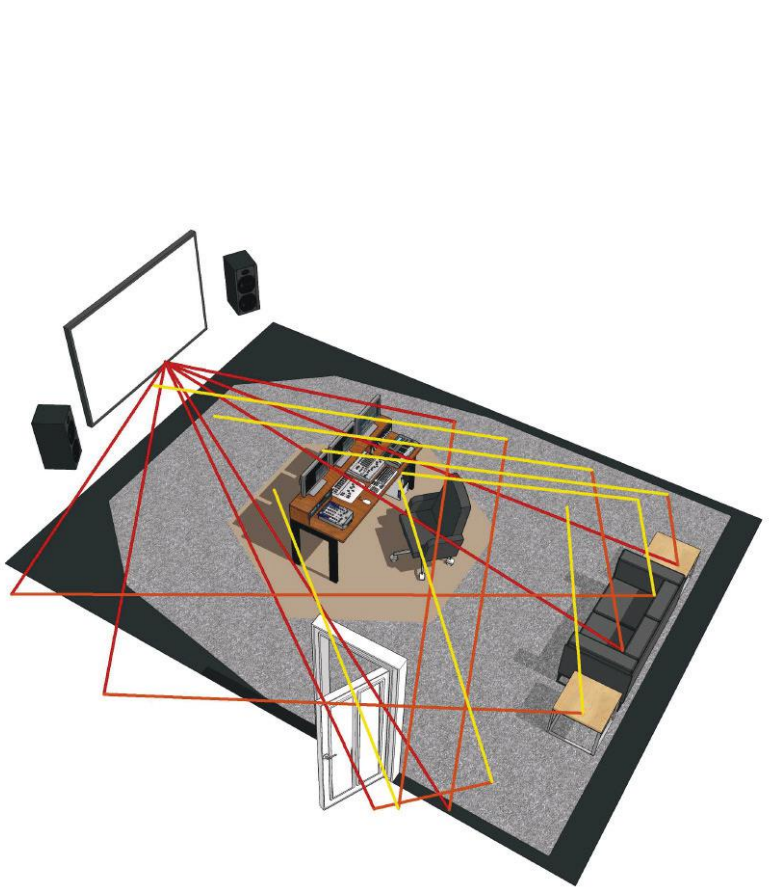
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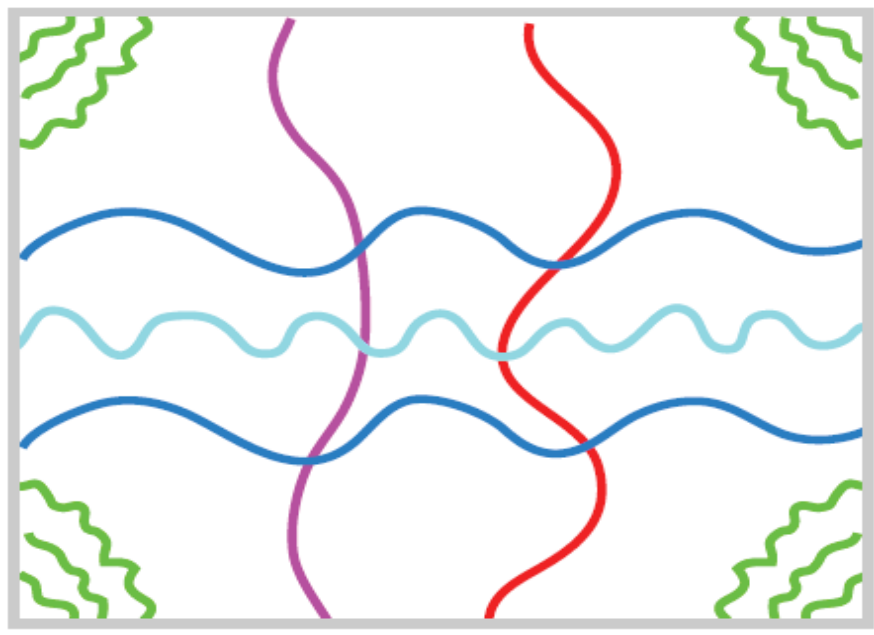
If only sound absorption measures are taken for building acoustic decoration works, the indoor space reverberation may totally disappear. Even if the sound sources are scattered at multiple points, the music or speeches still cannot reach some areas in the space, let alone the fullness of sound and sense of surrounding. The acoustic diffuser can diffuse the sound waves to create diffuse reflection of sound, help to reduce reverberation and improve the fullness of music.

In 1975, Schroeder, a German acoustician, proposed MLS diffuser based on a type of cyclic pseudo random sequence MLS in the number theory. MLS (maximum length sequence) is the largest length sequence in the binary system, commonly seen in error correcting codes and also often used in building acoustic measurement as the signal source of pseudo random noise. The MLS diffuser is composed of a series of concave and convex grooves with equal depth. The width of the grooves is determined by the MLS sequence, "1" corresponding to convex and "0" to concave. The design of MLS diffusion wall surfaces shall be based on mathematical calculations, and the results of the acoustic values as per the design scheme shall be measured in acoustic laboratories. In the audience halls of theaters, the acoustic diffusion wall surfaces are designed based on the MLS theory. The surfaces look irregular with concave and convex grooves, making the sound energy diffused and reflected as per the design requirement to ensure a uniform sound field in the halls to make the sound more agreeable.

Soundbox® three-dimensional diffuser is produced on the basis of the MLS theory as well as building acoustic design data for different functions, places and specifications and actual application experience, after numerous tests on monomer and polymer forms, acoustic data tests and reliability tests. It is made of GRP macromolecule engineering materials currently widely used in the world.

SonoCalm three-dimensional diffuser can effectively and uniformly diffuse the sound waves to all the areas in the space stereophonically to create a performance hall level acoustic environment without the need for any complicated acoustic design or high cost.





Direct sound from sources

Main reflections

Secondary reflections

Basic resonance wave

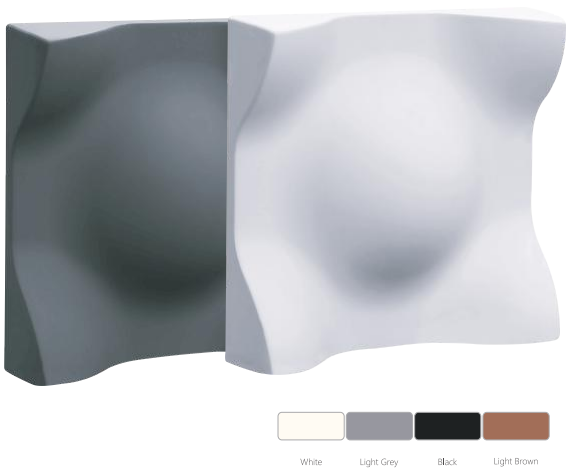
Harmonic wave of resonance wave

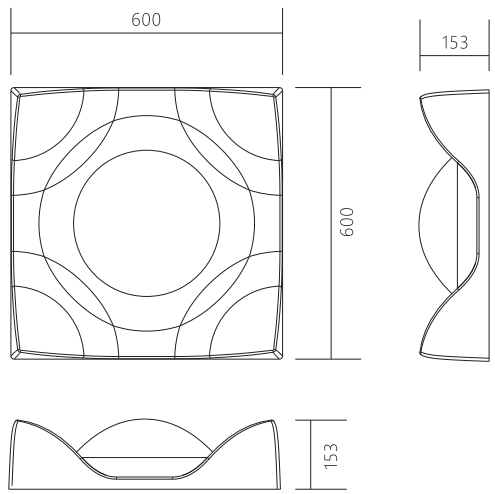
Echo effect from one side to the other

Rapid echo effect from one side to the other

Resonance waves in corners

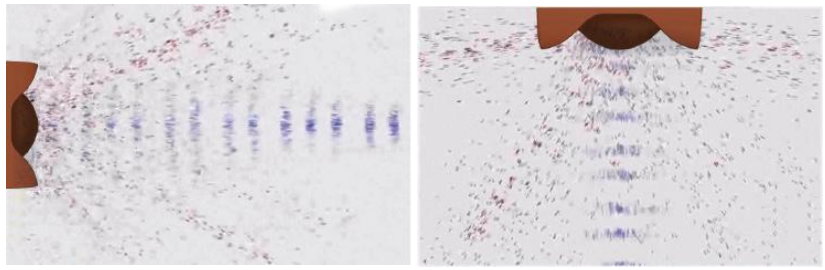
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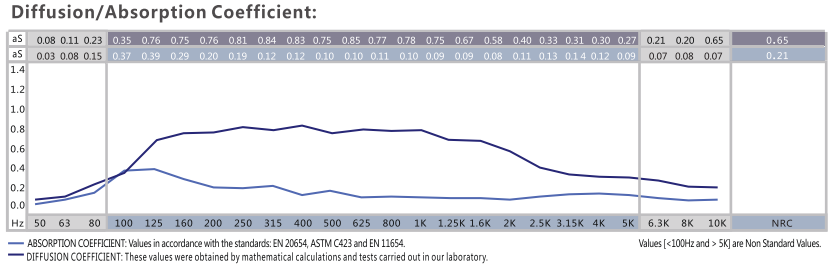


Name: Diffuser
Mosdel: PEAK 5Q
Finish: PU paint, water-based paint, flocking
Diffusion indicator: 0.57/m^2[> 100Hz- < 5KHz]
Size: H600×W600×D153mm
Environmental protection: 100% recyclable
Package: 2 pcs./box
Weight: 8kg/pcs

PEAK5Q convex diffuser redistributes the reflected sound energy. Though the re-orientation is not totally taken as the theoretical value for diffusion, the convex shape provides it good acoustic control performance to distribute sound more evenly. The 180°high efficiency radiation surfaces help to deal with the defect of acoustic shadow in the sound amplification system, which is difficult to be covered. Various 5Q combinations are installed on the background walls of the sound amplification system to form horizontal diffusion surfaces to provide a gain of sound energy equivalent to 3dB. It can be used together with EQ tuning boards to create diffuse reflection surfaces. As Q5 provides high efficiency acoustic shaping performance and strong visual impact, it is ideal for the facade walls in the sound amplification system with accumulative direct sound energy, and suitable for music halls, pubs, night clubs, KTV rooms, instrument practicing rooms, etc.



Diffusion/Absorption Coefficient:

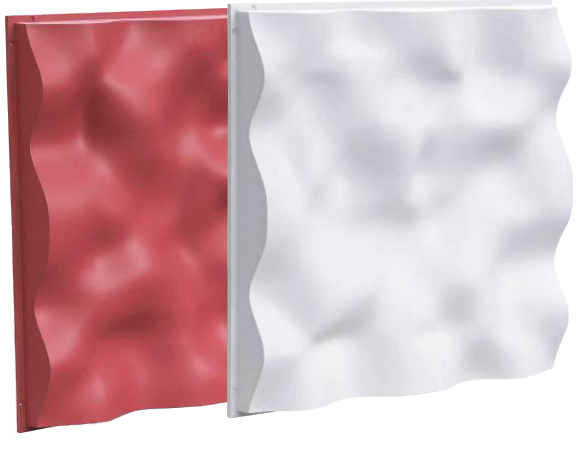


— ABSORPTION COEFFICIENT: Values in accordance with the standards: EN 20654, ASTM C423 and EN 11654.
— DIFFUSION COEFFICIENT: These values were obtained by mathematical calculations and tests carried out in our laboratory.

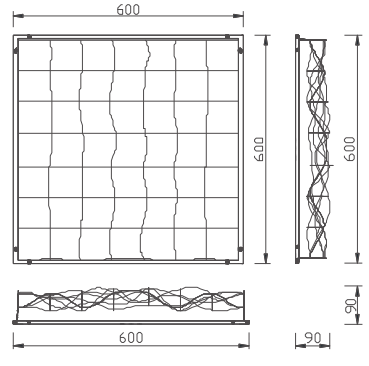
Values [<100Hz and > 5K] are Non Standard Values.



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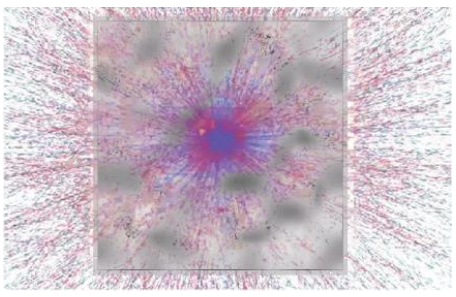
Name: Diffuser
Mosdel: CLOUD 2C / CLOUD 2C-LED
Diffusion indicator: 0.65/m^2 [>100Hz-<5KH]
Size: 600*600*90mm
Environmental protection: 100% recyclable
Package: 3pcs./box
Weight: CLOUD 2D: 5.6kg/pcs.
CLOUD 2D-LED: 6.2kg/pcs.

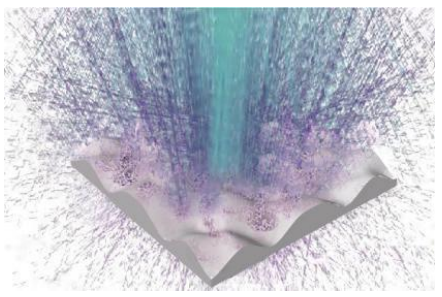


Cloufuser adopts a single asymmetrical base model with aperiodicity bass- relief wave form shape. The center uniformity design provides a natural drop through high and low frequencies.The square shape provide the combination of two cloufusers and become a symmetry reflector that keep integrality and continuity diffusion which center diffusion frequency on 1K.Cloufuser uses GRP material molding, A level fire resistance, E0 environmental protection, color selection and optional LED light star sky effect.
Cloufuser internal cavity combines with the ceiling cavity structure it can becomes a difference thickness lower frequency absorber.
CLOUD2C suitable for Home Theater, Auditorium, big size Office Room and Multifunction Room. Its acoustic feature and nice looking can effectively improve the sound space and provide a nice sound diffusion system. There are low power of 5W LEDs hidden in CLOUD2C-LED, effectively make a perfect integrity of imaginative and sound It's an easy acoustic system for home theatre, Club and KTV that combines acoustics and aesthetics.



White Light Grey Black Light Brown





Diffusion / Absorption Coefficient:

αS	0.01	0.01	0.02	0.09	0.19	0.19	0.20	0.29	0.32	0.43	0.49	0.51	0.53	0.60	0.61	0.64	0.52	0.65	0.82	0.80	0.83	0.72	0.72	0.63	0.65
αS	0.07	0.11	0.48	0.19	0.33	0.33	0.40	0.42	0.44	0.41	0.38	0.39	0.35	0.35	0.33	0.32	0.23	0.26	0.27	0.22	0.20	0.19	0.15	0.19	0.39
Hz	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	NRC

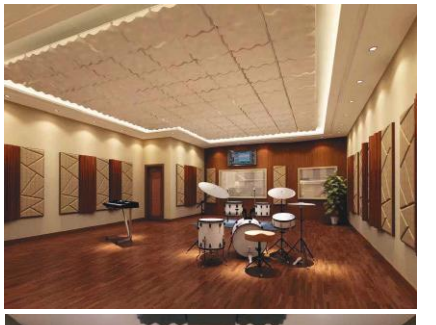
1.4 1.2 1.0 0.8 0.6 0.4 0.2

— ABSORPTION COEFFICIENT: Values in accordance with the standards: EN 20654, ASTM C423 and EN 11654.
— DIFFUSION COEFFICIENT: These values were obtained by mathematical calculations and tests carried out in our laboratory.
■ Values [<100Hz and > 5K] are Non Standard Values.







