PLACES TO LEARN

CEILING SYSTEMS THAT MAKE A DIFFERENCE IN EDUCATIONAL FACILITIES
Whether orchestrating a dramatic and engaging impression or creating a high performance classroom for better learning, you can rely on Armstrong Ceiling and Wall Systems for products that deliver the performance your school needs – room to room – from high acoustics in the classroom to tough durability in the hallways…from wow entryways to dynamic auditoriums.
HEARING & UNDERSTANDING
Teachers can’t teach and students can’t learn in a noisy classroom full of distractions. Interference with the ability to hear increases stress, decreases concentration, and interferes with learning. Proper classroom acoustics are extremely important for younger children, students with learning disabilities, the hearing impaired, and English as a second language students. And let’s not forget teachers; teacher surveys consistently rank noisy classrooms and vocal fatigue high on their list of frustrations.

SEEING THINGS CLEARLY
Proper lighting is critical to effective learning too. Poor lighting and glare in the classroom can cause eye strain and fatigue, hampering a student’s ability to concentrate. High light-reflectant ceilings can brighten classrooms by reflecting up to 90% of the light striking their surfaces – creating brighter, more evenly lit spaces. These ceilings can help reduce total building energy savings by as much as 11%.

IMPACTING YOUR IMAGE
Many schools have signature spaces that tell the world who they are, impacting the ability to recruit students and faculty, endowments, and community goodwill. Presenting a professional, innovative, and sophisticated image has never been more important. With a variety of upscale, inspiring options, including WoodWorks®, MetalWorks™, SoundScapes®, Ultima® Create!™, and Infusions® panels, there’s a product to help you create a space that inspires.

PROTECTING STUDENTS AND THE ENVIRONMENT
Armstrong is committed to offering sustainable solutions for schools and universities. Our portfolio in metal, wood, mineral fiber, and fiberglass all contribute to the United States Green Building Council (USGBC) LEED® for School credits. Our acoustical offering is designed specifically to meet the reverberation and acoustical requirements for classrooms. Many of the products contain recycled content (both post-consumer and pre-consumer), meet acoustic performance requirements, and can contribute to the construction waste management credits by diverting ceilings from landfill through the Armstrong Ceiling Recycling Program.

Armstrong® HumiGuard® Plus ceiling systems with BioBlock® Plus have a 30-Year Limited Ceiling Systems Warranty against the growth of mold and mildew, in addition to a warranty against visible sagging over time, a critical issue for schools when systems are shut down over summer.

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CLASSROOMS

On any given school day, thousands of students across the country are unable to understand 25 to 30 percent of what’s said in their classroom. The reason: excessive noise and reverberation within the classroom interferes with their ability to clearly hear their teacher. The result: a decreased level of concentration, an increased level of stress, and an overall reduction in the level of learning. To help create more effective spaces for teaching and learning, Armstrong offers a portfolio of ceilings that can substantially improve classroom acoustical design. School Zone® Fine Fissured™, Ultima®, Cirrus® High CAC, and Ultima® and Optima® Create!™ ceilings are all good choices for K-12 classrooms, while Optima, TechZone®
perforated WoodWorks® and MetalWorks™ panels provide higher end visuals. These ceilings feature greater sound absorption and impact resistance than most conventional ceiling panels used for classrooms.

ENTRYWAYS & HALLWAYS
First impressions in schools are important. Entryways and open area are great places to make a statement – especially in higher education. Our selection of canopies, clouds, wood, metal, and translucent ceilings in many forms offer design options limited only by the imagination.

MULTIPURPOSE SPACES & CAFETERIUMS
Cafeterias and multi-purpose spaces in schools typically have high levels of noise. The din of multiple voices speaking at once – in a space that is often an exposed structure design – contributes to low speech intelligibility, adding additional stress on students and faculty. Spot acoustical solutions such as Optima® Capz™ panels, SoundScapes® Shapes acoustical clouds, Soundsoak® baffles, or SoundScapes Blades™ panels can significantly lower noise levels in open, noisy areas.

FOCUS PRIVACY COLLABORATION

AUDITORIUMS & LIBRARIES
Acoustical performance and beauty play as much a part in the effectiveness and appeal of auditoriums and libraries, as the dramatics on stage. Armstrong has the largest portfolio of standard and custom acoustical and aesthetic ceiling options available in the industry today.

