Acoustical Design:

EXPOSED STRUCTURE

Inspiring Great Spaces®
Preserve an industrial visual with acoustic solutions attached or applied directly to structure, or create a design statement that puts acoustical materials front and center. We’ve got the broadest portfolio of ceiling and wall options to get the look you want and control noise, so you can achieve the best of both worlds. Optimize performance in the workplace, in educational facilities, and hospitality with the right aesthetics and acoustics for the space.
Get the look you want with the right acoustics for your next exposed structure project with a custom Reverberation Report. It will help you compare acoustical solutions and suggest coverage recommendations to meet the needs of your project. armstrongceilings.com/reverbrequest

For unique, one-of-a-kind ideas, contact the YOU INSPIRE™ Solutions Center. We’ll help you bring your ideas to life! armstrongceilings.com/youinspire
**Hidden Acoustics**

Within the Structure

---

**Featured Horizontal Acoustics**

Covering More Visual Space

---

**Featured Vertical Acoustics**

Provides a More Open Visual

---

**Deck Coverage / Noise Reduction**

Reverberation Time (RT)

<table>
<thead>
<tr>
<th>1,000 ft (25' x 40')</th>
<th>Exposed Structure (15' to metal deck), drywall with 20% window coverage, commercial carpet</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD</td>
<td>RT=1.4s (1,000 ft)</td>
</tr>
<tr>
<td># of 24&quot; x 48&quot; LYRA® PB Direct-Apply Panels</td>
<td>30</td>
</tr>
<tr>
<td>% of Deck Coverage</td>
<td>24%</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

---

**Layout solution shown represents BETTER reverberation time**

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**Hidden Acoustics / Featured Horizontal Acoustics / Featured Vertical Acoustics?**

It’s up to you. They all absorb noise effectively.

---

Hidden Acoustics

Within the Structure

---

Visible Exposed Structure

53%

---

Featured Horizontal Acoustics

Covering More Visual Space

---

Visible Exposed Structure

63%

---

Featured Vertical Acoustics

Provides a More Open Visual

---

Visible Exposed Structure

97%

---

It's up to you. They all absorb noise effectively.

---

Hidden Acoustics

Within the Structure

---

Visible Exposed Structure

53%

---

Featured Horizontal Acoustics

Covering More Visual Space

---

Visible Exposed Structure

63%

---

Featured Vertical Acoustics

Provides a More Open Visual

---

Visible Exposed Structure

97%
Blades & Baffles

ALL ABOUT THE LINES

Straight or wavy, parallel or intersecting, monochromatic or multi-colored – these vertical elements control noise with panache.
FeltWorks® Blades

**FELTWORKS® Blades Quiet in a Kit**

Quiet spaces and redefine the visual plane, changing the topography of the ceiling while adding warmth to spaces.

- Installs with Aluminum Suspension Bar and aircraft cables
- Up to 0.70 Sabins/SF
- 3/8” thick blades provide a sleek linear visual – 3 standard profiles and a variety of blade heights offer dramatic visuals
- Part of the Sustain® portfolio, meeting the most stringent industry sustainability standards today

**FeltWorks® Blades Noise Reduction**

- 1,000 ft² Exposed Structure (15% to metal deck; 20% window coverage, commercial project)
- # of 10 x 96 x 3/8” Blades
- % of Deck Coverage

<table>
<thead>
<tr>
<th># of 10 x 96 x 3/8” Blades</th>
<th>50</th>
<th>90</th>
<th>207</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Deck Coverage</td>
<td>1%</td>
<td>2%</td>
<td>5%</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)
SOUNDSCAPES® Blades

ALL ABOUT THE SPACE

Reduce noise with new layout designs, coupled with size, shape, and color to allow for a unique look for any space.

- Flexible installation from the deck, ceiling, drywall, suspension system, or on a wall
- Excellent sound absorption — 1.38 Sabins/SF
- Over 20 standard sizes with custom shape and color options available
- Seismic-tested

<table>
<thead>
<tr>
<th># of 22 x 46 x 2” Blades</th>
<th>20</th>
<th>40</th>
<th>86</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Deck Coverage</td>
<td>1%</td>
<td>3%</td>
<td>6%</td>
</tr>
</tbody>
</table>

- Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
- Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

SoundScapes® Blades wall application
Armstrong Campus, Lancaster, PA

SoundScapes® Blades vertical panels in wavelengths
Interstate Drywall Corporate Office, Lyndhurst, NJ

SoundScapes Blades: click to see more

SoundScapes Blades Walls: click to see more
Love the look and control the noise with easy-to-install acoustical baffles.