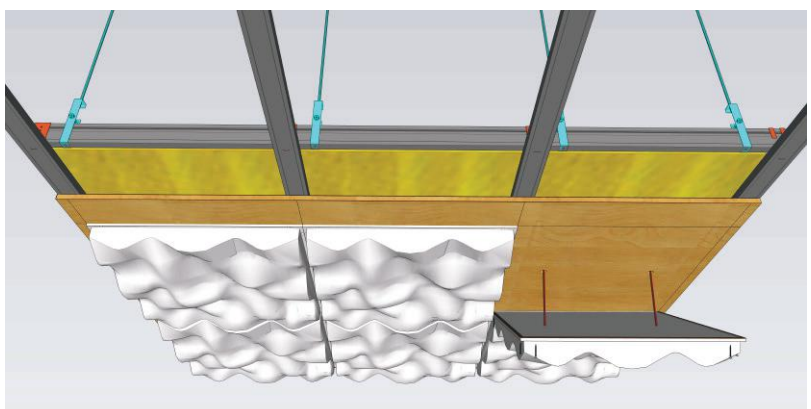




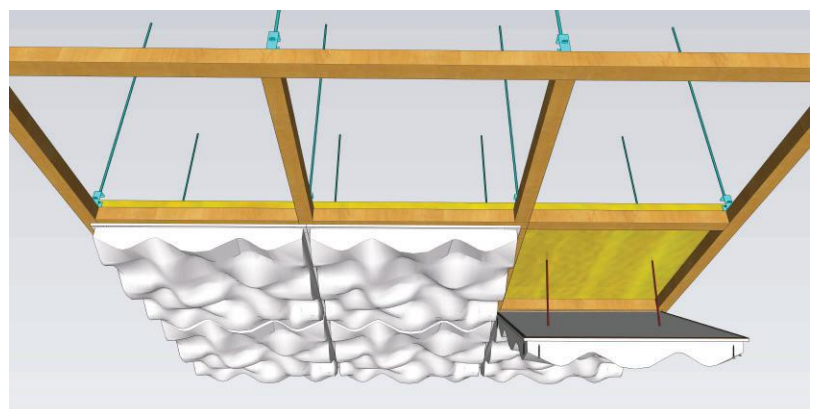


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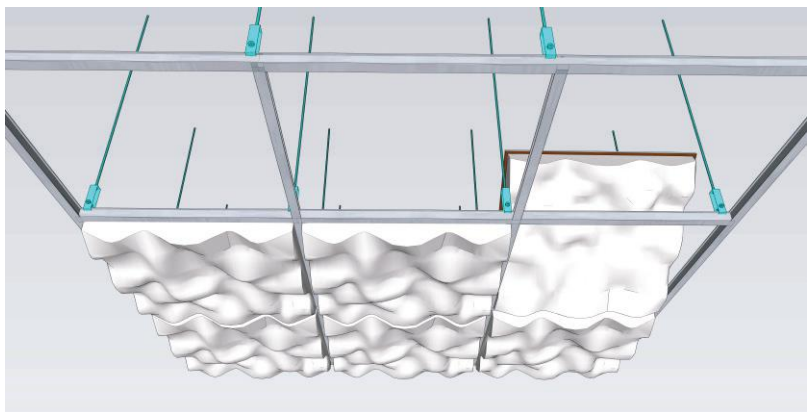
Cloufuser Installation



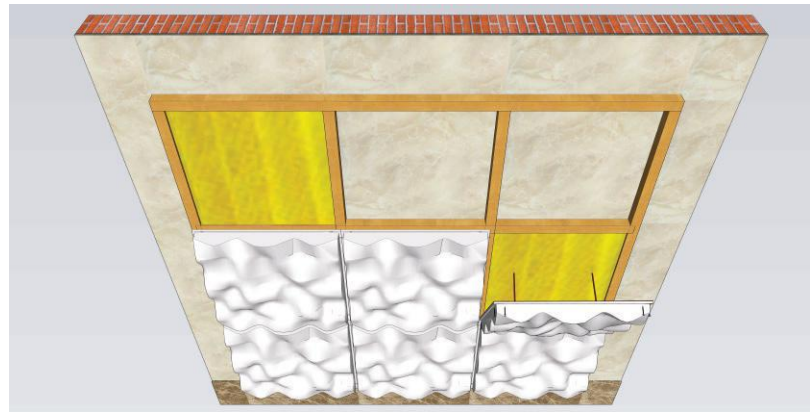
15mm thickness plywood on the base, and draft a size 600*600mm frame,filling 48kg/m3 rock wool backside cavity ,with EVA damping rubber on the bottom and 8pcs self-tapping screw to fix it for each panel,if with LED light,please do the 12 lower voltage wire at first
Base plywood betters for lower frequence below 125Hz diffuse , which apply for the listening room and small size private home theater.



Installation Method 2:
Installed on the size more than 40*60mm wood frame,keeping 600*600mm distance between keel's center,filling 48kg/m3 rock wool backside cavity ,with EVA damping rubber on the bottom and 8pcs self-tapping screw to fix it for each panel from center to all round .If with LED light,please do the 12 lower voltage wire at first)
Wooden frame cavity betters theater and bars bigger space low frequency and standing wave absorption as it helps to absorb frequency below 125Hz.

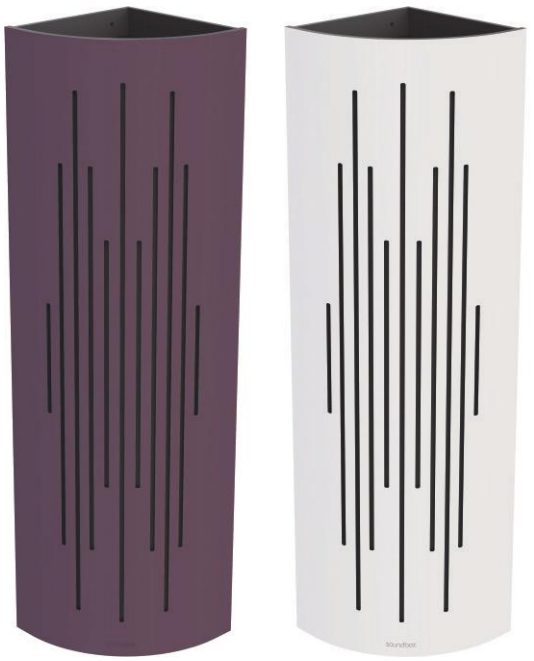


Installation Method 3: T-bar installation
Keeping is 600*600mm distance between keel's center. with EVA damping rubber on the bottom install it from the center area to all round . If with LED light,please do the 12 lower voltage wire at first.
As low cost of T-keels installation, it fits acoustic space demanding high frequency diffusion and low frequency absorption. for example, public places like churches.

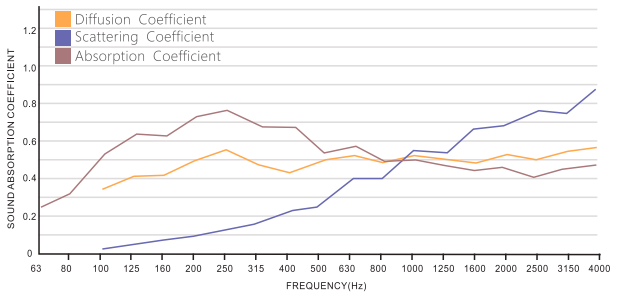


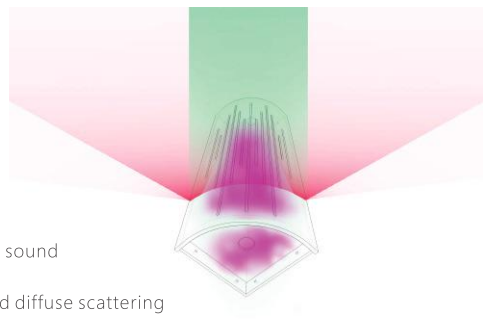
Installation Method 4: As for wood frame for wall, it is supposed to adopt wooden one which is bigger than 40X60 mm, keeping 600*600mm distance between keel's center,filling 48kg/m^3 rock wool backside cavity ,with EVA damping rubber on the bottom and 8pcs self-tapping screw to fix it for each panel from center to all round .If with LED light,please do the 12 lower voltage wire at first
Wooden frame in such structure betters bars and multifunctional halls low frequency and standing wave absorption as it helps to absorb frequency below 250Hz.

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Name: ARC diffuser (bass trap)
Mosdel: ARC 300W
Base Material: Carbon polymer composite material
Finishing: Hot coated PP finishing
Environmental rating: E0
Acoustic Properties: A 90°Curve diffusing surface using hot mold without glue with 20% different slot for absorbing broadband frequency. There's a triangle low frequency absorbing cavity inside, filled with green acoustic material to absorb standing waves at 250Hz effectively. At the same time, this cavity scatters the beneficial sound energy gathered on the corner. That is a way to minimize the consumption of sound energy from acoustic system.
Application: multifunctional hall, private cinema, recording studio, HIFI room and other high end space which needs to do acoustic decoration.
Scope of Application: Concert, Multi-functional hall, Private cinema, Studio and HIFI room and other high end interior acoustic decoration
Size: H1200/1500/1800 * W300 * D300mm
Weight: H1200≤11.5kg / H1500≤14.4kg / H1200≤17kg





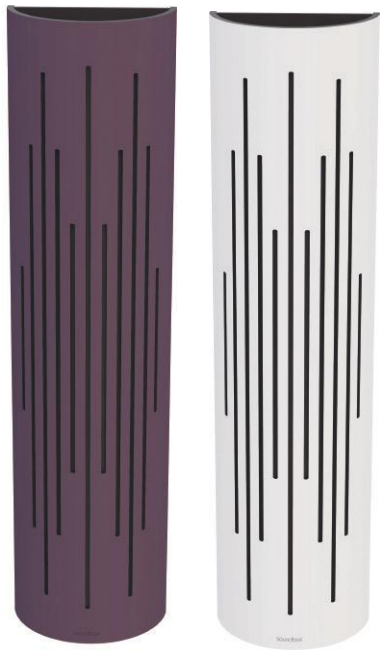








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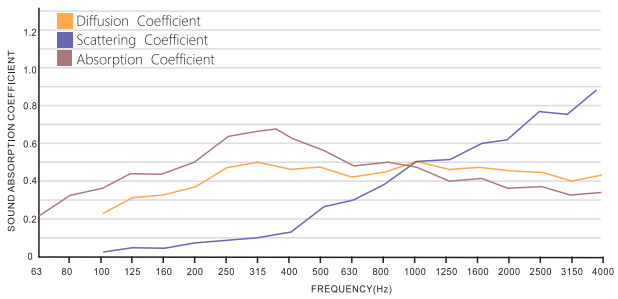


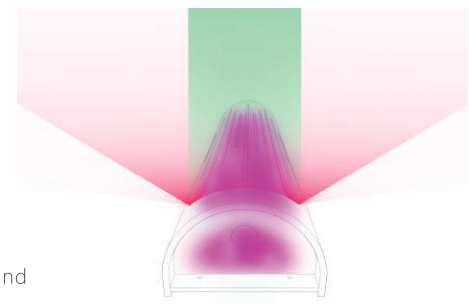


Name: ARC diffuser
Mosdel: ARC 300
Base Material: carbon polymer composite material
Finishing: hot coated PP finishing
Environmental rating: E0
Feature: A 180°Curve diffusing surface using hot mold without glue with 20% different slot for absorbing broadband frequency. There's unbalanced low frequency absorbing cavity inside, filled with green acoustic material to absorb margin sound below 350Hz effectively. The sound reflected will be fully diffused in certain directions. In this way, we do not only save sound energy consumption, but also obtain a relatively balanced acoustic environment.
Application: multifunctional hall, private cinema, recording studio, HIFI room and other high end space which needs to do acoustic decoration.
Size: H1800/1500/1200/600 * W300 * D150mm
Weight: H1800≤14kg / H1500≤11.7Kg / H1200≤9.23Kg / H600≤5Kg





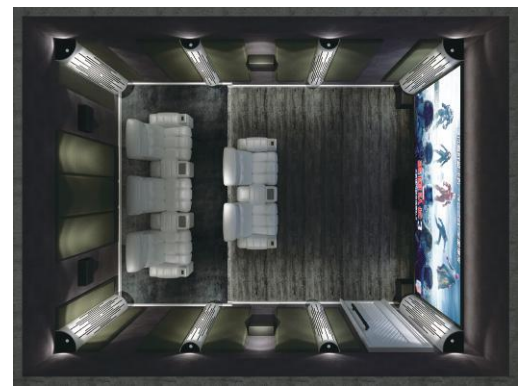




Direct sound

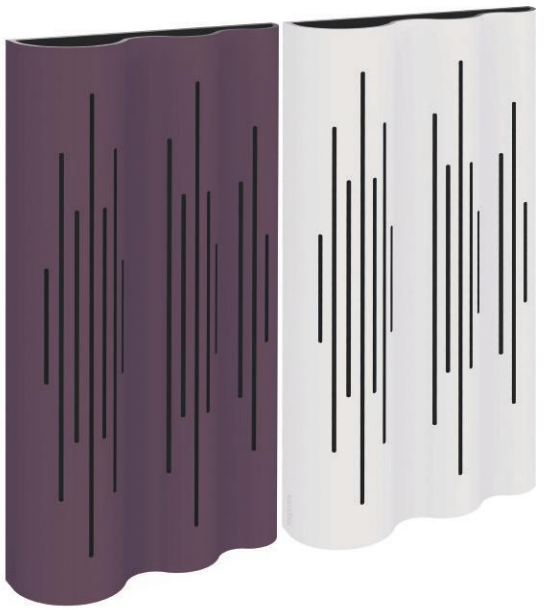
Spread diffuse scattering

Low frequency absorption



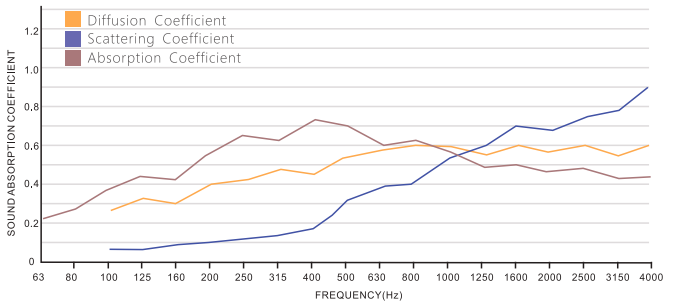


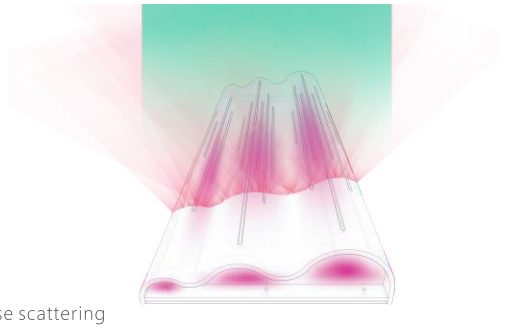
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Name: Diffuser
Mosdel: WAVE 600
Base Material: Carbon-plastic composite
Finish: Heating compound pp veneer
Environmental protection: E0
Features: Three wave-shaped diffusion with superimposed double-range bands. it has the function of sound absorption with 20% asymmetric design. It built-in low-frequency absorption cavities with three unequal volumes. To absorbing 550-250Hz low frequency, it landfilled with eco-friendly acoustic material. The MLS diffuser horizontally scatters and balances the reflected sound, so as to get a more uniform sound environment without losing sound energy.
Scope of Application: Sound quality decoration in high-end indoor spaces such as concert halls, multi-function halls, private theaters, recording studios, HIFI listening rooms, etc.
Size: H1800/1500/1200/600 * W600 * D160mm
Weight: H1800≤28Kg, H1500≤23kg, H1200≤19kg, H600≤9.5Kg







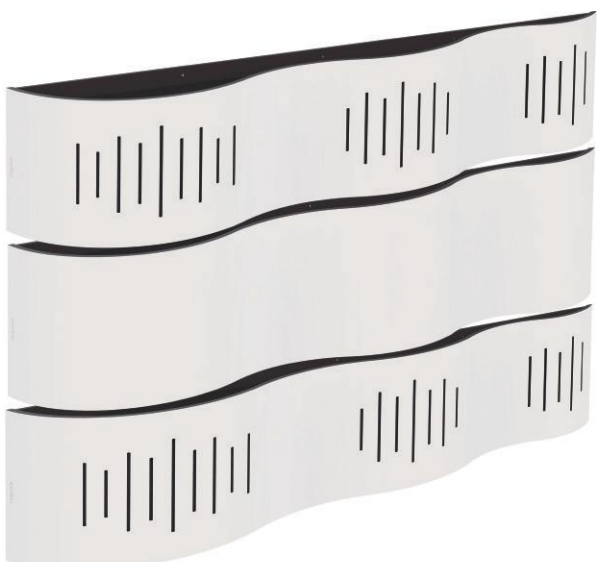








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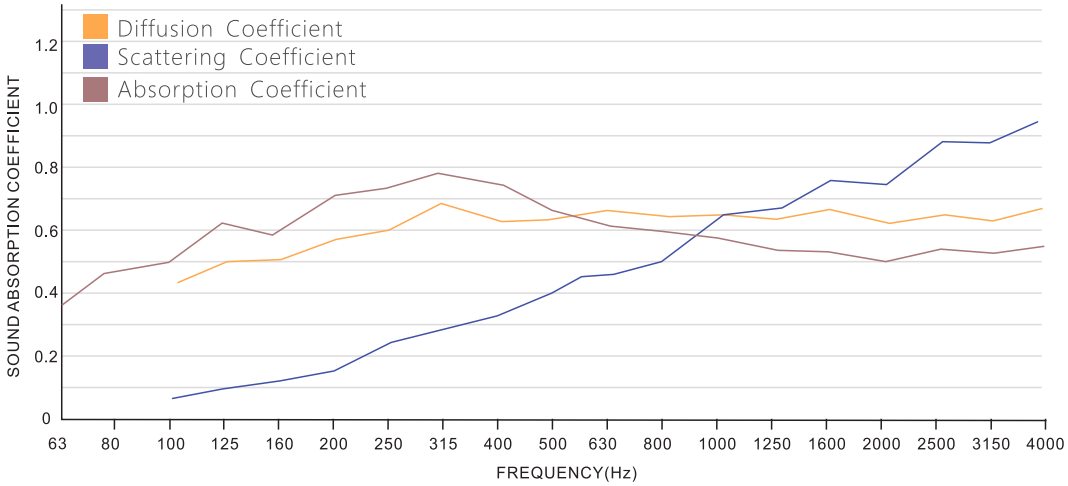


Name: Diffuser
Mosdel: PEAK 2000A / D （A-sound absorption & diffuser/D-diffuser only）
Substrate: Carbon-plastic composite
Finish: Heating compound pp veneer
Environmental protection: E0
Features: Three wave-shaped diffusion with superimposed double-range bands. it has the function of sound absorption with 20% asymmetric design. It built-in low-frequency absorption cavities with three unequal volumes. To absorbing 550-250Hz low frequency, it landfilled with eco-friendly acoustic material. The MLS diffuser horizontally scatters and balances the reflected sound, so as to get a more uniform sound environment without losing sound energy.
Scope of Application: Sound quality decoration in high-end indoor spaces such as concert halls, multi-function halls, private theaters, recording studios, HIFI listening rooms, etc.
Size: PEAK2000A H2000 * W800/400 * D200mm
PEAK2000D H2000 * W800/400 * D200mm
Weight: PEAK2000A W800≤42.5kg / W400≤32kg
PEAK2000D W800≤43.3kg / W400≤22kg



