THE ART & SCIENCE OF
Room Acoustics
ABOUT THIS BROCHURE

What you will find in these pages is a descriptive gallery of the most complete line of Room Acoustics products offered by a single source. All of these products are used to control the sound quality of your space from an office conference room to a sports arena; Kinetics has the products that look as good as your space will sound.

QUICK REFERENCE GUIDE

ABSORBERS

An absorber is the most basic and widely used sound quality finish treatment. These products reduce reverberation and noise by absorbing sound. Performance is engineered by product type, location and the amount of absorbing material in your space. Absorbers are used in any reverberant space from corridors to expansive arenas.

DIFFUSERS

Diffusers are used in music and other critical listening spaces to improve sound quality. Diffuser panels maintain reflected sound energy while controlling undesirable specular reflections. The result, sound is scattered evenly throughout the listening space.

REFLECTORS

Reflectors are used to optimize the strength and timing of reflected sound to all audience locations. World famous pavilions achieve this with complex shaping of walls and ceilings. Properly located, designers can use acoustical reflectors to achieve similar results at much lower costs.

ABSORBER / BLOCKER

Sound engineered ceiling panels are used for privacy between rooms and sound control. Lay-in ceilings using these specialty tiles provide both high CAC ratings to block sound while maintaining the NRC Rating for sound absorption.

Please find complete information on each product include test data, LEED information and specifications at www.kineticsnoise.com/interiors/.
THE WORLD OF ROOM ACOUSTICS

What is Room Acoustics? The size, shape, and finish materials that define a room will control the sound quality or “room acoustics”, good or bad. Examples of poor sound quality are common in a large variety of spaces, and point to the need for addressing acoustics during design. Have you experienced a restaurant where dinner conversation is nearly impossible because of reverberant noise? Have you heard a public address announcement in a gymnasium or at the airport where the words were unclear? Have you been in a hospital patient room where you can easily hear speech and footfall noise from the corridors? Proper application of the right acoustical materials solves many of these problems.

Reverberation Control and Sound Absorption
Excess room reverberation is a major source of complaints. Designed properly, absorptive panels can reduce the reverberant noise level of a space by as much as 40-50% (8-10 decibels). Reducing reverberation will improve not only the background noise level but will improve speech and music clarity. This stated, it is possible to over absorb and make a space sound too “dead”. What is required is the proper amount of absorption for the space in which it is being used. An easy way to analyze a room is to calculate its’ T60 reverb time during the design phase. This is merely the amount of time it takes (in seconds) for sound to decay 60 dB. Here is a partial list of optimal T60 times:

<table>
<thead>
<tr>
<th>Room Type</th>
<th>T60 (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classrooms</td>
<td>0.6-0.7</td>
</tr>
<tr>
<td>Band Rooms</td>
<td>0.9-1.1</td>
</tr>
<tr>
<td>Movie Theaters</td>
<td>0.9-1.2</td>
</tr>
<tr>
<td>Choral Rooms</td>
<td>1.2-1.6</td>
</tr>
<tr>
<td>Multipurpose rooms</td>
<td>1.6-1.8</td>
</tr>
<tr>
<td>Concert Halls</td>
<td>1.7-2.2</td>
</tr>
</tbody>
</table>

The amount of reverberation required for an effective classroom environment is much less than for a concert hall. This is because you want the teacher to be heard very clearly with minimal effort. In a concert hall the acoustic field should be rich and full, enveloping the listener in both direct and reflected (reverberant) sound.

Reflection/Diffusion
Another goal in Room Acoustics is to control sound reflections so that all listeners enjoy optimal sound quality. Controlling these sonic bounces, both in timing and direction, is an important part of the design for critical listening spaces, from recording studios to performance halls.

Reflectors that are shaped to disburse sound evenly across a broader area are called acoustic diffusers. Diffuser panels are engineered to be effective for selected frequency ranges. Properly located on walls or ceilings, sound quality can be optimized at all listener seat locations.
Add our AcoustiGraphix option to any fabric faced panel for school spirit, company pride, or simply artistic flair.

Absorptive panels and diffusers create a band room that has the desired reverberation level and a consistent high quality sound field throughout.

Panels can be custom cut to a variety of shapes.
DESIGN TIP:
Use a custom mitered edge to create a dramatic reveal between abutting panels. Here two beveled edges produce a masonry block appearance.

DESIGN TIP:
Use High-Impact HardSide panels to reduce reverberant noise and improve speech intelligibility. Locate above 10 ft. in typical gymnasiums. For greater impact resistance, consider Sportsboard.
FABRIC WRAPPED SOUND ABSORPTION PANELS

Larger Spaces = Increased Reverberation

DESIGN TIP: Reverberation Time (T60) is directly proportional to room volume. Absorber panels can be added to walls and ceilings to meet an acoustic goal.