- Available in a variety of sizes and standard, custom, and sailcloth fabrics
- Sleek, adjustable aircraft cable installation
- Coordinate Soundsoak® Baffles with Soundsoak Fabric Wall panels

**SOUNDSOAK® Baffles Noise Reduction**

<table>
<thead>
<tr>
<th>Reverberation Time (RT)</th>
<th>1,000 ft Exposed Structure</th>
<th>1,000 ft Metal Deck, Drywall</th>
<th>20% Window Coverage, Commercial Carpet</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETTER**</td>
<td>RT=1.0s</td>
<td>RT=0.6s</td>
<td>RT=0.6s</td>
</tr>
<tr>
<td>BEST**</td>
<td>RT=0.6s</td>
<td>RT=0.4s</td>
<td>RT=0.6s</td>
</tr>
<tr>
<td># of 24 x 48 x 2” Baffles</td>
<td>14</td>
<td>27</td>
<td>58</td>
</tr>
<tr>
<td>% of Deck Coverage</td>
<td>1%</td>
<td>2%</td>
<td>4%</td>
</tr>
</tbody>
</table>

* Long RTs (≥ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

Soundsoak® Baffles Custom panel sizes in Sailcloth Fabric
Northern Rockies Regional Recreation Centre, Fort Nelson, BC, Canada

Soundsoak® Baffles and Soundsoak® Walls Panels; Martin Luther King Elementary, Lancaster, PA
TECTUM® Blades & Baffles
MADE TO FIT

Customize the edges, heights, and thickness of panels for the acoustics and aesthetics you need.

- Living Product Challenge Imperative Certification – 1” thick panels in White and Natural only
- Upscale linear visual adds acoustics and aesthetics to any space
- Custom shapes and sizes available to meet your project demands
- Suspend with aircraft cable or hanger wire

TECTUM® BLADES & BAFFLES NOISE REDUCTION

<table>
<thead>
<tr>
<th>No of 24 x 48 x 1”</th>
<th>75</th>
<th>148</th>
<th>312</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blades &amp; Baffles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Deck Coverage</td>
<td>3%</td>
<td>5%</td>
<td>10%</td>
</tr>
</tbody>
</table>

* Living (RT≥ 1.4 sec), for lively acoustic environments (auditoriums/hospitality)
** Short (RT≤ 1.0 sec), for high-quality speech intelligibility (classrooms/open plan spaces)

Tectum® Blades custom vertical panels
iFly Indoor Skydiving Family Fun Center, King of Prussia, PA; Stantec, Philadelphia, PA

Tectum® Baffles; Capital One Labs, San Francisco, CA; Studio O+A, San Francisco, CA

Aircraft Cable
Steel Channel
1/8" Thick Tectum® Blade
PVC Insert
1-1/2" Thick Tectum® Blade
Create a look that visually tells your story.
Durable and flexible.

- Join or cut panels for creative design layouts and easy installation
- Six standard Effects™ Wood Looks finishes
- Panel spacing is variable for a variety of design and acoustical needs
- Custom blade heights and widths to meet your design needs

MetalWorks™ Blades – Classics™ Panel Attachment Clip

Main Beam

MetalWorks™ Blades – Classics™ Panel

METALWORKS™ Blade Noise Reduction

<table>
<thead>
<tr>
<th>Blades Per Line</th>
<th>% of Deck Coverage</th>
<th>RT</th>
<th># of Blades</th>
<th>Width (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>6%</td>
<td>1.4</td>
<td>179</td>
<td>0</td>
</tr>
<tr>
<td>179</td>
<td>12%</td>
<td>1.0</td>
<td>377</td>
<td>0</td>
</tr>
<tr>
<td>377</td>
<td>25%</td>
<td>0.6</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

MetalWorks™ Blades – Classics™ in Effects™ Finish, Cuesta College, Casa Robles, CA; PMSM Architects, San Luis Obispo, CA

MetalWorks™ Blades – Classics™ in Effects™ Finish, Fine Fissured™ Acoustical panels installed above blades; NN, Inc. at Waverly Hub; Charlotte, NC

IA Interiors Architects, Charlotte, NC – You Inspire™ Solutions Center

MetalWorks Blades: click to see more
Canopies & Clouds

TWO-FACED ACOUSTICS

Both sides of the panels soak up the sound. Select from a wide range of standard and custom shapes, colors, perforations, and materials.