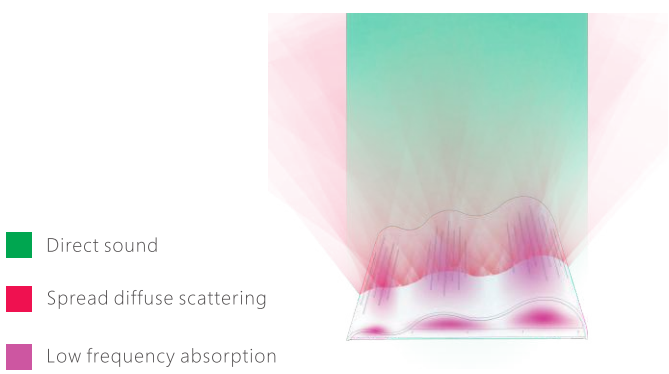
DS01 B201 DS05 DS06 ZP01 ZP04













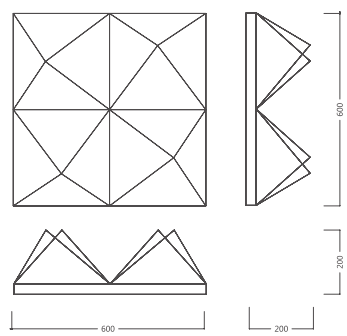
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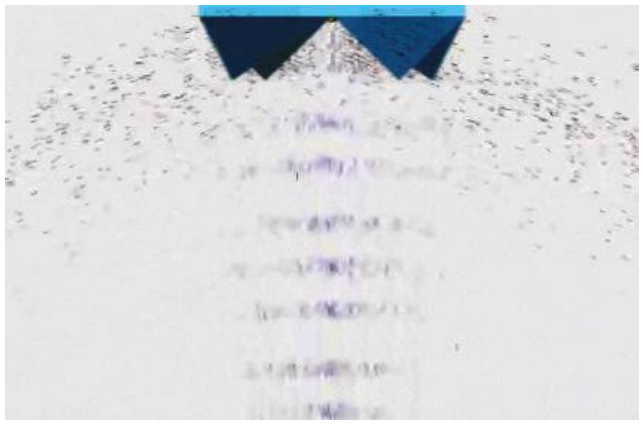


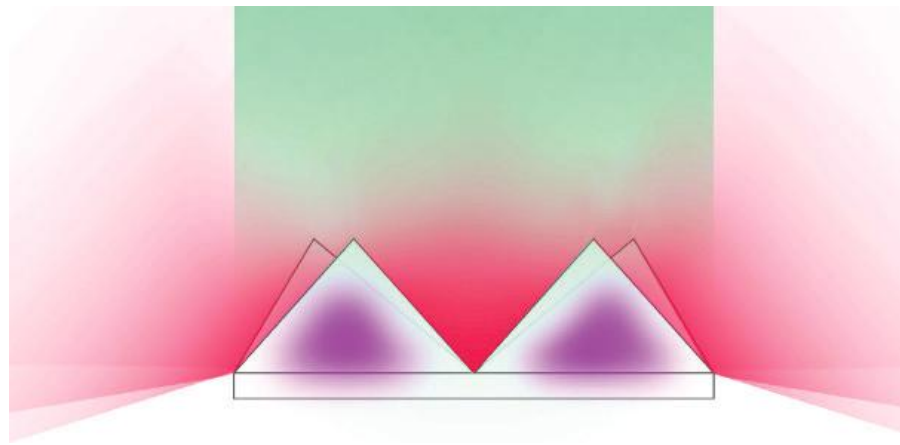
White Light Grey Black Light Brown

Name: Diffuser
Mosdel: PYRAMID 4Q
Finish: PU paint, water-based paint, flocking
Diffusion indicator: 0.57/m^2[＞100Hz-＜5KHz]
Specification: H600*W600*D200mm
Environmental protection: 100% recyclable
Material: HIPS
Package: 2 pcs./box
Weight: 4kg/pcs.



PYRAMID4Q conical surface diffuser follows the design of 1/4 unsymmetrical reflection phases. When the sound waves get in contact with the smooth PYRAMID4Q conical surface diffuser, the waves will be reflected in the planned directions instead of in all the same direction to effectively reduce the standing waves and sound flutter on the wall surfaces.Such a cavity under a non equilateral structure is able to absorb low frequency via diaphragm effect which effectively improve sound clearance. After the sound waves are reflected by the surfaces of PYRAMID4Q conical surface diffuser, the sound energy will be reflected in different directions with varied phase differences. Such irregular reflected sound with equal energy will provide a sense of space to the human ears, and increase the "brightness" of sound for diffusion of high and medium frequencies. The sound energy is reflected evenly in square double angles.





Direct sound
Spread diffuse scattering
Low frequency absorption

Diffusion/Absorption Coefficient:

aS	0.08	0.11	0.23	0.35	0.76	0.75	0.76	0.81	0.84	0.83	0.75	0.85	0.77	0.78	0.75	0.67	0.58	0.40	0.33	0.31	0.30	0.27	0.21	0.20	0.65	0.65
aS	0.03	0.08	0.15	0.37	0.39	0.29	0.20	0.19	0.12	0.12	0.10	0.10	0.11	0.10	0.09	0.09	0.08	0.11	0.13	0.14	0.12	0.09	0.07	0.08	0.07	0.21
Hz	50	63	80	100	125	160	200	250	315	400	500	625	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K		6.3K	8K	10K	NRC

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Product Parameters

Appearance	Name	Model	Unit load(KG)	Color	Surface size	Applicable
Φ4 Φ6/Φ8 	Rings	Φ4	≤30	Galvanizing primary color	Φ4*10mm	EQ3 Walleasear
	Rings	Φ6	≤80	Galvanizing primary color	Φ6*10mm	Walleasear
M6/M7 	Hanger	M6	≤60	Galvanizing primary color	60*25mm	
	Steel wire	Φ1	≤30	Black coated steel wire	Φ1*500mm	
Φ1/Φ2 	Rings	Φ8	≤120	Galvanizing primary color	Φ8*12mm	Wooden acoustic items
	Hanger	M7	≤80	Galvanizing primary color	70*30mm	
	Steel wire	Φ2	≤75	Black coated steel wire	Φ2*500mm	
T1 	Ceiling hanging tray	T1	≤10	Black	Φ 120 hanging tray, 3 steel wires, 2 sets of screws	Customized fabric acoustic items
T2 	Ceiling hanging tray	T2	≤12	Black	Φ 150 hanging tray, 4 steel wires, 2 sets of screws	Matrix fabric acoustic items
 80A 80B 50A 50B	Velcro	80A/80B	≤5	Black	Φ80	Walleasear Acoustic Panel
	Velcro	50A/50B	≤3	Black	Φ50	Walleasear Acoustic Panel
WS40 	Roller	WS40	≤30	Black	Φ40	Acoustic Baffle

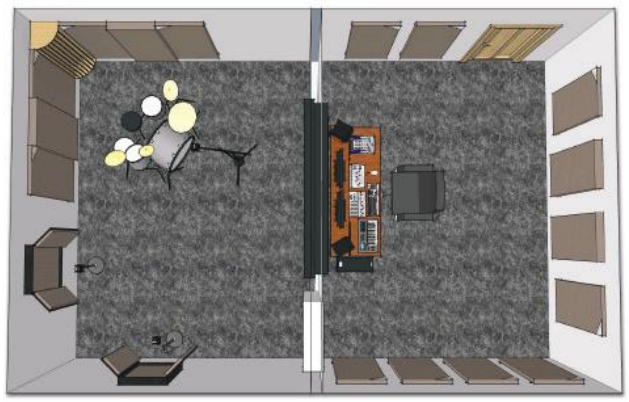
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Box type audio studio building acoustic treatment

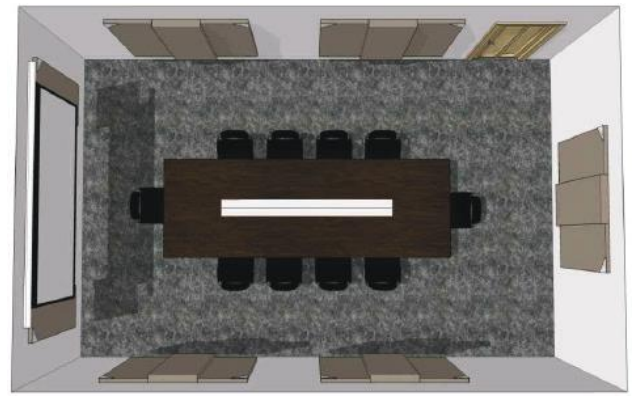
To control excessive low pitch sound

To absorb main reflections

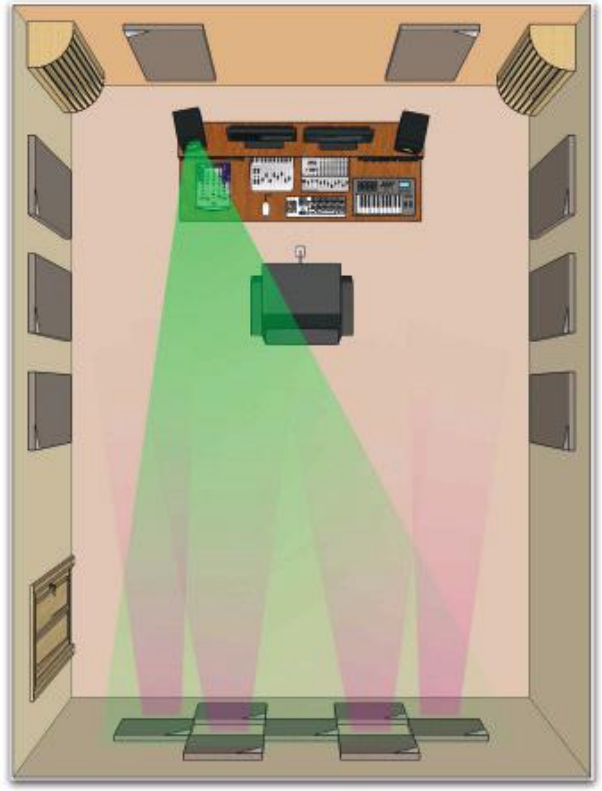
Easy to be installed, not requiring complicated construction work

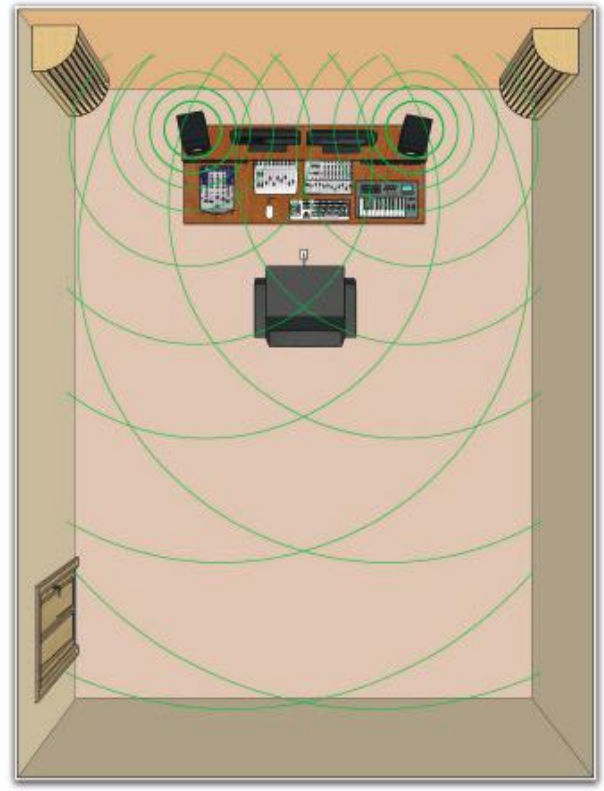












Room acoustic environment analysis

The main reflection echoes the sound reflected by the nearby wall and the ceiling to cause the strong superposed reflection of the studio. Because the sound reflected by the wall arrives slightly late, it conflicts with the original sound to cause phase offset. The effect influencing several frequencies is called comb filter effect.

Wherein, the strongest room main reflection adopts SonoCalm control column to be positioned at the ear level position at two ends. These measures reduce the reflection intensity to ensure that people immediately enjoy more accurate auditory space. Because the brain does not try to distinguish what are true sound source and reflected sound wave any longer, the problem of auditory fatigue will be effectively reduced.

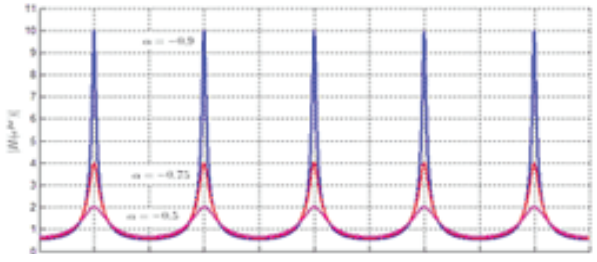


Early, the sharp difference that the sound is not completely absorbed at one end was designed indoors by Lud. Thus, a completely unnatural sound room was created.

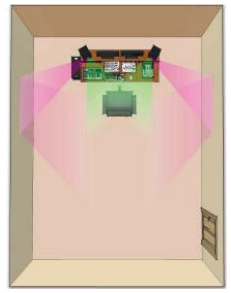


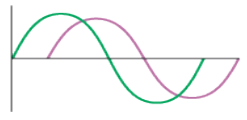
Now days, most of studios adopts the Lud variation theory to make sound absorption distributed evenly in the room.

SonoCalm sound combination adopts the absorption proportion of 60% to regulate on the front end background wall.



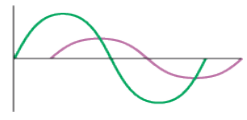
Comb filter





If treatment is not performed, the amplitude of the reflected sound is almost as loud as the direct sound source.





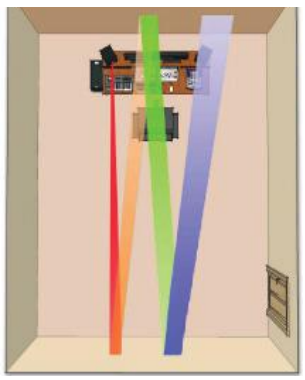
Main reflection of control column ensures the acoustic vibration amplitude to be easily reduced in the recording process.

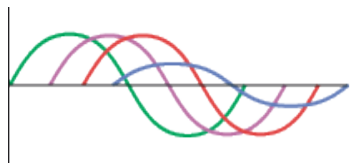
Flutter echo control

When you clap your hands in an empty room, you will hear the sounds of the wall, the ceiling and the floor to bounce and follow the echo. This is known as flutter echo or high frequency chatter. It is especially obvious in the parallel surface room, namely, it will echo the side surface, the ceiling and the floor from the front end to the rear end. When the echo of a room is too lively, how to effectively solve the reverberation or echo is a problem.

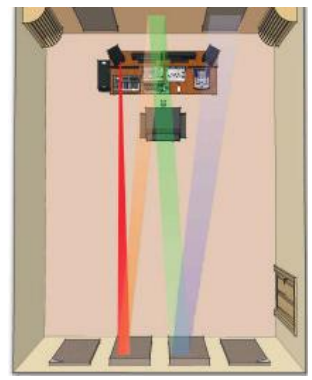
The multi-combination SonoCalm EQ50 broadband wave absorbing walls are distributed on the corresponding walls of the room, the broadband wave absorbing board controls the flutter echo from one side to the other side, the control column solves the problem from the front end to the rear end, and the scattered combinations are usually distributed on the panels behind the listening position.

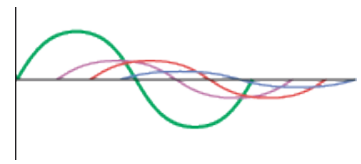
The random energy absorption effect is the key means of Lud room design. In the meanwhile, some energy sources are allowed to be reflected back to the room to keep the air sense and the





Scattering blocks are matched with other tuning boards to absorb the flutter echo and are helpful to reduce the standing waves.





All flutter echoes will cause the excessive reverberation and amplitude, so that the acoustic image is difficult to position.

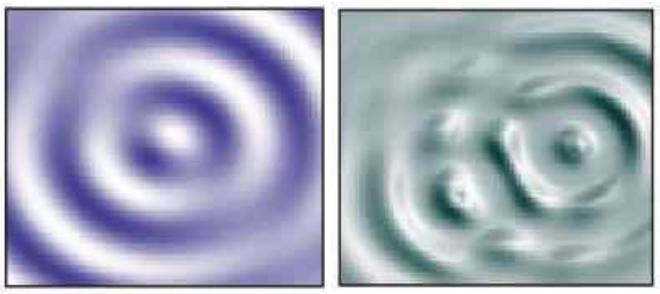
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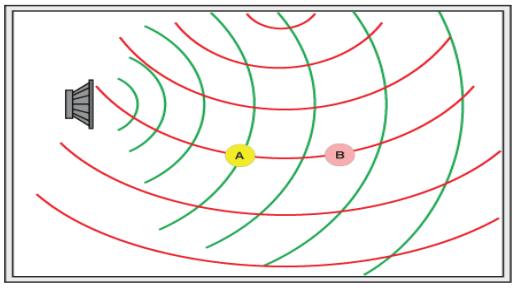
Room Mode

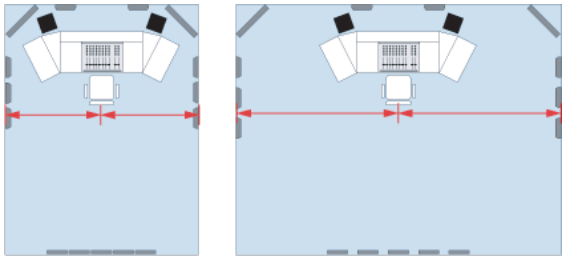
The studio owners often complain that their rooms sound good at the sound mixing position, but when they move in the rooms, a rumble occurs or low frequency completely lacks. This is a problem of room mode. One room mode can be regarded as a point where two low frequency sound waves collide in one room.