DESIGN TIP: Hundreds of fabrics work well as acoustical facings. Some do not. Consult with your panel manufacturer on best fabrics.
HardSide PANEL

This basic wall panel absorber can be located anywhere reverberation and noise are a problem and fabric or vinyl finishes are desirable.

High Impact HardSide PANEL

Adding a high density fiberglass outer layer to our standard HardSide allows this panel to handle medium impacts such as errant basketballs or an occasional elbow. The extra layer also matches the thickness of our sound engineered TAD and Versa Tune panels allowing these products to be blended in a room where “room tuning” is required.

SportsBoard Elite PANEL

Baseballs or other extreme impacts are withstood without damage thanks to a tough, perforated, co-polymer substrate covered by a fabric or vinyl facing.

Hi-Tack PANEL

This non-acoustical panel captures the same look as our other fabric wrapped panels while providing a highly tackable bulletin board surface for offices, community centers, and classrooms.

Mix and match identically wrapped panels for different functions. Tack boards and absorptive panels look and sound great together.
Common acoustical wall panels are most effective absorbing mid and higher frequencies, while absorbing much less in the lower, bass range. Application of only standard acoustical panels can create a room that is too “boomy” with excess low frequency reverberation. Adding too many standard panels to control the low end can create a room that is too “dead” in the high end.

The VersaTune’s engineered composite core absorbs lower frequency acoustic energy more effectively than traditional panels. This is done without adding thickness or excess cost. VersaTune improves the listening quality in the space by reducing excessive bass reverberation. The unique multi-density panel core boosts the absorption coefficient in the 100 to 400 Hz 1/3 octave bands to an average 0.79, much higher than standard 2-1/8 inch thick acoustical panels.
Our Tuned Absorber/Diffuser Panel combines engineered acoustics and a choice of fabric coverings or exposed natural wood (TAD Revealed). TAD Panels an excellent design solution where more mid-frequency sound absorption and high frequency diffusion are desirable.

The outstanding acoustical performance of this panel is the result of the assembly of a sound absorptive fibrous core covered with a variable impedance laminate. Openings in the laminate are sized and spaced to optimize the absorption in low to mid frequencies while creating random higher frequency reflective surfaces between openings (variable impedance). For increased low frequency sound absorption, a thicker fibrous core (2 to 4 inches) can be specified. For increased high frequency absorption, the hole size can be changed to 5/8 inch diameter versus the standard 1/2 inch opening.

Often used with HardSide High Impact panels, this product perfectly balances the sound field by aiding in mid and low frequency absorption while scattering and reflecting high-mids and higher frequencies.
HealthGuard Acoustical Panel

Through Medicare funding, new healthcare law financially rewards hospitals that offer a quiet environment to heal while withholding funds from facilities that do not. Hospital administrators are taking notice. The following areas can be quieted by applying sound absorptive material close to the noise source:

- Nursing Stations
- Corridors and Stairwells
- Reception Areas
- Patient Rooms

Acoustical panels can reduce reverberant noise by as much as 5-10 dB in the space they occupy and this noise reduction can contribute greatly to patient comfort and privacy. That stated, traditional fabric wrapped panels have not been widely accepted because of the following challenges:

- Surfaces must accept strong cleaning and disinfecting solutions
- Surfaces cannot promote the growth of bacteria or viruses, and ideally should inhibit growth
- Surfaces must withstand abuse from people and equipment

Enter Kinetics Healthguard Panel. The core was developed with a lower profile (5/8” or 7/8”) and greater impact resistance (8 pcf density) that works well in active, congested spaces. The designer can select from a variety of specialty acoustical fabrics that can be scrubbed with a bleach solution. Finally, the fabric is treated with a permanent antimicrobial coating that can stand up to bleach cleaning. The result is an acoustical panel that stands up to the rigors of a hospital environment, guards against microbial growth, and quiets the area to let patients focus on healing, not noise.
HIGH ABUSE RESISTANT ACOUSTICAL PANELS

**KNP Perforated Metal PANEL**

A perforated steel or aluminum shell with powder coat finish encases an absorptive core for a rugged, clean appearance. The surface can be flat or ridged. Select powder coated galvanized steel for most locations or aluminum for potentially corrosive environments (chlorine around swimming pools). Perfect for use in gymnasiums, natatoriums or multi-purpose rooms.

**SportsBoard Conform PANEL**

A protective co-polymer finished shell is used to cover the edges and face of the panel. The result is a perforated co-polymer panel available in a wide variety of colors that can stand up to the hardest impacts. The perforated co-polymer cleans easily with a sponge and isopropyl alcohol.
SOUND ABSORPTIVE WOOD FINISHES

Alto PLANK  Sereno PANEL  Ensemble PANEL

Control your reverberant space and add the warmth and beauty of a wood surface. With performance rivaling the common fabric wrapped acoustical panel, designers can now opt for an attractive custom wood finish. Sereno panels and Alto planks are field installed to nailers over sound absorptive fiberglass. If an all-in-one solution is desired, the Ensemble panel comes complete with the fiberglass installed; simply hang these custom sized panels on z-clips to make your room look as good as it sounds. All of our wood absorbers are available in a wide variety of finished veneers.
Searching for a ceiling tile product that improves speech privacy and reduces noise intrusion through a lay-in ceiling? Does your design require matching existing lay-in tiles? Need noise control for the area above, but require access to equipment in the plenum space?