© Serpentina® Waves™
University of Florida Chemical Biology Building, Gainesville, FL; Stantec, Phoenix, AZ

Custom SoundScapes® Shapes; Gardere Wynne Sewell, LLP, Dallas, TX; Gensler, Dallas, TX – You Inspire™ Solutions Center
Deliver acoustics in playful installations with angles, layers, shapes, sizes, and colors.

- Aesthetically define spaces with excellent acoustical performance
- Quick to install from the deck, ceiling, drywall, suspension system, or on a wall in adjustable heights and angles
- Available in standard and custom shapes, sizes, and colors

**SOUNDSCAPES® SHAPES NOISE REDUCTION**

<table>
<thead>
<tr>
<th>Number of 48&quot; x 48&quot; Shapes</th>
<th>12</th>
<th>23</th>
<th>49</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Deck Coverage</td>
<td>19%</td>
<td>37%</td>
<td>78%</td>
</tr>
</tbody>
</table>

* Long RTs (≥1.4 sec) = lively acoustic environments (auditoriums/hospitality)
** Short RTs (<1 sec) = high-quality speech intelligibility (classrooms/open-plan spaces)
**SoundScapes® Canopies**

**HANGIN’ AROUND**

Floating acoustics, placed exactly where you need them most.

- Hill and Valley shape canopies
- Aesthetically define spaces and enhance acoustics
- Ideal in spaces where viewed from above and below, such as mezzanines, since clouds are fully finished on all sides
- Quick to install from the deck, ceiling, drywall, suspension system
- Canopy kits include easy-to-install cable and hardware

<table>
<thead>
<tr>
<th>SoundScapes® Canopies Noise Reduction</th>
<th>Reverberation Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 ft² Exposed Structure (15’ to metal deck), drywall with 20% window coverage, commercial setup</td>
<td>RT=1.4s</td>
</tr>
<tr>
<td>4’ x 4’ Canopies</td>
<td>17</td>
</tr>
<tr>
<td>% Coverage (horz. face vs. floor)</td>
<td>41%</td>
</tr>
</tbody>
</table>

* Long RTs (> 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

**Adjustable Aircraft Cable**

*SoundScapes® Acoustical Canopies and Optima® Capz™ 4’ X 4’ with White caps
Morningstar Enterprises Inc., Kelowna, British Columbia, Canada

*SoundScapes® Acoustical Canopies; United Health Administrative Office Building, Fresno, CA; Neenan Archistruction, Fort Collins, CO
Tectum® Shapes: EXPRESSIVE

Standard or custom shapes to meet your specifications.

- Tectum panels are Living Product Imperative Certified by the International Living Future Institute – 1” panels in White and Natural only.
- Wide variety of color options available for field paint on site without impacting acoustics.
- Custom shapes, colors, and sizes for any project need.
- Durable and flexible, installs on walls or ceilings.

TECTUM® SHAPES NOISE REDUCTION

<table>
<thead>
<tr>
<th>Reverberation Time (sec)</th>
<th># of 48 x 48 x 1-1/2” Shapes</th>
<th>% of Deck Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD*</td>
<td>23</td>
<td>37%</td>
</tr>
<tr>
<td>BETTER**</td>
<td>44</td>
<td>70%</td>
</tr>
<tr>
<td>BEST**</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

TECTUM® Clouds: FLOATING NOISE CONTROL

Acoustical performance and design flexibility.
**FORMATIONS™ Clouds**

**OUT OF THE BOX**

Floating circular or rectangular clouds with crisp Axiom® trim pre-cut and ready to install.

- Easy-to-specify and install cloud system with pre-cut components and a wide range of specialty options like wood and metal
- Reduce noise levels in open spaces

**FORMATIONS™ CLOUDS NOISE REDUCTION**

<table>
<thead>
<tr>
<th>Reverberation Time (s)</th>
<th>% Deck Coverage</th>
<th># of 8&quot; x 86&quot; Ultima® Squares</th>
<th>RT 2023</th>
<th>RT 2021</th>
<th>RT 2018</th>
<th>RT 2017</th>
<th>RT 2016</th>
<th>RT 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good*</td>
<td>20%</td>
<td>4</td>
<td>N/A</td>
<td>0.7</td>
<td>0.9</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Better**</td>
<td>50%</td>
<td>8</td>
<td>N/A</td>
<td>0.5</td>
<td>0.6</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Best**</td>
<td>75%</td>
<td>N/A</td>
<td>N/A</td>
<td>0.3</td>
<td>0.4</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Long RTs (≥ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

### FORMATIONS™ Acoustical Accent Clouds; Collierville High School, Collierville, TN

Renaissance Group, Lakeland, TN

### FORMATIONS™ Clouds OUT OF THE BOX

Floating shaped clouds with geometric panels ready to install.