At the collision phase of two waves (illustration point), the modal peak value responded in a room amplifies mutually. At the collision phase (point B), the two waves form a modal space to be offset mutually. Although the room mode occurs at all frequencies, the sound in the bass range may seriously influence the bass response of our room.

In order to solve the bass problem, two SonoCalm broadband wave absorbing boards are installed at the corner with the problem. It will form a deep empty board back low frequency trap of 43 cm to effectively absorb the bass to the low frequency of 100 hz and below, and thus the low frequency attenuation and the modal interference will be effectively reduced in the room.







When the indoor area boundaries are close, the room with higher absorption degree has priority. With the outward sound expansion, the energy is transmitted and reflected to the listening area.

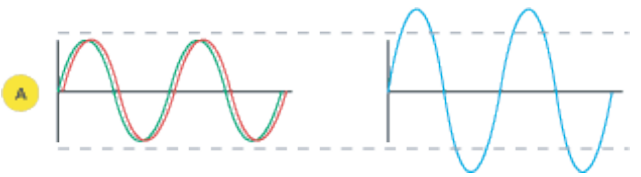
Adaption to spaces with different sizes

One of the most attractive characteristics of SonoCalm EQ50T is wide utilization capacity in the rooms with different sizes.

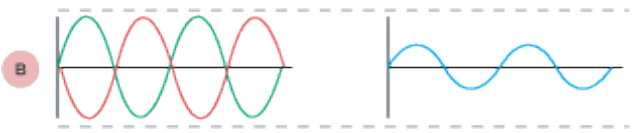
In the smaller room, the walls are close to cause strong reflection, because the sound energy is reduced with a natural degree and the sound is further propagated from the source.

In the larger room, the sound is further propagated. The sound hitting the boundary to be reflected back includes less energy. Thus, we can use less panels to control reflection.

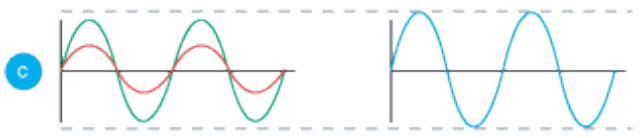
We should note that the sound of a room is a personal preference. Some sound engineers would rather choose the strongly mixed space rooms, but the other sound engineers prefer the higher level sound control rooms. With the development of more and more audio studios, you can find the small differences of medium absorption on your room's tuning board combinations. The room will sound more natural to present a more typical listening space.



Collision phase of two waves=modal peak value



Collision out-of-phase of two waves=empty mode



The impact with room response is less after treatment.

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The first picture shows the competition between the initial direct sound (green) and powerful first-order reflection and reverberation field in a typical auditorium. The audience must try once to understand what you are talking about and try to or "turn off" the sounds from the other rooms.

The second picture looks denser. The direct sound of the loudspeaker reaches the given range (sound pressure level), and the first-order reflection lags, because the travel distance of the sound must be farther.

The third picture shows the effective sound absorbing board, because it greatly reduces the reflection amplitude. The low noise interference information and articulation are greatly increased.

Aiming to problematic frequency
This picture shows the frequency range of the typical male voice. Obviously, it is the energy mostly in the voice range of 300Hz to 2000Hz.
Our language communication is generally within this range. Obviously, we have substance to emphasize to regulate the sound frequency band of this range.
In other words, the thing that we most regard is to control the sound reflected sound range, so to select the sound absorbing board for absorbing the energy sound should relate to the sound range of this domain.

Well, loud voice, quizzing voice, communication voice, leisure sound
Frequency and amplitude of the second superposed voice range vs absorbing performance
Q600R broadband wave absorbing wall. The relative sound will be effectively absorbed by the panel installed in the room. Obviously, EQ600R broadband wave absorbing wall is very suitable for the broadband sound energy.

Although there is a theory to explain that the longer reverberation decay time will improve music, it is only applicable for part of classical music instruments. For example, the sound of the chamber music is the best in the echoed space.

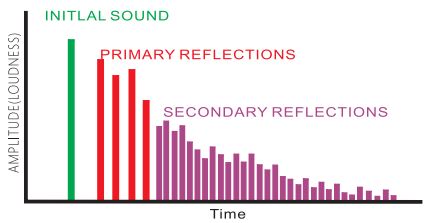
However, in consideration of solving the differences among the electronic drum, the bass and the electric guitar for musical performance, the low frequency is easy to absorb by increasing more sound absorbing boards (covered on the surface) and using the thicker absorbing materials. This picture shows the difference between SonoCalm the thicknesses of 50 mm and 75 mm. The energy absorbed by the panel with the thickness of 75 mm is reduced to 125Hz. The density of the absorbing panel should be regarded, that is the key.

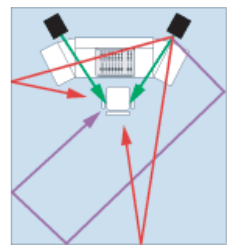
If the air cavity is arranged at the back of the panel, the low frequency absorption ratio can be further increased, especially EQ600R and EQ600T are suitable for this function. The thicker EQ600R broadband absorbing boards are usually applied to the main reflection wall, and EQ300R control columns are often distributed along the wall. If the longer reverberation time is required for chorus performance, reverberation can be controlled by moving the sound absorbing panel to be easily reintroduced into the room, thereby reducing the cost of the electronic equipment.

The most important goal of the room acoustic treatment is to establish a neutral listening space.
So the quality of hardware and software should be ensured in the audio recording process to replay the audio frequency to the car audio, the family entertainment system and the radio, etc. Most of the residential or commercial rooms adopt the rectangular parallel walls. It means that these rooms will suffer from strong reflection, flutter echo, standing waves and resonance. Happily, we know the existence of these problems and we can predict what will happen and establish the solutions.

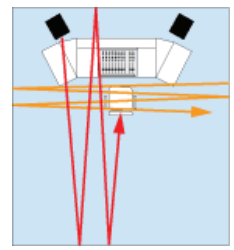
Using SonoCalm sound combination does not mean that you can make the bedroom favorably compare with the professional audio studio established by spending millions of U.S. dollars. However, what we can do is to make a poor altisonant room become a very practical recording space. It will help you obtain the conditions for finishing the audio work. This page explains how to use SonoCalm sound combination to establish your sound room.

From initial sound to strong first-order reflection. Then the reverberation field is established. Ss time goes on, the sound in the room rebounds.

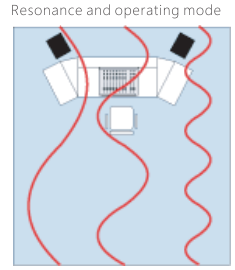




Parallel wall



Resonance and operating mode



SonoCalm Lud room variation theory

Today, most of studios adopts the Lud variation theory to make sound absorption distributed evenly in the room. SonoCalm adopts 60% absorption at two ends. Early, the sharp difference that the sound is not completely absorbed at one end was designed indoors by Lud. Thus, a completely unnatural sound room was created.

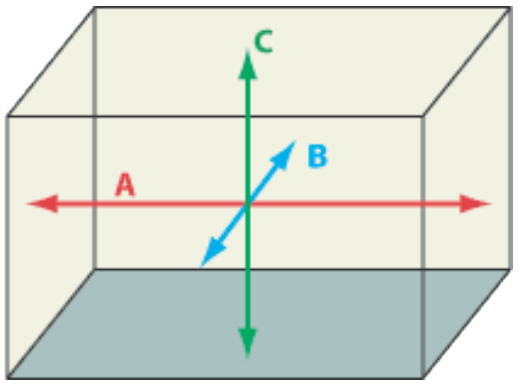
In the past 20 years and up to today, for the design of the studio control room, the Lud variation design concept is continued to be used, SonoCalm main reflection is used for strong absorption treatment on the main left and right sides at two ends of the listening zone of the concept design room. The wall opposite to the loudspeaker and behind the audiences are used for variation sound absorption. The proper favorable reflections are deliberately left at the interval for the installation position of the absorbing board, which is helpful to increase the sound sense of the sound environment to balance the location behind the listener.

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Soft diffusion

Lud room design ensures that more sounds are absorbed at two source ends of the room and a more vivid variant is left on the front surface end. It will create an air sense or a space sense that people feel more natural in the room.
SonoCalm scattering block provides a solution for effectively replacing the high-cost diffusion material and ensuring the generated equivalent effect. We call it soft diffusion. The panels of tuning boards of EQ50T control column are strategically distributed in the room to absorb the corresponding energy. In the meanwhile, part of sound wave energy is allowed to be reflected to the receiving end of the room.

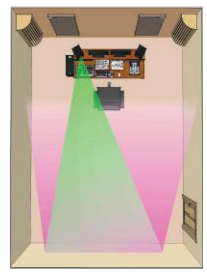
It is helpful to control the flutter echo and reinforce the sound space effect, for example, reverberation is easy to blend with the echo.



A $\frac{1130}{12\ ft} = 94Hz$

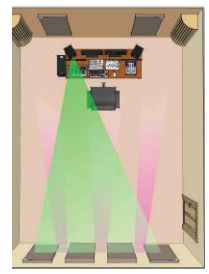
B $\frac{1130}{10\ ft} = 113Hz$

C $\frac{1130}{8\ ft} = 141Hz$



■ Monitoring sound

■ Untreated backwall reflecetion



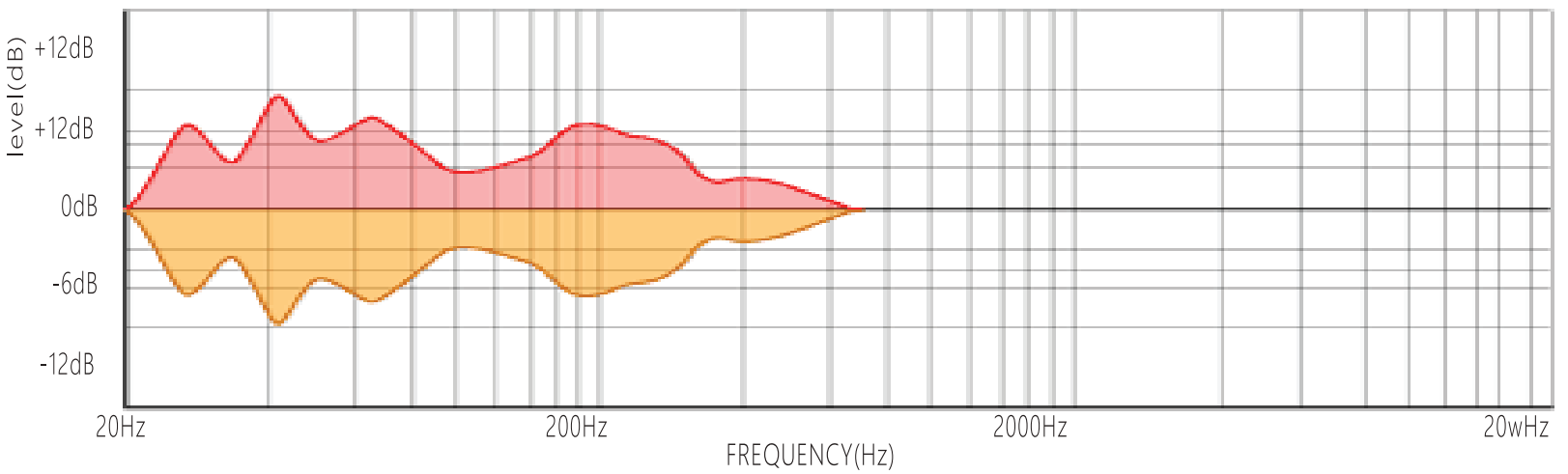
■ Mornitoring sound

■ Treated back reflection

The red area shows the resonance effect of the frequency response in the room. The orange area shows how to balance the recorded sounds. When the recorded sound is played in another system, it Since most of rooms adopt the square or rectangular parallel walls, the sound will echo from one parallel wall to the other parallel wall and then transversely echo again. The sound is called flutter echo at higher frequency and called resonant frequency or standing wave at lower frequency.

The sum of the wavelength of each frequency and the sound (1130 ft/s) speed is divided by the distance between the parallel surfaces, and the basic resonant frequencies which can be calculated are in one room. For example, for the room with the ceiling area of 10'x12'8", the waves with the resonant frequencies of 113Hz, 94Hz and 141Hz and their harmonic waves are very suitable for resonance in the room. Thus, besides 113Hz, there are other resonant frequencies, such as 226Hz, 339Hz, 452Hz, etc. Whether these frequencies generate resonance depends on where you sits, and louder sound may occur. Unless you treat it, you will naturally reduce it within your balance. Finally, when your record is played again, you will find that these frequencies lack. This is a bass control problem, and is one of the very important reasons.

Resonance should be reduced as far as possible to establish a more neutral listening environment. This is the utilization advantage of Howeasy tuning acoustic board to absorb and even extend to the lower frequency area.



The red area shows the resonance effect of the frequency response in the room. The orange area shows how to balance the recorded sounds. When the recorded sound is played in another system, it sounds like the orange curve and may have inconsistent bass.

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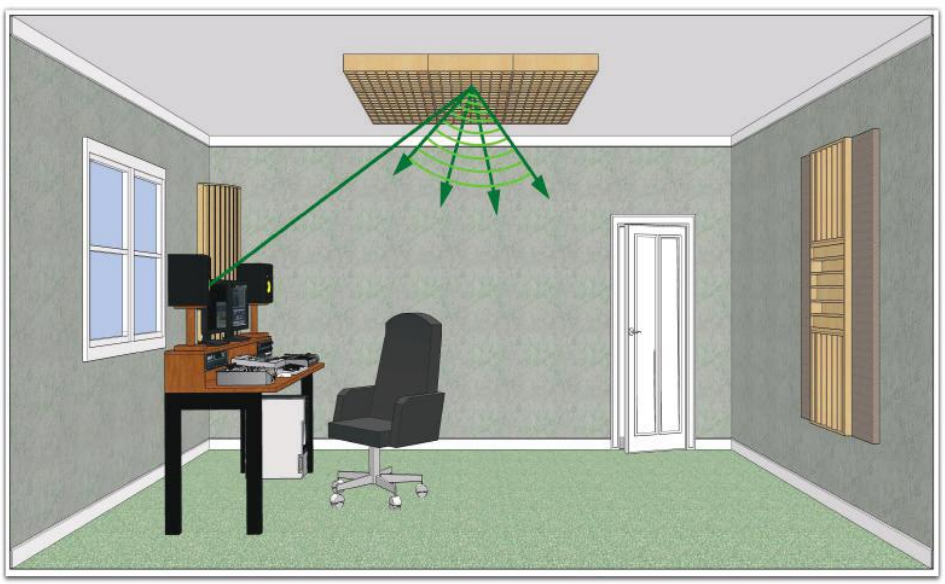
Architectural Acoustics

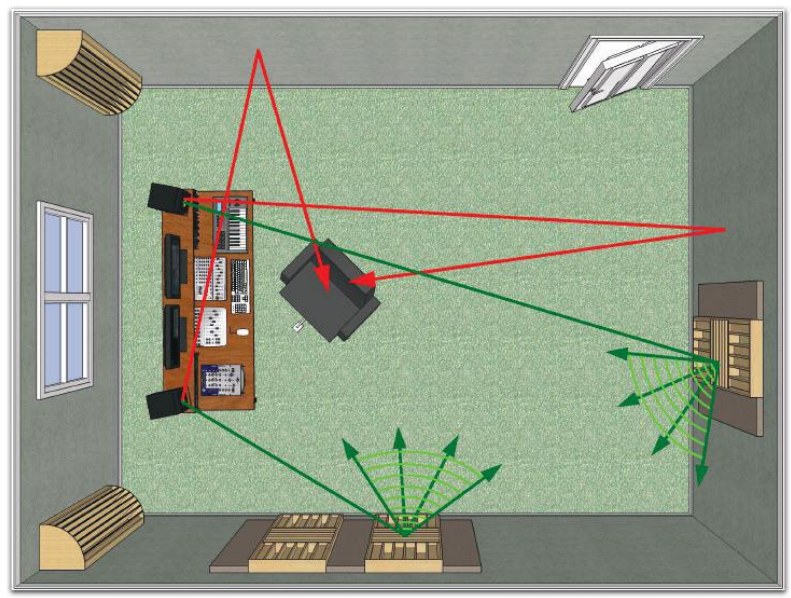
The relationship between Reverberation and Diffusion

The main interest in architectural acoustics research is to analyze the reverberation process. Using the statistical model to analyze the sound field it is customary to describe the reverberation room measurements as a diffuse sound field. This shows that the diffusion has a close relationship with the reverberation. For example, in a balance sound field, one of the important features is that the sound source stopped but the reflections continue. This is called reverberation. The conception that the diffuse field can be defined as the superposition of an infinite set of plane waves is used as starting point for a model sometimes referred to as the free-wave model. The main assumption here is that certain quantities of the constituent plane waves are additive. This assumption implies a simple technique: the quantity under consideration is computed for a single plane wave, and the corresponding expression is averaged over all directions. A diffuse field is one in which there is an equal energy density at all points in the room. This implies that there is an equal probability that sound will arrive from any direction.

If a space is non-diffuse, for instance if the absorption is not very evenly distributed or the dimensions of the space are not very similar, then applying diffusers to the space will have a number of effects. In the case of very disproportionated rooms, such as underground stations, the reverberation time will decrease when diffusers are added, because the mean free path is reduced, giving more absorption from the increased number of reflections per second. In the above analysis, it contains the basic concept of geometrical acoustics. The basic assumptions are that energy density is uniformly distributed in space, and that energy flow is isotropic. Essential concepts are absorption coefficients and power flux incident on surfaces. Diffraction effects are ignored.

Models describing a diffuse sound field in a reverberation room cannot be drawn in any strict sense, like the corresponding model of the wave theory, the normal mode model; they are based on postulated properties. Reverberation has an important influence for the room's tone and becomes its necessary condition.