Kinetics’ QuietTile uses additional mass and sound damping to produce a composite ceiling tile designed to reduce sound transmission through a lay-in ceiling.

Achieve sound control and speech privacy in a lay-in ceiling system where conventional ceiling tiles fail.

**Description**
- Composite ceiling tile designed for improved sound transmission loss.
- Available in nominal 2 ft. x 2 ft., 2 ft. x 4 ft. or custom sizes

**Composition**
- Gypsum board
- Viscoelastic sound damping layer
- Ceiling tile face - can be provided to match existing ceiling tile
BAFFLES & CLOUD PANELS

Suspending acoustical materials away from the ceiling surface improves absorption so that less material is used to achieve acoustic goals. Both horizontal and vertical orientation of baffles and clouds with all surfaces exposed to sound (air) movement is highly effective boosting low and mid frequency absorption 20-40%.

**Wave BAFFLES**
Create a stunning visual effect while controlling reverberation and noise, while staying on budget.

**KB803 BAFFLES**
These vertically hanging baffles are as inexpensive as they are effective.

**HardSide CLOUD**
Turn our basic HardSide panel into a suspended horizontal cloud and create a stunning and highly effective architectural feature.
When the Cincinnati Bearcats basketball team required a quieter work space, their practice gym, Kinetics supplied products that reduced reverberant noise while proudly displaying their brand. Working with our local representative, the University of Cincinnati Design and Construction Department chose Acousti-Graphix panels and Wave Baffles to create an atmosphere where the players can clearly understand instruction. The Lindner Athletic Complex is now an attractive recruiting aid and a great practice facility.
Diffusers are used to control undesirable flat wall or ceiling sound reflections that create poor sound quality depending on the location of the listener. Properly used diffusers maintain the energy of sound reflections while spreading the sound more evenly across the listening space.

HighTones and MidTones solid wood Diffusers are designed using a repeatable sequence of 7 elevations based on quadratic residue diffusion theory. What that means to designers is the performance of these panels is predictable within an effective frequency range. These beautiful panels scatter sound reflections more evenly across a single plane (1D diffusion) optimizing sound quality.

HighTones controls primarily high-middle to high frequencies (2,500 Hz to 12,500 Hz) for higher pitched instruments like the flute, piccolo and cymbals. The larger well MidTones panels diffuse sound in the midrange frequencies (500 Hz to 2000 Hz) for instruments such as the French horn, saxophone, and violin.

The ScatterBox diffuser panel is a hardwood gridwork designed as a “2D diffuser,” scattering sound evenly across two planes. Popular in recording studios the ScatterBox is the design of Russ Berger and the Part Science Group.
Geometric Sound DIFFUSERS

Improve room acoustics through random disbursement of sound reflections throughout the listening space. Sound diffusive surfaces create a clearer and more consistent listening environment for music educators, performers, and the audience by redirecting and scattering sound waves reflecting off walls and ceilings. Ideal for instrumental and choral rehearsal spaces and auditoriums. Apply these white co-polymer diffusers as they are or wrap them with your choice of fabrics.
World class concert hall designers will add complex shaping to the walls and ceiling with the goal of directing sound to the audience at the right time and right level. The result is a dramatic, enveloping sound field that immerses the listener while eliminating distracting “late” reflections. It is also expensive to build. Ovation reflector panels allow designers to add acoustical shaping and timing features to a more typical room shape in order to achieve similar results at a much lower cost.

The finished look is as dramatic as the sound field that is created. The desirable reverberation characteristics of the space are preserved, while improving the timing and strength of reflected sound from the ceiling to the audience. A retractable version can be used over the auditorium stage, lowered when needed, and stored in the stagehouse when not in use. Ovation reflectors are also used to add shape to walls and provide sound diffusion.
When New Jersey’s Wilbur Watts Intermediate School was being replaced, a local referendum funded a 500 seat auditorium. As the auditorium would be available to both students and the community at-large, extra attention was dedicated to acoustics. The acoustical consultant focused on the three areas of concern in an auditorium—ensuring the stage sounds would reflect evenly from the ceiling, envelope the audience by diffusing sounds from the side walls and adding absorption to maintain a proper level of reverberation. These goals were beautifully accomplished by suspending Kinetics’ Ovation Panels from the ceiling, adding High Tones Diffusers on the walls and Hardside Fabric Panels on the rear wall of this stunning, acoustically balanced auditorium. Acoustical panels and diffusers were also used in the music rehearsal rooms.
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