- Easy-to-specify and install cloud system with pre-cut suspension and trim components in a kit
- Shaped lighting options available from our DESIGNFlex™ partners

### DESIGNFlex™ for FORMATIONS™ MIX & MATCH

Floating shaped clouds with geometric panels ready to install.
It’s easy to improve acoustics, brighten, and add movement to any space.

- Choose from Hill, Valley, or S-curve dual radius canopies
- Real wood and bamboo veneers
- Perforated option available for sound absorption on Hill and Valley canopies
- Concealed mounting hardware for a clean look above and below
- Custom ACGI capabilities

**ACOUSTICAL WARMTH**
Now with more options than ever with ACGI custom capabilities.

**METALWORKS™**
**Canopies**

**RIPPLE EFFECT**
It’s easy to improve acoustics, brighten, and add movement to any space.

- Easy to clean and maintain
- Great aesthetic above and below
- Easy installation
- Available in a variety of micropert options

**WOODWORKS®**
**Canopies**

**NOW WITH MORE OPTIONS THAN EVER**
With ACGI custom capabilities.

**WOODWORKS® CANOPIES NOISE REDUCTION**

<table>
<thead>
<tr>
<th>METALWORKS® CANOPIES NOISE REDUCTION</th>
<th>Reverberation Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 ft Exposed Structure (15% to metal deck), drywall with 20% window coverage, commercial carpet</td>
<td></td>
</tr>
<tr>
<td># of 72” x 48” Canopies</td>
<td>% of Deck Coverage</td>
</tr>
<tr>
<td>7</td>
<td>38%</td>
</tr>
<tr>
<td>14</td>
<td>74%</td>
</tr>
<tr>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)
Serpentina®
Clouds & Canopies
GREAT CURVES

Curved metal clouds combine easy installation with striking visual power and acoustical performance.

- Maximum design flexibility — in both Classics and Waves
- Standard panel colors plus four metallic paints; custom colors available
- Install perforated clouds with acoustical infill panels for maximum sound absorption

Serpentina® Clouds & Canopies: click to see more
Flat Panels for Ceilings & Walls
SOUND DOWN

Flat panels for ceilings and walls add aesthetics and durability for your designs – in just about as many configurations as you can imagine. And there’s an installation option for your project.
TECTUM® Direct-Attach Panels

INTELLIGIBLE INSTRUCTION

Durable, sustainable noise control to withstand the crowds.

- Quick, easy install to wall, deck, or I-Beam using furring strips or truss fastening kit for truss installations
- Meet ANSI S12.60 requirements for physical education spaces
- Unlimited design flexibility — cut or paint panels in the field or factory to meet your design needs
- Durable for heavy-use interiors

Living Product Impervious Certified by the International Living Future Institute — 1” panels in White and Natural only

TECTUM® PANELS NOISE REDUCTION

<table>
<thead>
<tr>
<th>Reverberation Time (s)</th>
<th>1,000 ft² Opened Structure</th>
<th>10% of deck, minimal ceiling, minimal window coverage</th>
<th>0 % Window Coverage</th>
<th>Commercial Ceiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 354</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>30</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>40</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>50</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>60</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>70</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>80</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>90</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percentage of Deck Coverage

- Area of 1” Tectum® Direct-Attach Panel
- 24” x 48” = 115 sq ft
- 24” x 48” x 2 = 230 sq ft
- 24” x 48” x 3 = 345 sq ft

* Long RT (≥ 1.4 sec) for lively acoustic environments (auditoriums/hospitality)
** Short RT (< 1 sec) for high-quality speech intelligibility (classrooms/open plan spaces)
- Composite panel design combines Tectum® panel, acoustical infill, and furring strips in one for maximum sound control and fast, efficient installation
- Excellent sound absorption up to 1.0 NRC
- Durable for heavy-use interiors