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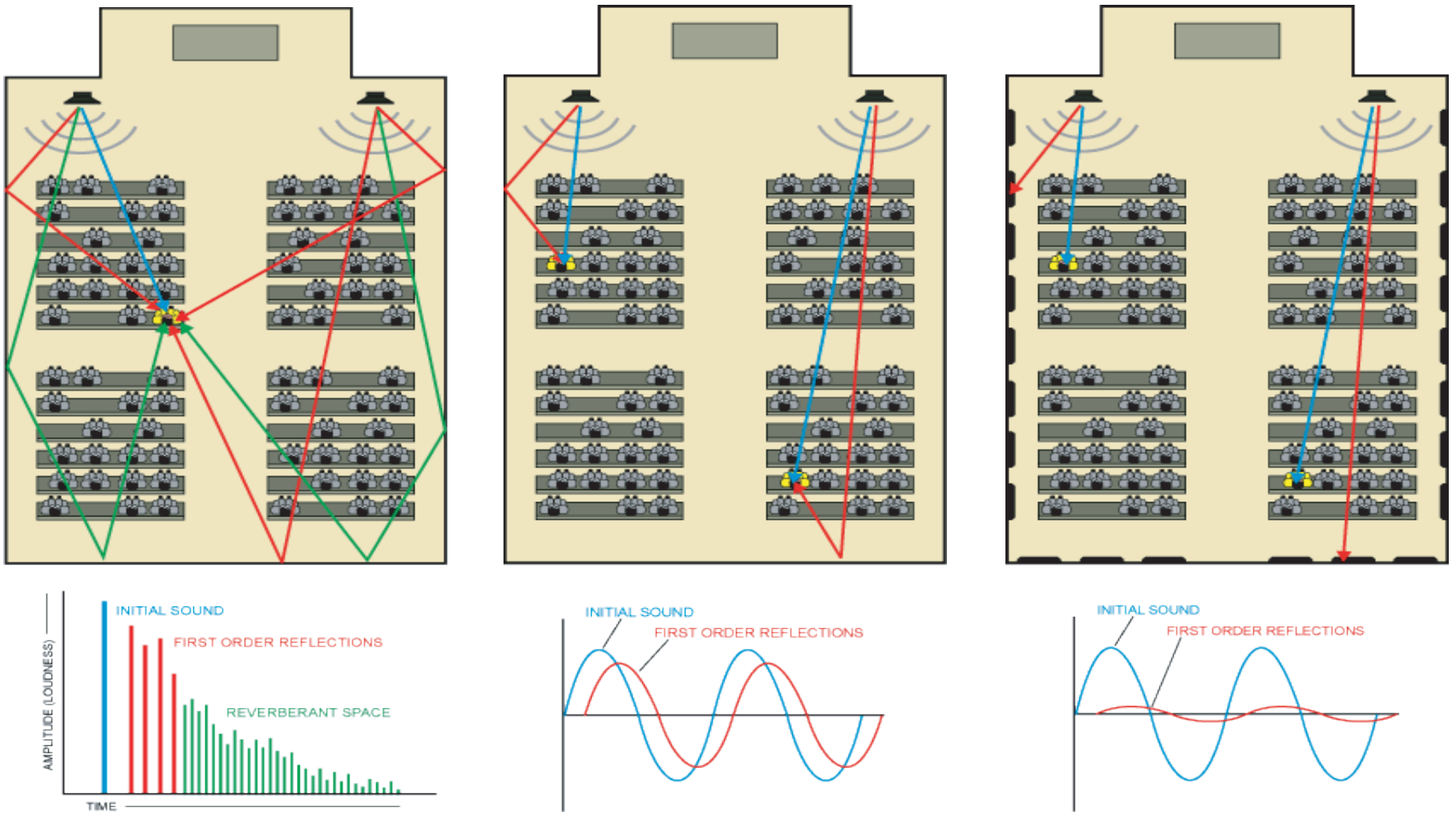
Halls sound environment

Sometimes, one of the largest misconceptions is that the problem can be solved by purchasing the high-end sound system. In fact, if the acoustic environment in the hall cannot be correctly constructed, you will find that the problem becomes worse after you spend a lot of sound replenishment cost.

In most cases, the solid surfaces are used for the decoration construction of the larger hall. The stone decoration wall, the gypsum board wall or the concrete wall can be found everywhere.

These hard surfaces ensure that a dense reverberation field is created for sound reflection and the decay time can be more than 5 seconds.
When you increases the volume in a highly reverberant space- the sound will become excessively active and far exceed the capability of room to naturally consume the energy. The endless rippling echo elongates reverberation to make the sound become an annoying nightmare.

Therefore- the key point is to reduce the sound field reverberation to effectively improve the articulation of room and hall- Ideally the reverberation decay time must be reduced to be less than 1 second- In other words- the lingering sound should be fastly dissipated after you clap or applaud once.



Theater sound environment

General requirements

- The architectural acoustic design of the cinema should provide the appropriate audience hall acoustic conditions for film playback.
- In the acoustic design of the cinema audience hall, the space for arranging the screen should be regarded as a whole to
- consider. The cinema audience hall should not be provided with the balcony.
- When the film is played back, the audience hall should have good articulation everywhere to really restore the sound playback effect.
- When the film is played back, the audience hall should not have the defects such as echo, multiple echoes, flutter echo, sound focusing and resonance, and should not be disturbed by the equipment noise in the cinema, the noise from the film projection booth or the outside environment noise.
- Contour requirements of audience hall
- The length of the audience hall should not be more than 30 m, and the ratio of the length and width of the audience hall should be (1.3 ~ 1.7) : 1.
- The volume of each seat for the audience hall should be 6.0 ~ 8.0 m^3. (Note: the volume includes the space for arranging the screen when being calculated)
- The flutter echo caused by the arrangement of surrounding loudspeaker on the side wall should be prevented in the design of the cinema audience hall.
- The measures for preventing the echoes should be taken on the rear wall of the audience hall.
- The strong sound absorption treatment should be performed on the end wall behind the main loudspeaker group. The average sound absorption coefficient is within the frequency range of 125-4000Hz and should not be less than 0.6, and the sound absorption coefficient should not be less than 0.4 at 125Hz.
- The installation position and requirements of the loudspeaker group should be considered for the interior decoration of the audience hall. When the loudspeaker makes sounds, the bracket and the surrounding structures of the loudspeaker should not generate the vibration noises.
- Reverberation time of audience hall
- The selection of proper reverberation time for the full audience hall should conform to the following regulations:
- When the frequency is 500 ~ 1000 Hz, the proper reverberation time range for different volumes as shown in Figure 1 should be adopted.
- The stereo cinema audience hall with the volume less than 500m^3 should adopt the proper reverberation time range the same as that with volume of 500m^3.
- The reverberation time and frequency characteristics should meet the regulations in Table 1 compared with the ratio of 500 ~ 1000 Hz.
- The estimation of reverberation time should be performed respectively at six frequencies of 125Hz, 250Hz, 500Hz, 1000Hz, 2000Hz and 4000Hz. The estimated values should be double-digit effective values.

Figure 1 Range of proper reverberation time T for full cinema audience halls with different volumes V at 500 ~ 1000 Hz

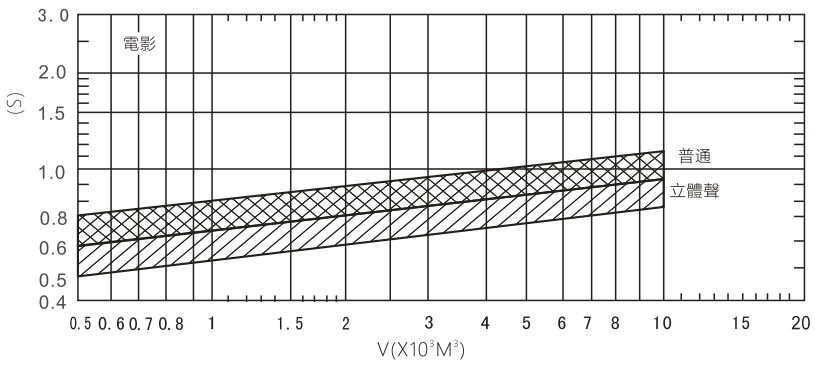


Table 1 Ratio of reverberation time of each frequency for cinema audience hall relative to 500 ~ 1000 Hz

Frequency(Hz)	Reverberation time ratio
125	1.0~1.2
250	1.0~1.1
2000	0.9~1.0
4000	0.8~1.0

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Sound studio (room) to build the design requirements

(recording studios and studio name, traditionally general larger space called "tent", smaller space called a "room")

Studio is a kind of functional Spaces with demanding, sound environment requires shorter reverberation time and lower levels of background noise level. The studio acoustic requirement is to ensure that the language is clear, no distortion, noise interference from the outside world. Quality is mainly "language clear, high intelligibility, followed by good fullness", under the condition of main use, has the corresponding to the requirements of the pickup reverberation time and frequency characteristics of inhibiting effect pick up sound quality defects, such as echo,
fibrillation echoes, low frequency and buzz, in accordance with the requirements of the design index of the studio to recommend appropriate USES short reverberation, choose suitable
reverberation time according to interior volume, flat frequency characteristic of the reverberation time requirements.

According to the recording content, studio can be divided into two categories, music recording studio and language recording studio.

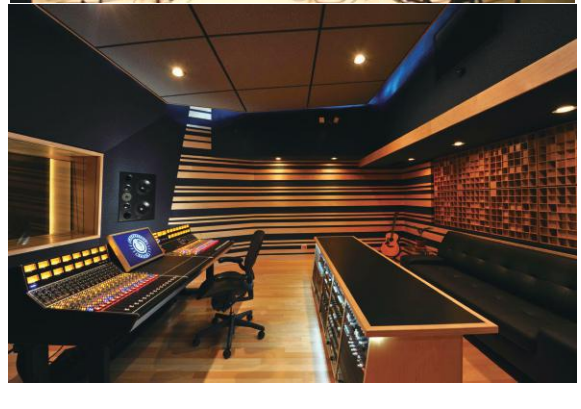
Music recording studio and can be divided into four kinds: 1, natural reverberation studio; 2, strong absorption multichannel recording studio; 3, strong absorption and combination of natural reverberation studio; 4, multi-function music studio

Language studio (room) and can be divided into: dialogue recording studio, a variety of types, dubbing studio room, etc.
Recorded the room reverberation time, recorded by the sort of show room and recording method to determine volume.
Reference value for reverberation time and allowable noise rating of technical rooms

Site	Reverberation time (s)	Noise rating value dB
TV Theatre	1.2	25
600m^2 studio	1.0	25
250m^{2}studio	0.6	25
120m^{2}studio	0.5	25
60m^{2}virtual studio	0.5	25
※200m^2 music recording studio	0.8~1.1	15
※100m^2 music recording studio	0.6~0.8	15
※25m^2 dubbing room	0.3	15
20m^2 News dubbing room	0.3	25
Control room	0.3~0.4	25
Noise rating curve (NR) Refer to related standards for rating control		







Room size and proportion

Studio studio generally smaller, especially language, there are only around 10 m^2 area is small. In such a small room and low-frequency region resonance rate distribution caused by dyeing, so the tape for proportion, width and height must meet certain requirements. The studio of irregular shape can be used in order to prevent the occurrence of acoustic dyeing. The studio shall not adopt any profile to have a square or concave wall, on the top of the dome shape.

recording room type	H	W	L
Small recording room	1	1.25	1.60
Generally recording room	1	1.50	2.50
Low ceiling recording room	1	2.50	3.20
Slim recording room	1	1.25	3.20

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How to decrease effect of standing wave

Definition: Mechanical wave has to be transmitted via elastic medium whose property influences the traveling speed of waves. Different medium causes the reflection and transmission of waves. The standing wave is arose as a result of interference between two waves with the same amplitude but traveling in opposite directions.

Simply, Speed of Sound: 340m/s; Wavelength = Speed of Sound/Frequency

For instance, calculating the wavelength of 200Hz: 340m/200Hz = 1.7 meter. With the help of formula, we are able to know what type and the lowest frequency of standing wave in a certain room.

Some may question, according above formula, only 57Hz can be heard in room with 6meter length? And why the speakers are required to provide sound from 20Hz-40kHz? Yes, if we would like to arise the sound in 20Hz, based on formula: 340m/20Hz=17m, we can know that a room in 17meter length is a must for full 20Hz.

Why 20Hz is highlighted by "full"? It is because frequency of sound wave is composed of positive half wave and negative half wave. Theoretically, a certain frequency can be heard by positive half wave or negative half wave as well. In other words, it can be made in a 8.5 meters long room rather than a 17 meters long. However, in a 17meters long room, the full 20Hz will be lower and softer Which is different with that in the 8.5 meters.

Standing wave elimination sound will be enlarged so that it is louder than other frequencies if the phase of reflecting wave is the same as original one. The louder sound is so called standing wave.

How would the phase of reflecting wave and original wave the same? If distance between two reflecting wall is equal to integer multiple times of half sound wave, standing wave is arose. For an example, wavelength of 100Hz is 3.4meter, half wavelength is 1.7 meters. In this case, 100Hz will be arose if the length or width of a room is equal to integer multiple times of 1.7 meters.

Therefore, standing wave would be arose by according length, width and height in every single room. Unfortunately, if according standing waves based on certain length, width and height gather together, sound of standing waves will be substantially increased. Can standing waves be eliminated? Theoretically, suitable basstrap is able to absorb it. However, there's side effect to absorb other frequencies as basstrap absorb more range of frequencies than only one frequency.

Moreover, a high quality basstrap cost high.
The most economical and the most effective way to solve this problem is to avoid it.
A-1.00:1.14:1.39 B-1.00:1.28:1.54 C-1.00:1.60:2.33

To eliminate or decrease the effect of standing wave, we have to find out the ratio that is affected least from standing waves. It can be available based on above principles. There ratios for your reference
A-1.00:1.14:1.39 B-1.00:1.28:1.54 C-1.00:1.60:2.33

A and B suit more on small rooms, C, bigger ones. These are so called golden ratios for AV rooms. Meanwhile, we have to pay attention to speakers location and hearing seats. With the help of above ways, we are able to find out the area which is affected by standing waves least so that to lower the drawbacks of it.
Will large venues it be limited by the height and divided into smaller rooms? Experiments have shown that the larger the room is, the less will sound be affected. Sound in large space, is not only light and natural, but also is affected by less standing waves. Low frequencies gain a natural downwards as well. In this case, a balance of absorption, diffusion and reflection is supposed to be paid more attention to.

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Listen to the sounds of environmental technology

The relation between Sound system and architectural acoustics.There's a saying--Lower Sound fanciers play instrument, senior fanciers play rooms, which shows how important architectural acoustics it is for making perfect sound. Therefore, strict consideration and correct design on interior sound transmission is the guarantee of excellent sound.

Sound waves will be spread around in a spherical way when sound source makes sound.Intensity of sound decreases inversely proportional to the square of transmission distance(Ref:law of inverse squares).When sound wave travels around, part of sound energy will be absorbed, the other part will be reflected. There are three types of sound that reach audience, direct sound, early acoustic emission which arrives at 50ms later than direct sound(also named most recent emission sound) and Several acoustic emission which reaches over 50ms later than direct sound(also named reverberation sound) Direct sound is the major source of pointing sound source, transmitting sound info, improving clearance and sound pressure level(SPL).Acoustic energy ratio(D/R) between direct sound(including early acoustic emission) and reverberation sound is an important factor that affects sound clearance. Attenuation rate for reverberation acoustic energy is related to sound that materials around can absorb. Usually R60 is represented as reverberation time, meaning the time the room takes to decrease sound pressure level by 60dB(1000 times) when sound source stops making sound. Due to sound absorbing materials is related to sound frequency, sounds become cloudy when R60 is too big, sound turns dull when R60 is too small.

Early acoustic emission can improves sound pressure level and sound clearance to accentuate the feeling of space. Through a designing software EASE, ray tracing method helps to separate early acoustic emission and direct sound though ears cannot do so.

Reverberation sound: Even though it has no either direction or sound info, reverberation makes acoustic field distribute evenly.enriches sound so that helps to distinguish the size of room. If there's excess reverberation, sound clearance will be decreased. At the same time, direct sound would be covered. Echos is formed under over 100ms prolonged reverberation time to seriously reduce sound clearance.



Important factors in acoustic design

Sound absorption coefficient: In architectural acoustic designing, sound absorption materials and sound absorption structure are adopted to eliminate Acoustic defects like echos, flutter echo, sound focusing and to decrease the reverberation time etc. Usually, sound absorption materials and structure can be represented by Sound absorption coefficient.

In formula: Eo-Erα=0 E0. Eo represents sound energy incoming on sound absorption materials; Er represents the sound energy reflected by materials. α=1 means all of the sound energy has been absorbed. When α=0, 100% sound energy has been reflected.

Q-Directivity factor for speaker R- constant of Room(sound that a room can absorb)

α- average sound absorption coefficient of Room S-Square meters of sound absorbing

R60- Reverberation time.

R60 for a room be associated with the volume, surface area and the average sound absorption coefficient. V-volume of a room, M^3 S-Total area for sound absorbing

Thus, the average sound absorption coefficient can be calculated via EYING formula.

M is sound absorption coefficient for air. It is related to frequency and air humidity.

Value of M from 1KHz~8KHz range from 0.003~0.057.

Auditory perception in different reverberation time R60.

R60<0.5 s,(500Hz), clear but too dull, suitable for recording studio.

R60=0.7~0.8s,(500Hz), clear and pure, suitable for cinema and conference room.

R60=1.2~1.4s(500Hz), rich, powerful and strong feeling of space, suitable for concert hall and theater.

R60>2s-3s(500Hz), sound is cloudy, difficult to be distinguished, buzzing with echo.