REDUCE NOISE THROUGH WALLS
Most interior walls are lightweight in design. As a result, noise transmission between rooms is a problem. The ANSI Standard specifies that the STC or sound transmission class of a wall separating two adjacent classrooms be 50 or greater. Adding fiberglass insulation in the wall cavity, adding a layer of gypsum board, and sealing infiltration gaps will help reduce noise transmission between rooms. Soundsoak® Acoustical Wall Systems are available in a wide variety of colors and textures and absorb 50-90% of sound striking the surface.

REDUCE HVAC NOISE
The main source of background noise in classrooms is often the HVAC system. The best acoustical design uses a centralized system, rather than individual room units. Air handlers and mechanical equipment should be located away from classrooms. Position rooftop equipment over hallways, cafeterias, and gymnasiums.
## RECOMMENDED PRODUCTS AT-A-GLANCE

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<tr>
<th>Space</th>
<th>How the Right Ceiling Can Help</th>
<th>Product Recommendations</th>
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| Libraries   | Students need a quiet space for thoughtful study, as well as a place that inspires creative thinking. Select ceilings that play equal parts acoustics and beauty. | - MetalWorks™  
- WoodWorks®  
- Calla®  
- Lyra™  
- Lyra™ High CAC  
- Ultima®  
- Ultima High NRC  
- School Zone® Fine Fissured™  
- School Zone® Georgian™  
- SoundScapes® Canopies, Shapes, and Blades™  
- Formations™ Acoustical Clouds  
- Serpentina® Classic, Vault, and Waves™  
- MetalWorks™ Blades – Classics™  
- Infusions® Blades – Concepts™, Canopies, Lay-in |
| Auditoriums | Play up drama with designs that set a stage, but also provide the acoustical performance that preserves sound quality. | - MetalWorks  
- WoodWorks  
- Calla  
- Lyra  
- Lyra High CAC  
- Ultima High NRC  
- Mesa™  
- TechZone® Ceiling Systems  
- School Zone Fine Fissured, Georgian  
- SoundScapes Canopies, Shapes, and Blades  
- Formations Acoustical Clouds  
- Serpentina® Classic, Vault, and Waves  
- MetalWorks Blades – Classics  
- Infusions Blades – Concepts, Wings |
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</thead>
</table>
| Classrooms    | Create better spaces for students to learn, and teachers to teach with the right balance of sound absorption and sound blocking. Consider specifying Total Acoustics™ performance ceilings to help you meet the ANSI standard and gain LEED® points. | • MetalWorks™  
• WoodWorks®  
• Calla™  
• Lyra™ High CAC  
• Ultima® High NRC  
• Ultima  
• Ultima® Health Zone™  
• Fine Fissured™ High NRC  
• Cirrus® & Cirrus® High NRC  
• SoundScapes® Canopies, Shapes, and Blades™  
• Formations™ Acoustical Clouds  
• Serpentina® Classic, Vault, and Waves™  
• MetalWorks™ Blades – Classics™  
• Infusions® Blades – Concepts™ |
| Corridors     | Help reduce unwanted noise coming from noisy corridors with high CAC ceilings, in addition to high STC walls. | • MetalWorks  
• WoodWorks  
• Calla  
• Lyra  
• Cirrus  
• Dune™  
• Mesa  
• Ultima  
• Mesa™  
• Georgian™  
• Graphis®  
• Metaphors® Coffers  
• Tundra®  
• Ultima  
• Lyra High CAC  
• TechZone® Ceiling Systems  
• School Zone® Fine Fissured  
• School Zone Georgian  
• SoundScapes Canopies, Shapes, and Blades  
• Formations Acoustical Clouds  
• Serpentina Classic, Vault, and Waves  
• School Zone® Fine Fissured™  
• School Zone® Georgian™ |
| Lobbies       | Design to make a great first impression. Lobbies and entryways are perfect places to make a statement that reflects the personality of an educational institution – especially in higher education. | • MetalWorks  
• WoodWorks  
• Calla  
• Lyra  
• Cirrus  
• Dune  
• Mesa  
• Ultima  
• Lyra High CAC  
• TechZone Ceiling Systems  
• School Zone Fine Fissured  
• School Zone Georgian  
• SoundScapes Canopies, Shapes, and Blades  
• Formations Acoustical Clouds  
• Serpentina Classic, Vault, and Waves  
• School Zone® Fine Fissured™  
• School Zone® Georgian™  
• Infusions Blades – Concepts |
| Cafeterias    | Treat these noisy areas to dampen the buzz of many voices talking all at once. Cafeterias and multipurpose areas are also places to have fun with design. | • MetalWorks  
• WoodWorks  
• Armatuff®  
• Create!™  
• Calla  
• Cirrus  
• Dune  
• Fine Fissured  
• Georgian  
• Graphis  
• Lyra  
• Mesa  
• Optima®  
• Optima® Health Zone™  
• Tundra  
• Ultima  
• Ultima Health Zone  
• TechZone Ceiling Systems  
• Lyra High CAC  
• School Zone Fine Fissured  
• School Zone Georgian  
• Optima®  
• Optima® Health Zone™  
• Tundra  
• Ultima  
• Ultima Health Zone  
• TechZone Ceiling Systems  
• Lyra High CAC  
• School Zone Fine Fissured  
• School Zone Georgian  
• Capz  
• SoundScapes Canopies, Shapes, and Blades  
• Serpentina Classic, Vault, and Waves  
• School Zone® Fine Fissured™  
• School Zone® Georgian™  
• Infusions Blades – Concepts  
• Infusions Blades – Concepts |
| Gymnasiums    | These booming spaces need a mix of durability and high acoustical performance. Quiet the boom of these large spaces with high NRC, impact-resistant ceilings. | • WoodWorks  
• Armatuff  
• Ceramaguard®  
• Optima  
• Lyra High CAC  
• School Zone Fine Fissured  
• School Zone Georgian  
• Canyon™  
• Capz  
• School Zone Fine Fissured  
• School Zone Georgian  
• Capz  
• School Zone Fine Fissured  
• School Zone Georgian  
• Soundsoak® Baffles  
• MetalWorks Blades – Classics  
• Infusions Blades – Concepts  
• Infusions Blades – Concepts |