**TECTUM® FINALE PANELS NOISE REDUCTION**

<table>
<thead>
<tr>
<th>Area of 1&quot; Tectum® Finale Panels</th>
<th>% of Deck Coverage</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>210 ft²</td>
<td>21%</td>
<td>GOOD* RT=1.4s</td>
</tr>
<tr>
<td>410 ft²</td>
<td>41%</td>
<td>BETTER** RT=1.0s</td>
</tr>
<tr>
<td>890 ft²</td>
<td>89%</td>
<td>BEST** RT=0.6s</td>
</tr>
</tbody>
</table>

*Long RTs (≤1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
**Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

**TECTUM® FINALE DIRECT-ATTACH PANELS**

- Easy installation on ceilings and walls with recommended adhesive to concrete, plaster, drywall and metal decking
- Made with a plant-based binder and part of the Sustain® portfolio of products
- High sound absorption up to NRC 0.95
- Made-to-order sizes and colors available
- For areas that need direct attachment rather than adhesive, consider Optima® Capz™

**LYRA® PB DIRECT-APPLY PANELS**

**QUICK & EASY**

Great acoustics, simple installation.

**LYRA® PB DIRECT-APPLY PANELS NOISE REDUCTION**

<table>
<thead>
<tr>
<th>Area of 1&quot; Lyra® PB Direct-Apply Panels</th>
<th>% of Deck Coverage</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 ft²</td>
<td>24%</td>
<td>GOOD* RT=1.4s</td>
</tr>
<tr>
<td>470 ft²</td>
<td>47%</td>
<td>BETTER** RT=1.0s</td>
</tr>
<tr>
<td>1000 ft²</td>
<td>100%</td>
<td>BEST** RT=0.6s</td>
</tr>
</tbody>
</table>

*Long RTs (≤1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
**Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)
FELTWORKS®
Acoustical Panels
INSTANT SOFTNESS
Absorb up to 70% of the sound that strikes them.

- Quick and easy retrofit with three installation methods
- No need to field-finish cut edges with color throughout panels
- Part of the Sustain® ceiling portfolio

FELTWORKS® PANELS NOISE REDUCTION

<table>
<thead>
<tr>
<th># of 1” Black FeltWorks Panels</th>
<th>8</th>
<th>15</th>
<th>31</th>
</tr>
</thead>
<tbody>
<tr>
<td># of 48 x 96 x 1” Panels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Deck Coverage</td>
<td>26%</td>
<td>48%</td>
<td>99%</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

- Magnet Attachment to Drywall Grid
- Magnet Attachment to 7/8” Hat Channel
- Magnet Attachment to 1-1/2” Hat Channel

FeltWorks panels: click to see more
INVISACOUSTICS™ Panels
ABRACADABRA

Empower your exposed structure design while bringing quiet to your space.

Direct-apply to concrete, plaster, and drywall ceilings and walls with recommended adhesive
- Footproof, all-in-one screw allows fast installation without danger of overdriving and damaging the panel
- Quick, easy install to wall, deck, or I-Beam using hat channel or furring strips – truss fastening kit for truss installations
- Field paintable option – can be sprayed same color as the deck

INVISACOUSTICS™ PANELS NOISE REDUCTION

<table>
<thead>
<tr>
<th>1,000 ft² Exposed Structure w/ 20% window coverage</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3' I-Beam deck, drywall</td>
<td>GOOD* (RT=1.4s)</td>
</tr>
<tr>
<td>550 ft² drywall with 20% window coverage</td>
<td>BETTER** (RT=1.0s)</td>
</tr>
<tr>
<td>28%</td>
<td>Area of 3/4” InvisAcoustics™ Panels: 280 ft²</td>
</tr>
<tr>
<td>30%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* Long RTs (≥1.4 sec) = for lively acoustic environments (auditoriums, hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms, open plan spaces)
Large format acoustical panels quiet spaces.

- 48” x 96” panels for sleek, monolithic look
- Easy alignment suspension system
- Panels can be designed in long runs or grouped based on the acoustical needs
- Absorbs up to 90% of the sound that strikes it

**OPTIMA® CAPZ™ NOISE REDUCTION**

<table>
<thead>
<tr>
<th>RT</th>
<th>Area of Optima® Capz™ Panels</th>
<th>% Coverage (horiz. face vs. floor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4s</td>
<td>190 ft²</td>
<td>19%</td>
</tr>
<tr>
<td>1.0s</td>
<td>370 ft²</td>
<td>37%</td>
</tr>
<tr>
<td>0.6s</td>
<td>800 ft²</td>
<td>80%</td>
</tr>
</tbody>
</table>

* Long RTs (1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

OPTIMA® CAPZ™ ACCENT HARDWARE

Capz™ accent hardware pairs with MetalWorks™ panels and standard grid.