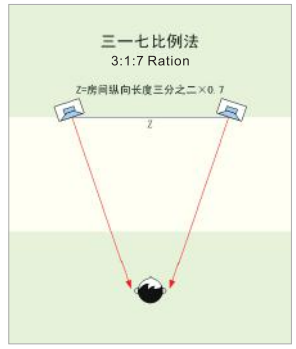
Apart from sound absorption, improving architectural acoustic characteristic can be achieved by placing sound wave diffusors to reflect resonant frequency indoors. MLS (1-3-2-1-1-2-1 random number)and QRD (hn=<入0/2N >'Sn) of Soundbox is able to solve the problem of sound distortion and flutter echo.

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HIFI stereo set a reference model

3:1:7 Ration

Ways of placing; Separate the dough into three equal sections THREE); Speakers are to be placed on the one third of the room.(ONE)Distance between the two speakers should be the 0.7 times the length of second-third of the room. SEVEN) It's better that speakers project inside the room to a certain degree(not a must).Audience position is not supposed to be near the back wall.
Effect: This way fits large space with an even ratio like 1:1.25:1.6 or 1:1.6:2.5 in order to gain acoustic field with balanced sound in width and depth.



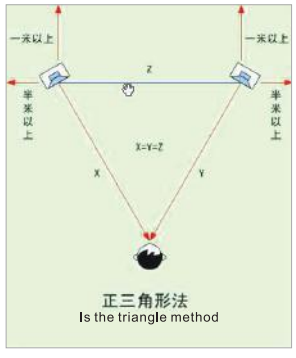
The 331 proportion method

Pendulum method: (3) the length of the room are divided into three divisions, width are also divided into three thirds (3), the speakers on the length and the width of the first uniform node (a).Speakers can have slightly inward projection Angle, don't even need to inward projection can also, listening position cannot be put on the back wall.
Results: this method is also used for larger size and proportion of homogeneous space.Percentage of it with the "317" spirit is consistent, and the percentage of "317" different is only a narrow interval between the two speakers.This method can also be balanced voice sound field with wide and deep.



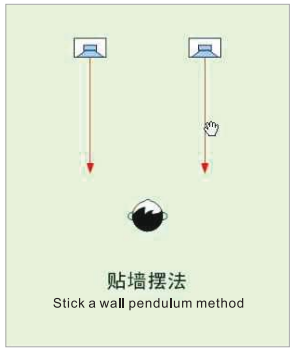
Is the triangle method

Pendulum method: first condition is the speaker to leave the back wall (at least 1 meter above) and side wall (at least 0.5 meters above).The second condition is as the position of the two speakers to listen to a regular triangle.The third condition is the second speaker inward projection Angle is 45 degrees or more.This is the fourth condition is a triangle but can small.The room is small, after class when power is not a square is smaller;When room is big, after the power is triangle can enlarge.
Effect: this is commonly known as the near sound field method.It can reduce the four walls are the benefits of sounds to speakers directly reflect the excessive interference, thus to obtain the very good position depth and width of the sound field.This is to be able to hear most, the most direct, the most clear details of the method.Many commentators in the evaluation of sound when using this method.



Stick a wall pendulum method

Pendulum method: it is the oldest of the pendulum method.Turn the speakers close to the back wall, whether it's 50 cm from the back wall or 30, 20 cm it doesn't matter, to allocate.Often speakers don't need the projection Angle inward.
Effect: the use of high frequency, intermediate frequency and low frequency weak sharp, can let the intermediate frequency and low frequency full rise, the high, medium and low frequency can be balanced.However, it also makes the sound field of the depth becomes shallow, narrow width. However, if with sharp bad voice two phase balance, at the expense of sound field to calculate the performance of voice is right.



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Factors of Small AV Room Acoustics

Rt60 is supposed to be between 0.4-0.8 seconds -- too short, sound would be too dry Too long, sound would be not clear and annoying.

Good diffusion -- Direct sound and reflected sound diffuse evenly.

No sound focusing -- There's no big curve surface to focus the sound.

No room resonance -- Suitable room size in length, width and height to avoid standing wave.

No object resonance -- There's no resonance among objects inside this room to avoid sound pollution.

1. Room Size
A 1.00:1.14:1.39 B 1.00:1.28:1.54 C 1.00:1.60:2.33
Both A and B suit small room, while C suits the larger ones. These are so called Golden Ratio for Audio Room.
Some would put forward following questions like -- What if I have a very big room? Shall I reduce the size of my room based on above Golden Ratio? As far as I know, the bigger the room, the less that sound would be twisted by walls. In this way, sound will be more natural instead, though low impact of standing wave and natural downward extension of low frequency should be controlled. Therefore, regarding big sized rooms, adjusting for balanced absorption and diffusion is a must.

2. Basic Structure
Density of basic materials and thickness of structure are the keys for low frequencies to their highest function. Notes for structure and materials.
1. Wall material: -- The first choice for walls is brick solid wall, second lightweight brick. Gypsum boards or plywood boards are not supposed to be choices for walls.
2. False ceiling -- It is supposed to be solid. Distance between frames should be ≤300mm. Plywood boards ≥18mm + ≥12mm calcium silicate boards or gypsum boards
3. Floor -- Adopting carpet or solid wood floor is better It is not recommended to apply solid wood floor with back cavity which forms low frequency resonant cavity.
4. It is not recommended that to apply extensive cabinet, especially the front wall for main speaker. Such cabinets would destroy sound balance because of forming into the uncontrollable basstraps.

3. Misunderstanding of Acoustics
1. Importance of ceiling first reflection on AV acoustic environment.
Most ceiling of AV rooms are installed sound absorption materials, like fabric panel, glass fiber panels, and decorated stars etc, which neglects the importance of first reflection from ceiling on AV acoustic environment. If the sound 0-90degree upward based on speakers reflected firstly by ceiling was absorbed, the 3D acoustic image would be destroyed so that sound would lack of sense of space. Ceiling reflection plays an important role in medium and high frequency reflection for HIFI and karaoke. Even 360 surrounded cinema speakers rely much on ceiling reflection to achieve sound image on top.
2. The principle of sound diffusion is similar to the one of optical diffusion, being effected by surface receiving and reflecting. Based on reflection principle, sound diffuser is supposed to be placed on the surface of certain reflecting point. Usually at the 1st and 2nd reflecting point. Sound diffuser should be on the surface that receives sound to release the sound energy after diffusion. If being covered or sealed up which is a mistake that small interior design would most likely makes, diffuser will fail to effect.
3. Quite a few AV rooms just copy commercial cinema acoustic design without second thoughts, ignoring the acoustic characters of commercial cinema is to play films only and long reverberation time in big space. A private theater usually has to meet multiple demands like music hearing, Kara OK, games playing and studio recording except playing movies. The natural RT60 for small spaces is shorter than commercial cinemas which is always in big volume. Consequences of 100% sound absorption acoustic design leads to unbalanced acoustic environment with too much pressure and dryness that fail to meet requirements for music hearing, Kara OK, games playing and studio recording, even destroy a comfortable space for movies watching.
4. The abuse of sound absorbing materials doesn't help in sound effect but would destroys the acoustic environment instead. The application of acoustic materials has to be based on strict and careful calculation, knowing clearly about the frequencies excess or lost and reflection to be absorbed or reserved. Even the reason causes standing waves in certain frequencies has to be known by designers so that they are solved by correct solutions. Absorption, diffusion and reflection are approaches for acoustic treatment. Dealing with reflection from basic walls correctly is one of professional techniques for acoustics designers. It is likely that pasting sound absorbing materials without serious calculation leads to disruption of acoustic fields which is balanced before.

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5.1 surround sound system has five speakers, left, right, front, right and left around around, there is also a heavy bass speakers.

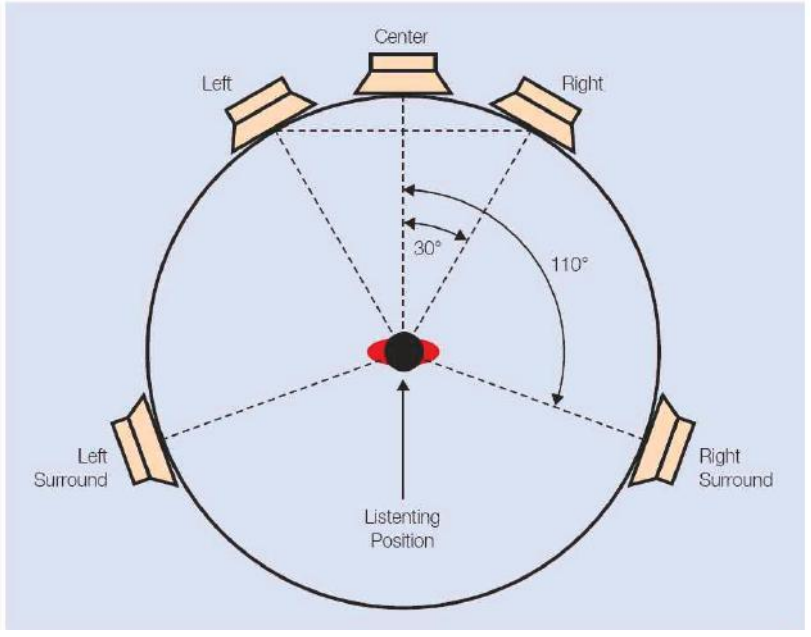
5.1 surround sound system, put the position is the same as 7.1 surround sound system is reduced after the left and right rear speaker placement.

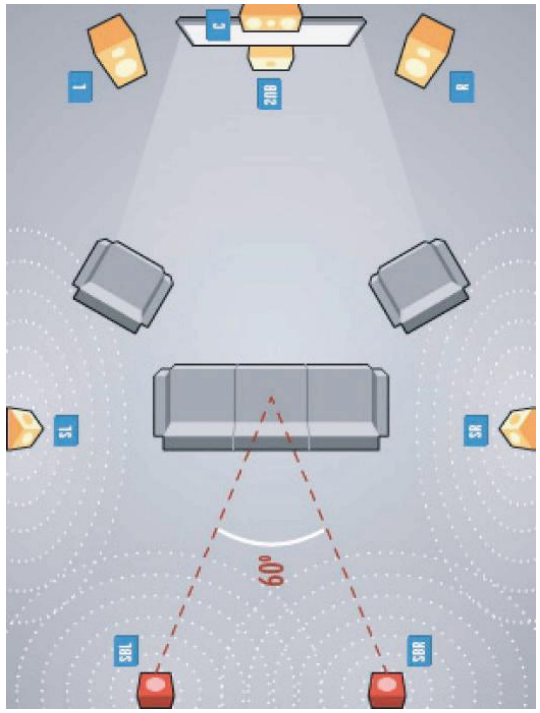
Left and right in front of the speaker (L and R) in order to obtain broad sound field and improve the effect of sound to locate, speaker and the audience put 45 °.

In the rear speakers (C) placed either above or below the screen. If you are using the speakers are placed in and around to the height of front speakers on the same parallel lines.

The rear speakers (SL and SR) position and the audience into the location of the 90 °, 110 °, to get more intense surround sound field.

Heavy bass speaker (SUB) location is simpler, need to be placed in the middle of the auditorium front wall. A subwoofer is placed in the center of each wall. If you have two subwoofers, placed in the center of the opposite of two sides wall. If there is only one subwoofer, placed in the middle of the auditorium front wall.





7.1 surround sound system has seven speakers, left, right, front, left around, around, left and right rear after satellite speakers, right at the same time there is a heavy bass speaker.

Left and right in front of the speaker (L and R) and the position of the audience put 45 °, can provide broad sound field and raised his voice to positioning effect.

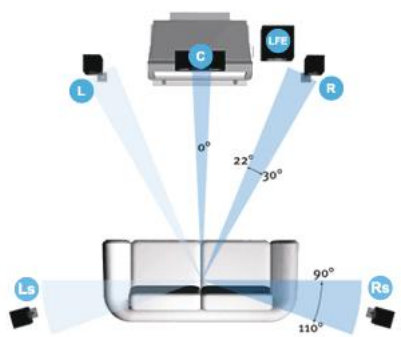
In the rear speakers (C) placed either above or below the screen. If you are using the speakers are placed in and around to the height of front speakers on the same parallel lines.

Surround sound left and right speakers (SL and SR) position and the audience into the location of the 90 °~110 °, to get more intense surround sound field.

Rear surround speakers (SBL and the SBR) and placed in the audience were behind the party, to achieve maximum sound field effect, such as the SBL and the SBR can't placed together, you need to adjust the Settings menu.

Heavy bass speaker (SUB) put the position is associated with the number of the subwoofer, if there are four subwoofer is placed in the center of each wall. If you have two subwoofers, placed in the center of the opposite of two sides wall. If there is only one subwoofer, placed in the middle of the auditorium front wall.

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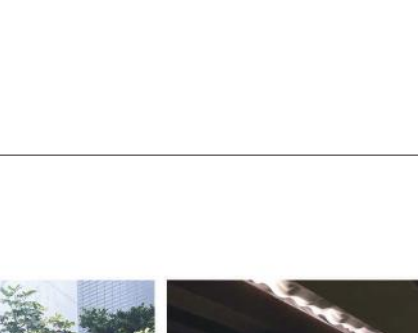








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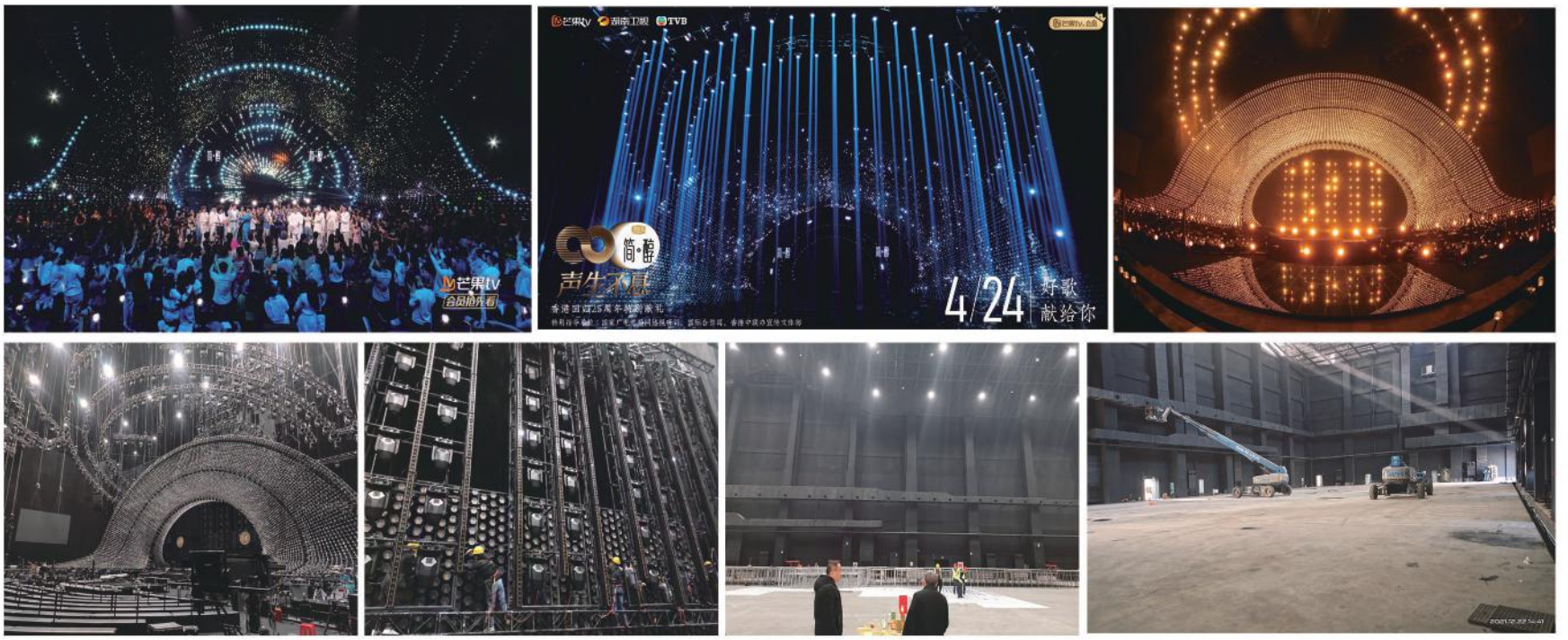
Starbucks