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LEED CREDIT CONTRIBUTIONS FOR ACOUSTIC PERFORMANCE

Acoustical design solutions in schools can contribute to LEED for School credits for Acoustic Performance. In LEED, there is a prerequisite for minimum acoustic performance credit that is required on all LEED school projects, and a credit for Acoustic Performance. Design classrooms and other core learning spaces to include sufficient sound-absorptive finishes for compliance with the reverberation time requirements specified in ANSI Standard S12.60-2010, Part 1, Acoustical Performance Criteria, Design Requirements and Guidelines for Schools. The intent of the LEED credit is to provide classrooms that facilitate teacher-to-student and student-to-student communication through effective acoustic design.

Many states have adopted ANSI Standard S12.60 in recognition of the importance of good hearing environments to learning. This Standard focuses on speech intelligibility by setting maximum permissible levels for reverberation time to ensure that speech can be heard above the noise. Designing a classroom to meet the acoustical requirements of the ANSI Standard is neither difficult nor costly, if addressed early in the planning and design stages.

REDUCE REFLECTED SOUND

The level of reflected sound and the reverberation time can be reduced by adding sound absorbing material. For classrooms, especially in younger grade levels where teachers move throughout the classroom, and where ceiling heights are less than ten feet, the best placement of the sound absorbing material is the ceiling plane. A ceiling with an NRC (noise reduction coefficient) of at least 0.70 is recommended, meaning it will absorb 70% of the sound that strikes it.

REDUCE PLENUM NOISE

When walls don’t extend all the way from the floor to the deck above, noise can travel through the ceiling plenum from one classroom to another. To reduce the noise intrusion between classrooms, use an acoustical ceiling panel that has a high CAC or ceiling attenuation class value. The higher the value, the more sound blocking occurs as the ceiling creates a barrier to sound intrusion from one room to another.
MetalWorks® Torsion Spring panels in Laminates Rock Maple TCU Bass Hall Addition, Fort Worth, TX

Ultima® panels with Suprafine® 9/16" suspension system, and Axiom® Paired in custom color St. Thomas Aquinas HS, Ft. Lauderdale, FL
CEILINGS FOR PLACES TO LEARN

Ultima® Tegular panels with Prelude® 15/16” suspension system and Axiom® Classic trim
Albany Park Branch Library, Chicago, IL

MetalWorks™ RH215 Barrel Vault system in White
Miami University of Ohio, Oxford, OH
1 877 ARMSTRONG (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@armstrong.com

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