**METALWORKS™ CAPZ™ NOISE REDUCTION**

<table>
<thead>
<tr>
<th>RT</th>
<th>Area of MetalWorks™ Capz™ Panels</th>
<th>% of Deck Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4s</td>
<td>200 ft²</td>
<td>20%</td>
</tr>
<tr>
<td>1.0s</td>
<td>400 ft²</td>
<td>40%</td>
</tr>
<tr>
<td>0.6s</td>
<td>850 ft²</td>
<td>85%</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)
- Easy-to-install wall system available in a variety of standard and custom fabrics
- Create your own design
- Variety of impact resistant acoustical wall panels available for high-traffic and high-abuse areas
- Available in multiple standard and custom sizes and shapes

**SOUNDSOAK® PANELS NOISE REDUCTION**

<table>
<thead>
<tr>
<th>Reverberation Time (RT)</th>
<th># of 24 x 96 x 1&quot; Panels</th>
<th>% of Wall Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD*</td>
<td>20</td>
<td>13%</td>
</tr>
<tr>
<td>BETTER**</td>
<td>38</td>
<td>26%</td>
</tr>
<tr>
<td>BEST**</td>
<td>68</td>
<td>56%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reverberation Time (RT)</th>
<th># of 48&quot; x 48&quot; Hexagon Panels</th>
<th>% of Wall Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOOD*</td>
<td>20</td>
<td>14%</td>
</tr>
<tr>
<td>BETTER**</td>
<td>38</td>
<td>26%</td>
</tr>
<tr>
<td>BEST**</td>
<td>82</td>
<td>56%</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

- Installs on walls or ceilings
- Quick to install from the deck, ceiling, drywall, suspension system, or on a wall in adjustable heights and angles
- Available in multiple standard and custom sizes

*SOUNDSCAPES®® Shapes
SOAK UP THE EXCITEMENT
Reduce noise and add character.
WOODWORKS® Wall Panels

ADD ANOTHER DIMENSION

Accentuate one or more walls while improving sound quality.

- Install on the wall, the ceiling, or create 90° angled ceiling-to-wall transitions
- Perforated panel with acoustical backing improves sound quality and reduces noise within a space
- Shorter lead times and lower cost than custom millwork

WOODWORKS® WALL PANELS NOISE REDUCTION

<table>
<thead>
<tr>
<th>Area of WoodWorks® Wall Panels</th>
<th>% of Wall Coverage</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 ft² Exposed Structure (15% metal deck, drywall) with 20% window/interior;</td>
<td>11%</td>
<td>GOOD*; RT = 1.4 sec</td>
</tr>
<tr>
<td>214 ft²</td>
<td>22%</td>
<td>BETTER**; RT = 1.0 sec</td>
</tr>
<tr>
<td>520 ft²</td>
<td>47%</td>
<td>BEST**; RT = 0.6 sec</td>
</tr>
</tbody>
</table>

* Long RTs (≤ 1.4 sec) = for lively acoustic environments (auditoriums/hospitality)
** Short RTs (< 1 sec) = high-quality speech intelligibility (classrooms/open plan spaces)

WoodWorks® Channelled Walls, College Football Hall of Fame, Atlanta, GA; tvsdesign, Atlanta, GA

ACGI Custom Panels

WARM WOOD WITH ACOUSTICS

Perforated wood backed with hidden acoustics.

ACGI Custom Walls: click to see more
EXPOSED STRUCTURE ACOUSTICAL DESIGN

Acoustical absorption is important to:
- Reduce noise levels and reverberation time
- Enhance speech intelligibility

Reverberation Time (RT)
Reverberation Time (RT) is the persistence of sound in an enclosed space after the source of the sound has stopped. The level of the reverberant sound within a room is dependent upon both the volume of the room and the amount of sound absorption installed within the room, such that small hard-surfaced rooms are “louder” than large well-treated rooms.

With our TechLine Reverberations Reports you can calculate approximate revert times for your space as you design. Compare the times of your product choices to find out which ones will work best with your space and design.

Rules of thumb:
Short RTs (< 1 sec) are preferred for high-quality speech intelligibility in classrooms and open plan office spaces.

Long RTs (≤ 1.4 sec) are preferred for lively acoustic environments such as auditoriums and hospitality.