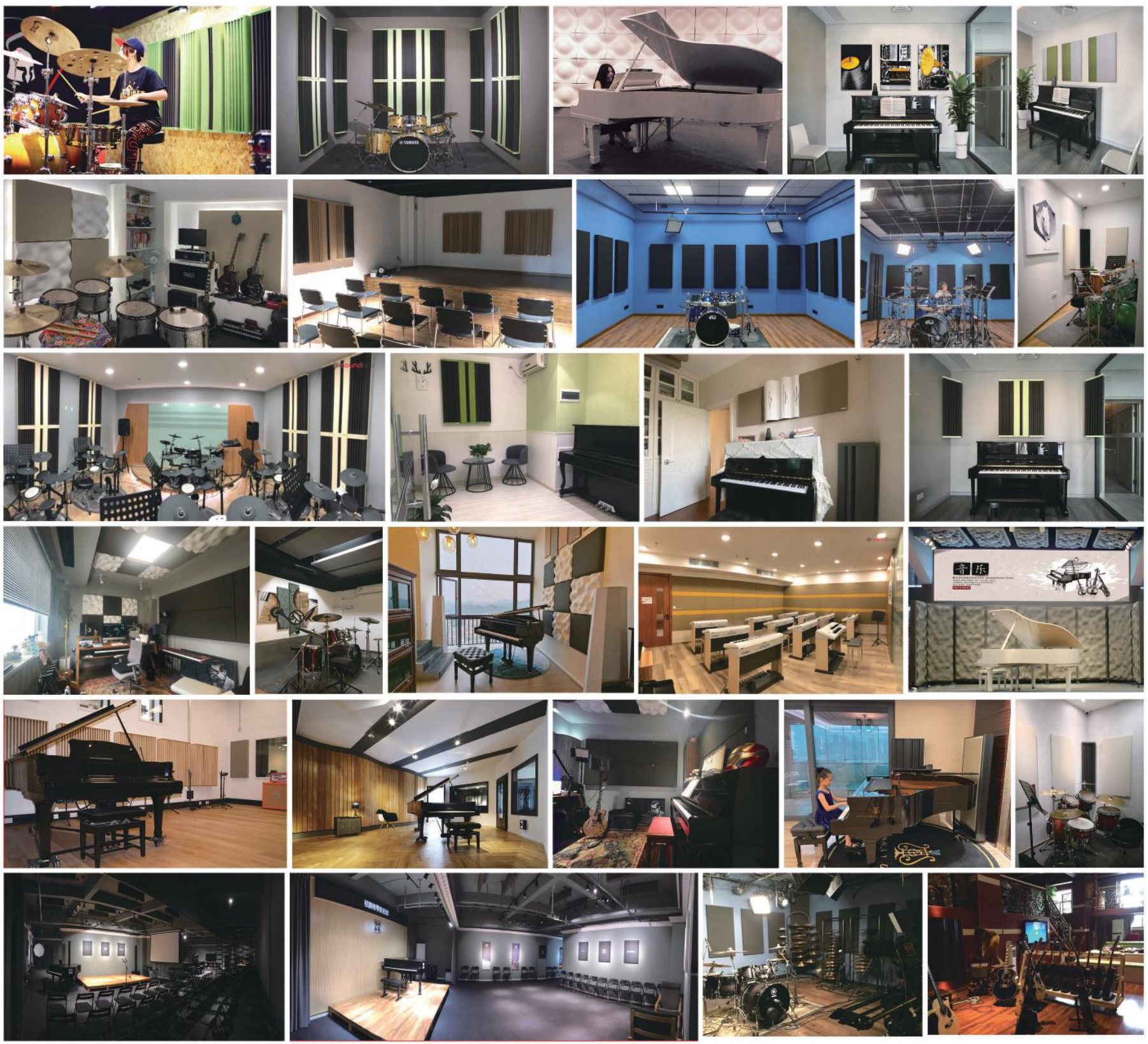
Mercedes-Benz

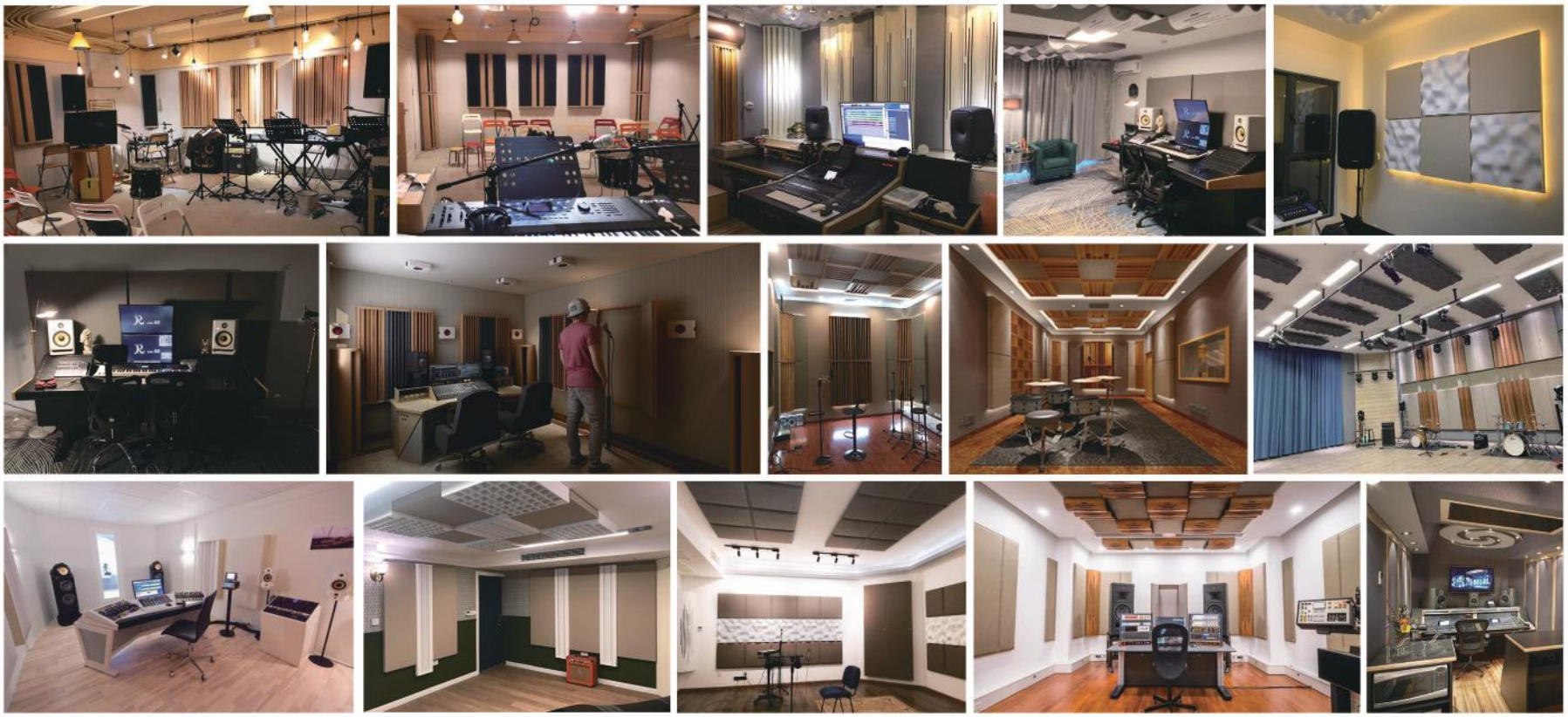


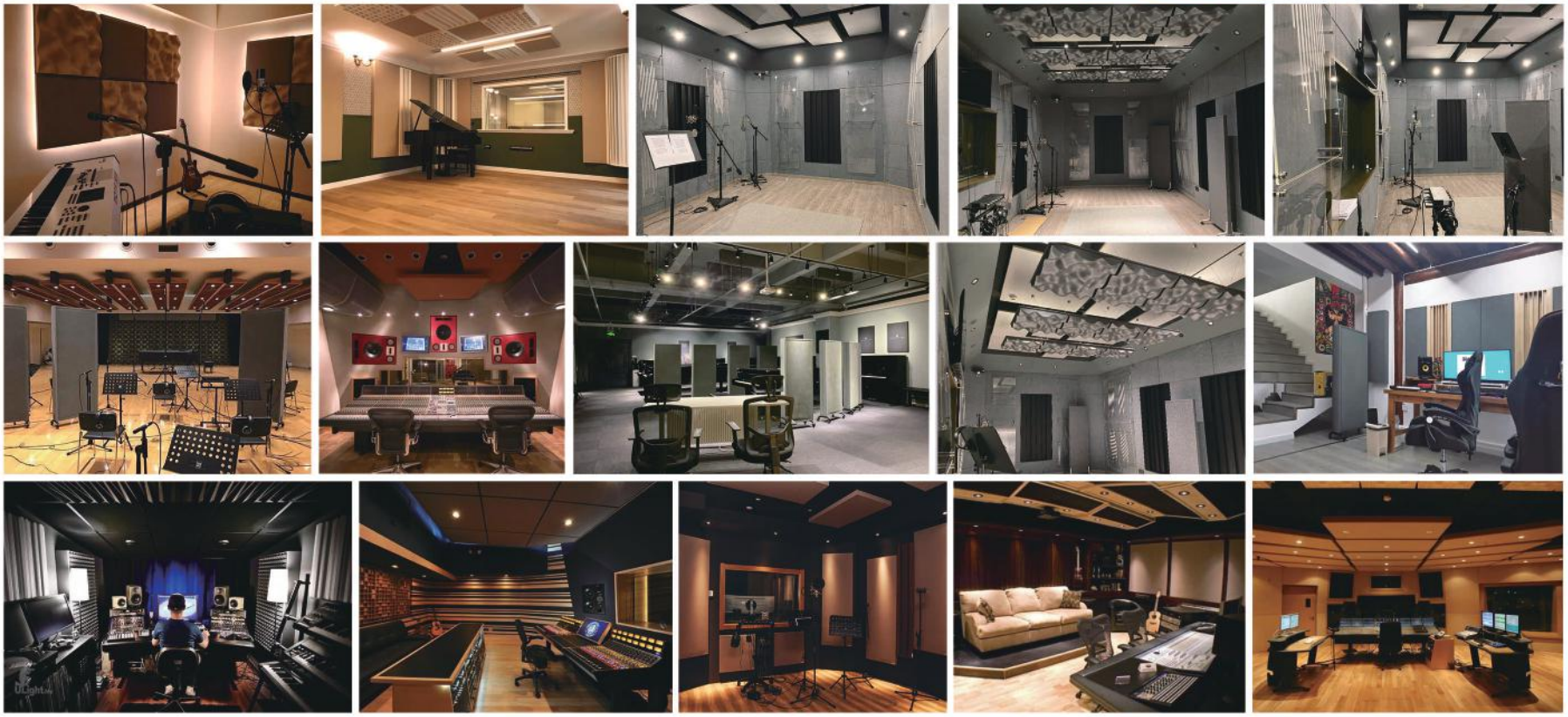
Guangdong Radio and Television station

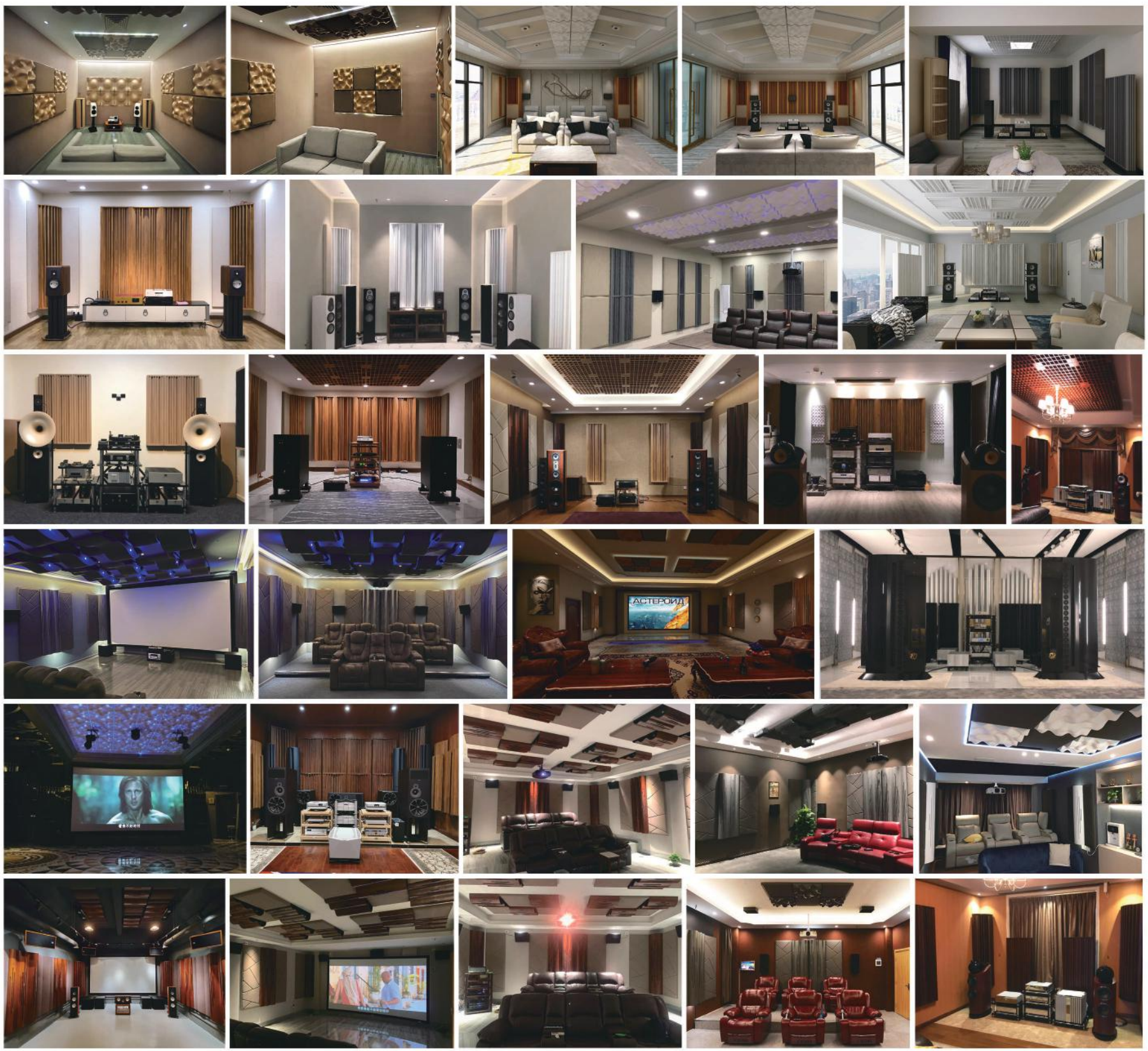


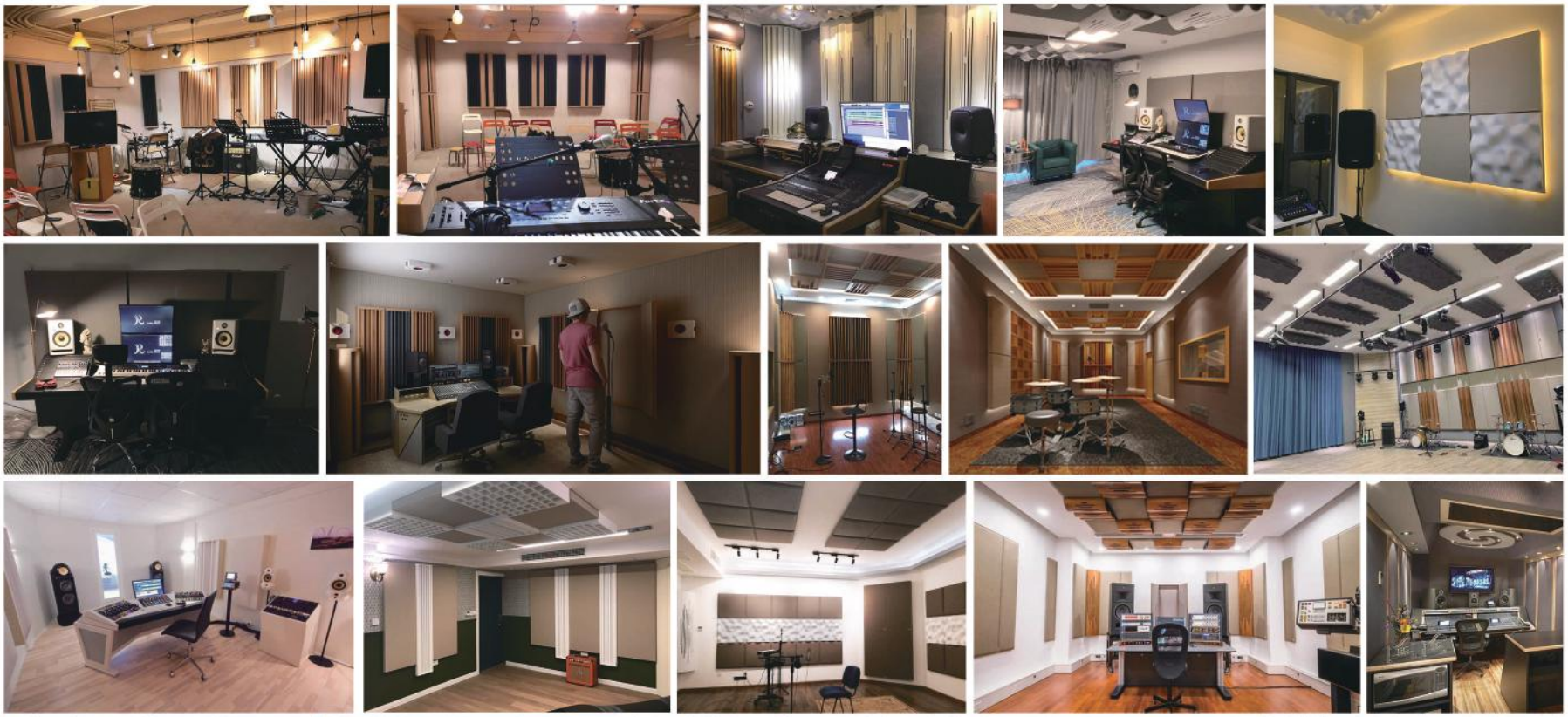
Hunan TV

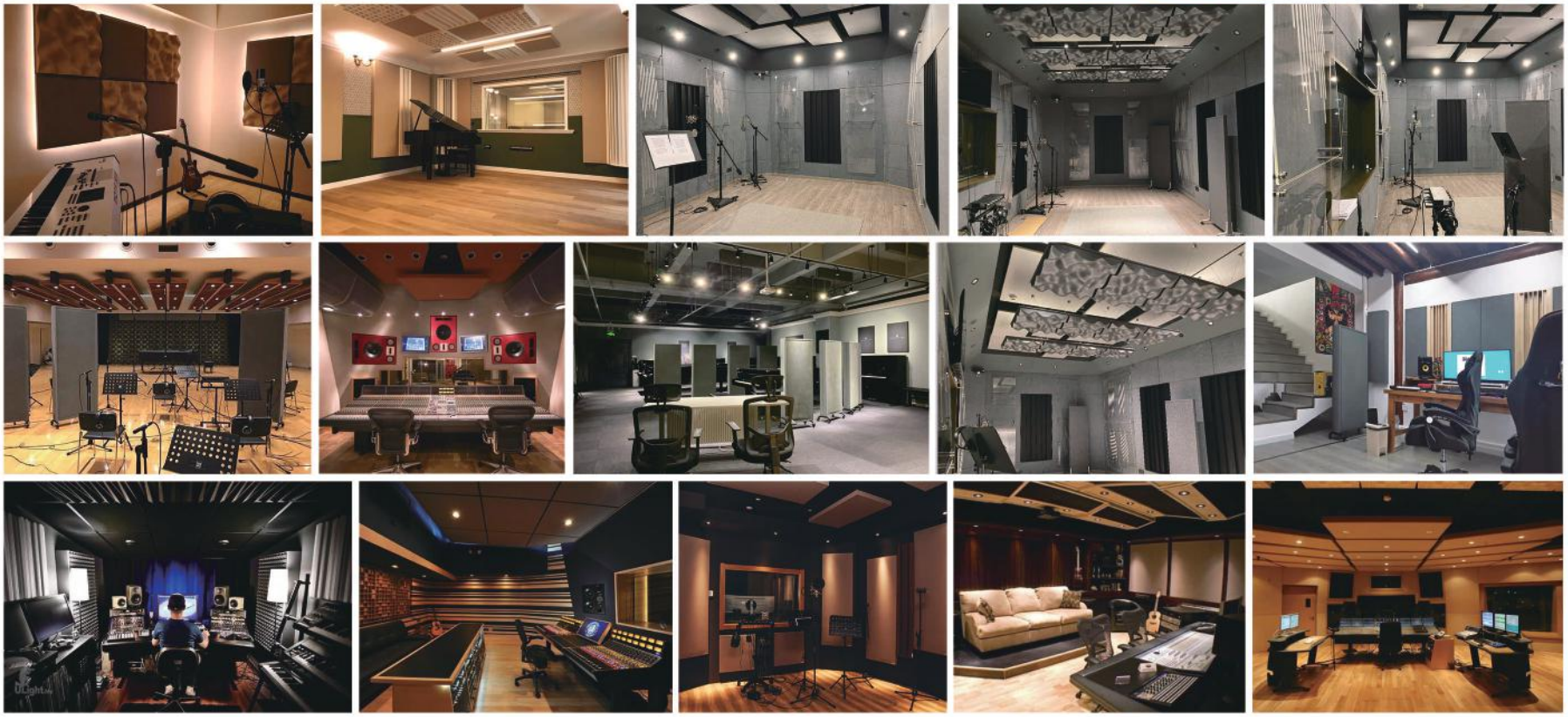


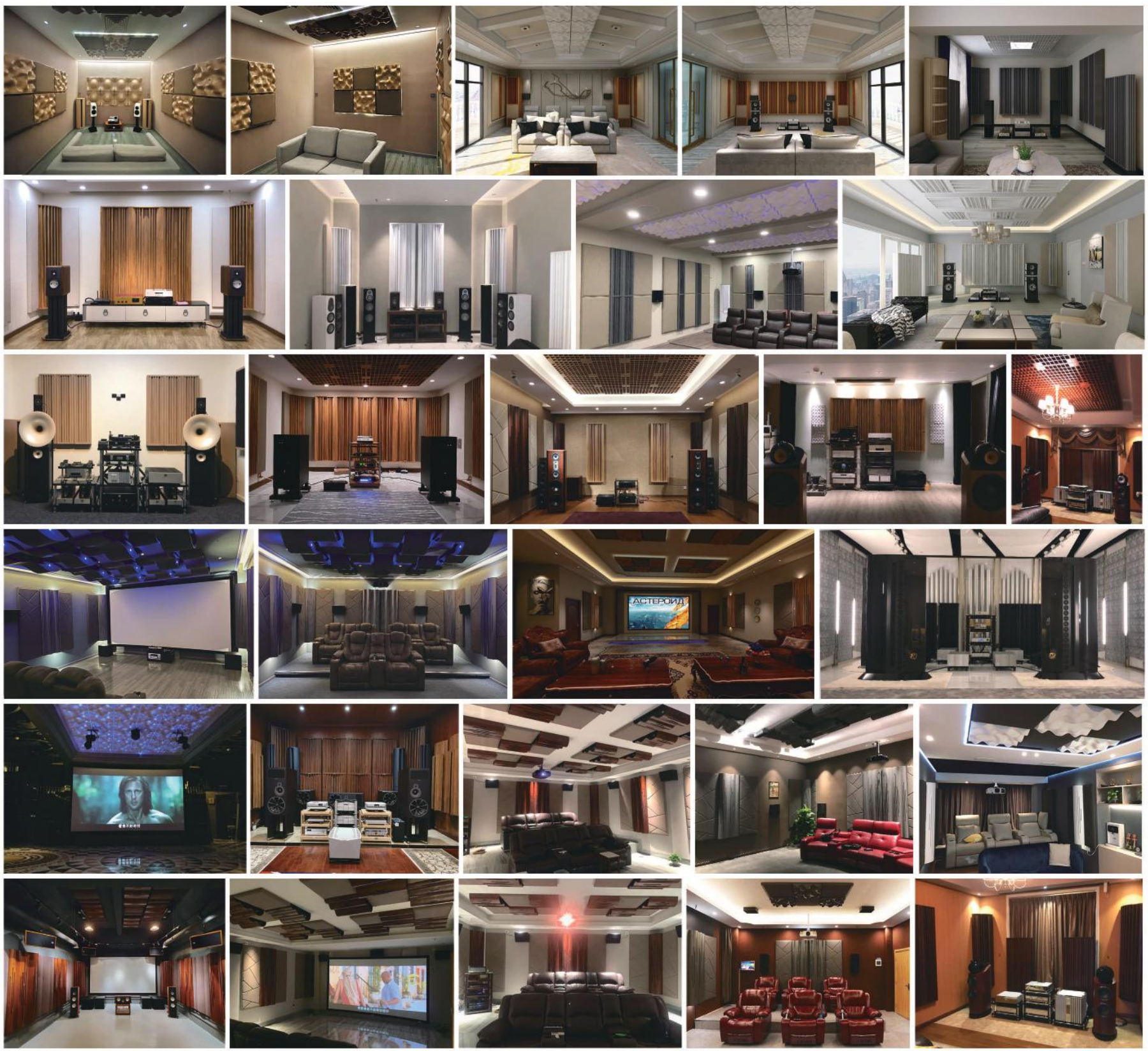


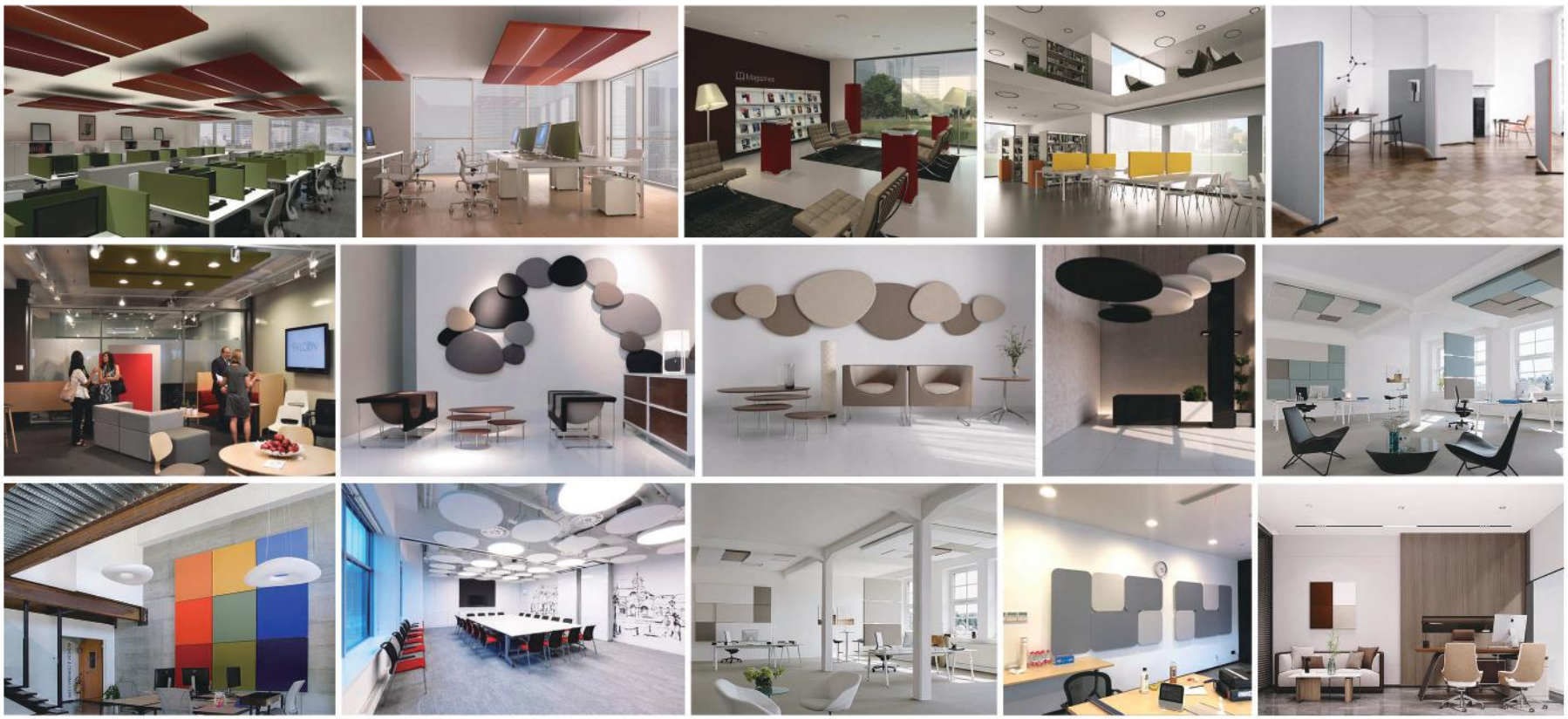



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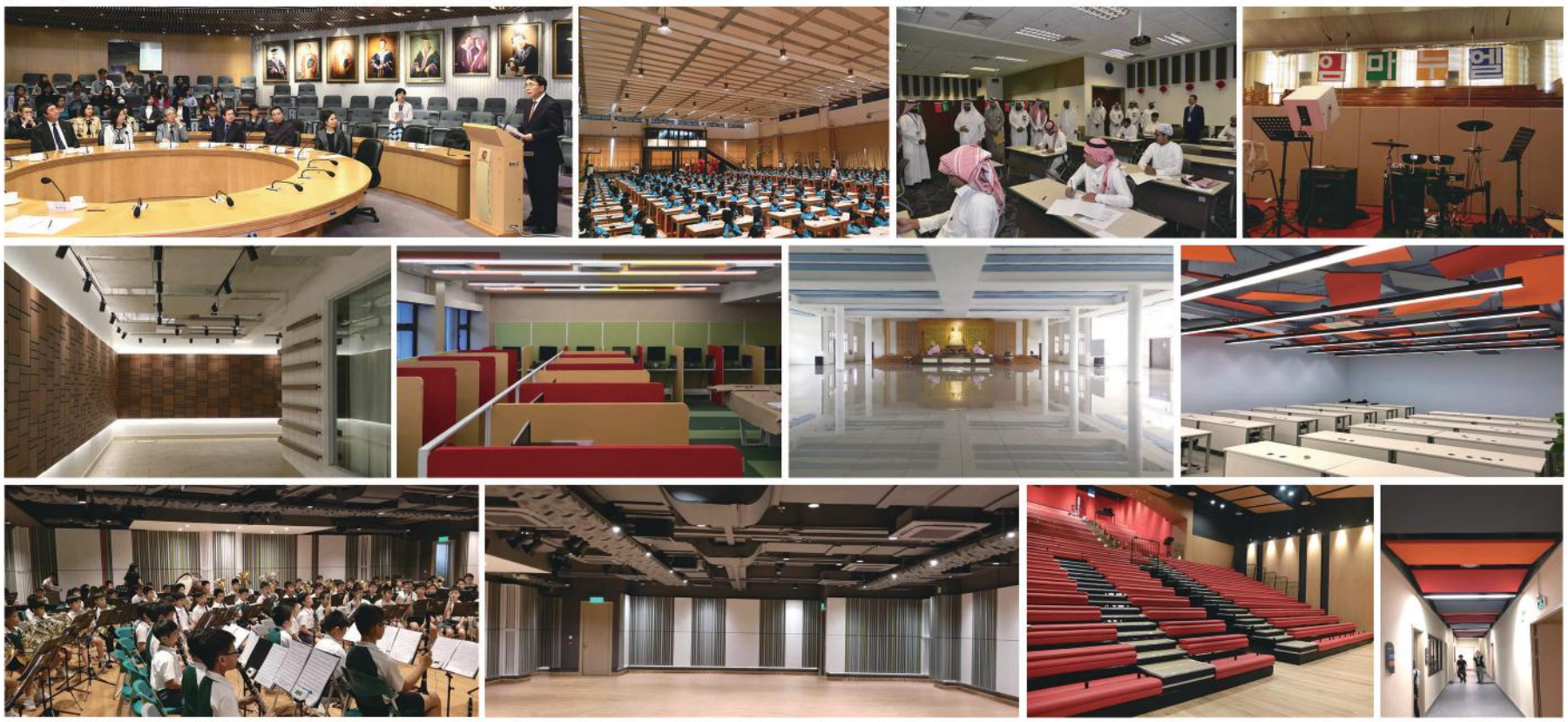


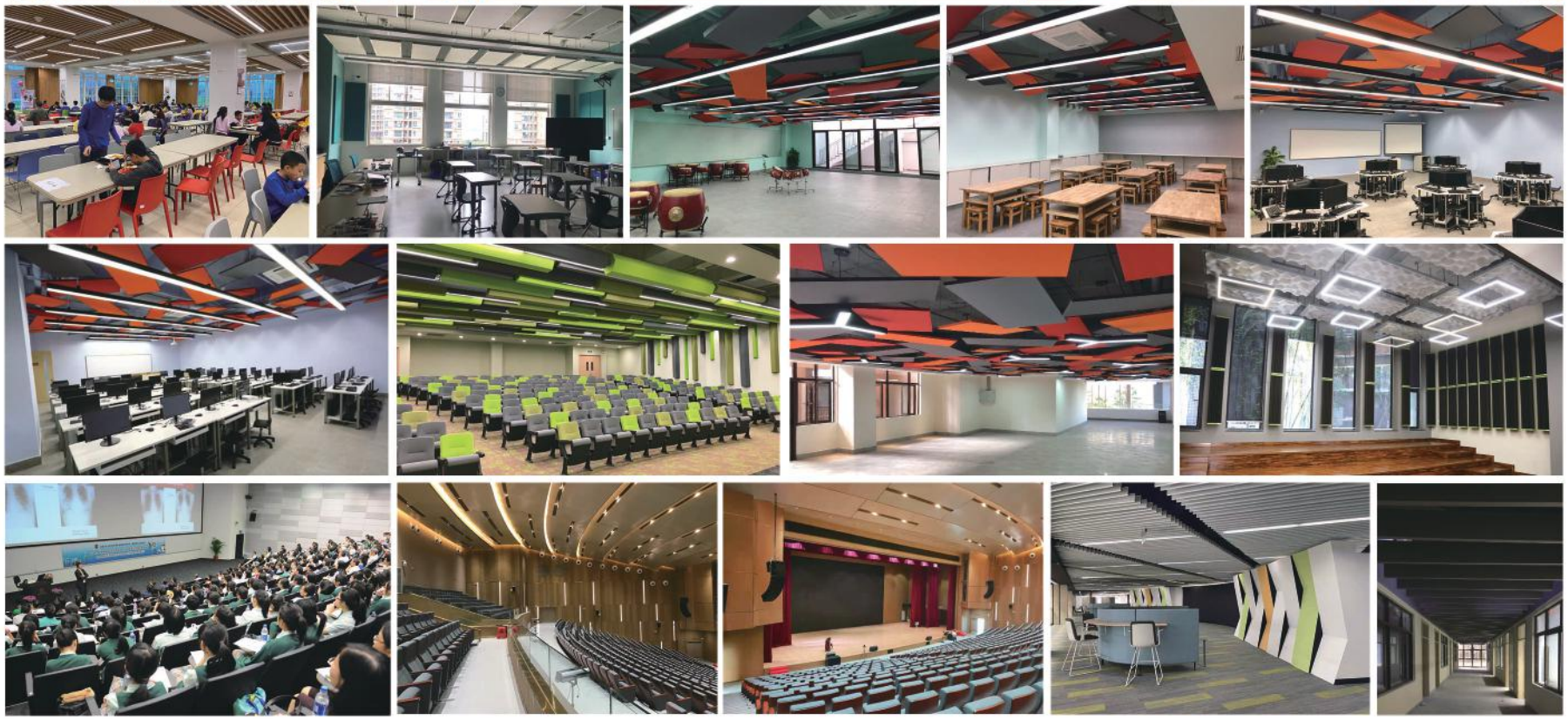



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COMMITED TO SUSTAINABILITY

Sustainability is an important consideration in the manufacturing of the Acoustic Panels. Wherever possible, recyclable and environmentally r materials are incorporated into the production process, including plastics, cotton, engineered wood and glass fiber reinforced materials.

Recyclable components may also include wood sourced from self sustaining forests, fabrics, ceramics and chipboard. Finishing processes use ecological paints formulated with environmentally conscious dyes and components, without active solvents.

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