Acoustical solutions, like Canopies, Clouds, Baffles, or Blades vertical elements installed in a way that covers 20% to 50% of the ceiling, will provide significant reverberation time improvement to an exposed structure installation, since sound is absorbed from both the front and back of the panels. Blades are especially effective as the required coverage is much smaller to get the RT reduction because most of the surface area is vertical.

Direct-to-structure solutions on decks or walls absorb sound from one side.

Our Acoustical Experts have done the math for you on the product recommendation charts on pages 52 and 53. You’ll be able to compare products to see the recommended coverage for GOOD, BETTER, or BEST performance levels to reduce reverberation times.

Comparison: Exposed Structure Options Versus Continuous Ceiling

<table>
<thead>
<tr>
<th>Deck</th>
<th>Exposed Structure</th>
<th>Blades &amp; Baffles</th>
<th>Direct-To-Deck</th>
<th>Canopies &amp; Clouds</th>
<th>Wall Panels</th>
<th>Continuous Optima Ceiling (100% Coverage)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Treatment (0% Coverage)</td>
<td>SoundScapes® Blades (4% ceiling coverage, 196 ft² of material)</td>
<td>InvistaAcoustics™ Shapes (50% coverage)</td>
<td>SoundScapes® Wall Panels (50% coverage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,000 SF Exposed Structure (40’ x 25’) 1/2” to deck, drywall with 20% window coverage and commercial carpet</td>
<td>30 Blades (10 x 94 x 2”)</td>
<td>62 Panels (24 x 48 x 3/4”)</td>
<td>32 Shapes 48” x 48” Squares</td>
<td>2 Walls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Absorption</td>
<td>0</td>
<td>1.38 Sabins/SF</td>
<td>0.75 NRC</td>
<td>1.49 Sabins/SF</td>
<td>0.70 NRC</td>
</tr>
<tr>
<td></td>
<td>Reverberation Time (RT)</td>
<td>2.4 sec</td>
<td>1.2 sec</td>
<td>1.1 sec</td>
<td>0.8 sec</td>
<td>0.3 sec</td>
</tr>
<tr>
<td></td>
<td>Reverberation Time Improvement</td>
<td>–</td>
<td>50%</td>
<td>54%</td>
<td>67%</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>Noise Reduction</td>
<td>–</td>
<td>-2.0 dB</td>
<td>-2.6 dB</td>
<td>-3.6 dB</td>
<td>-7.5 dB</td>
</tr>
</tbody>
</table>

BRING DOWN THE NOISE
IN EXPOSED STRUCTURE SPACES

How do non-traditional shapes and forms affect noise levels? These products absorb sound from all sides to reduce reverberation times. So placement in about 20-50% of the space gives you impactful acoustical performance to Bring Down the Noise.
REDUCE REVERBERATION TIME & IMPROVE ACOUSTICS RECOMMENDATIONS

For each of the products featured in this brochure, here are recommendations for the square-foot area to treat to achieve reverberation times at three different levels:

**BEST** levels are recommended to meet specific standards, such as ANSI S12.60 in classrooms, LEED®, and WELL Building Standard™.

**GOOD** levels are suitable for casual spaces such as music performance and hospitality.

**BETTER** levels are appropriate for collaborative spaces like cafes, corridors, and lobbies where speech privacy is not critical.

To contact your Armstrong Ceilings Representative or TechLine for a detailed reverberation time calculation for your project, a custom Reverberation Report will provide you with recommended acoustical solutions or request your own by visiting armstrongceilings.com/reverberqueue.

### BLADES & BAFFLES

<table>
<thead>
<tr>
<th>Model Room</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FeltWorks® Blades</td>
<td>Area of Blades 333 R²</td>
</tr>
<tr>
<td>SoundScapes® Blades</td>
<td>Area of Blades 141 R²</td>
</tr>
<tr>
<td>Soundtack® Baffles</td>
<td>Area of Baffles (Sailcloth) 112 R²</td>
</tr>
<tr>
<td>Tectum® Blades</td>
<td>Area of Blades 600 R²</td>
</tr>
<tr>
<td>Tectum® Blades</td>
<td>Area of Blades 600 R²</td>
</tr>
<tr>
<td>MetalWorks® Blades</td>
<td>Area of Blades 240 R²</td>
</tr>
</tbody>
</table>

### CLOUDS & CANOPIES

For each of the products featured in this brochure, here are recommendations for the square-foot area to treat to achieve reverberation times at three different levels:

<table>
<thead>
<tr>
<th>Model Room</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoundScapes® Shapes</td>
<td>Area of Shapes 192 R²</td>
</tr>
<tr>
<td>SoundScapes® Canopies</td>
<td>Area of Canopies 216 R²</td>
</tr>
<tr>
<td>Tectum® Shapes &amp; Clouds</td>
<td>Area of Clouds 368 R²</td>
</tr>
<tr>
<td>Formations® Clouds</td>
<td>Area of Clouds 256 R²</td>
</tr>
</tbody>
</table>

### CLOUDS & CANOPIES (CONTINUED)

<table>
<thead>
<tr>
<th>Model Room</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designflex® for Formations® Acoustical Clouds</td>
<td>Area of Clouds 256 R²</td>
</tr>
<tr>
<td>Tectum® Finale</td>
<td>Area of Clouds (R062 w/infill) 192 R²</td>
</tr>
<tr>
<td>Soundtack® Blades</td>
<td>Area of Blades (Fabric) 280 R²</td>
</tr>
<tr>
<td>Tectum® Finale</td>
<td>Area of Ceiling Panels 210 R²</td>
</tr>
<tr>
<td>Tectum® Finale</td>
<td>Area of Ceiling Panels (D-40) 280 R²</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels 35</td>
</tr>
<tr>
<td>Optima® Capz®</td>
<td>Area of Ceiling Panels 190 R²</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Wall Panels (Fabric) 256 R²</td>
</tr>
<tr>
<td>Tectum® Finale</td>
<td>Area of Ceiling Panels (Fabric) 16</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Wall Panels 214 R²</td>
</tr>
</tbody>
</table>

### DIRECT-TO-STRUCTURE

<table>
<thead>
<tr>
<th>Model Room</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoundScapes® Shapes</td>
<td>Area of Wall Panels 266 R²</td>
</tr>
<tr>
<td>Tectum® Direct-Attach Panels</td>
<td>Area of Ceiling Panels 20 R²</td>
</tr>
<tr>
<td>Tectum® Direct-Attach Panels</td>
<td>Area of Ceiling Panels (C-20 Mount) 222 R²</td>
</tr>
<tr>
<td>Tectum® Canopies</td>
<td>Area of Ceiling Panels (D-40) 280 R²</td>
</tr>
<tr>
<td>Tectum® Canopies</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>Tectum® Canopies</td>
<td>Area of Ceiling Panels (A-Mount) 30</td>
</tr>
<tr>
<td>Tectum® Canopies</td>
<td>Area of Ceiling Panels (A-Mount) 240 R²</td>
</tr>
<tr>
<td>Tectum® Blades</td>
<td>Area of Ceiling Panels (A-Mount) 30</td>
</tr>
<tr>
<td>Tectum® Blades</td>
<td>Area of Ceiling Panels (A-Mount) 256 R²</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
<tr>
<td>InvisAcoustics® Panels</td>
<td>Area of Ceiling Panels (D-40) 35</td>
</tr>
</tbody>
</table>

### WALL PANELS

<table>
<thead>
<tr>
<th>Model Room</th>
<th>Reverberation Time (RT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MetalWorks® Canopies</td>
<td>Area of Wall Panels 200 R²</td>
</tr>
<tr>
<td>WoodWorks® Wall Panels</td>
<td>Area of Wall Panels 890 R²</td>
</tr>
<tr>
<td>WoodWorks® Wall Panels</td>
<td>Area of Wall Panels 214 R²</td>
</tr>
</tbody>
</table>

**Note:** Indicates that the option is not recommended to achieve a BEST level reverberation time.

% of Deck Coverage is defined as the visible deck area covered by a ceiling solution.
No matter what type of space you are designing, Armstrong has a broad range of solutions to meet your acoustic and aesthetic needs. Bring down the noise in exposed structure spaces with Clouds & Canopies, Blades & Baffles, and Direct-to-Structure solutions — or get Total Acoustics® performance with wall-to-wall ceilings where quiet concentration and privacy are needed.
TAKE THE NEXT STEP

1 877 276 7876
Customer Service Representatives
7:45 a.m. to 5:00 p.m. EST
Monday through Friday

TechLine – Technical information, detail drawings, CAD design assistance, installation information, other technical services – 8:00 a.m. to 5:30 p.m. EST, Monday through Friday. FAX 1 800 572 8324 or email: techline@armstrongceilings.com

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