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OVERHEAD CANOPY DESIGN

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In this issue, we describe a canopy design using 2D shapes to provide omnidirectional scattering.

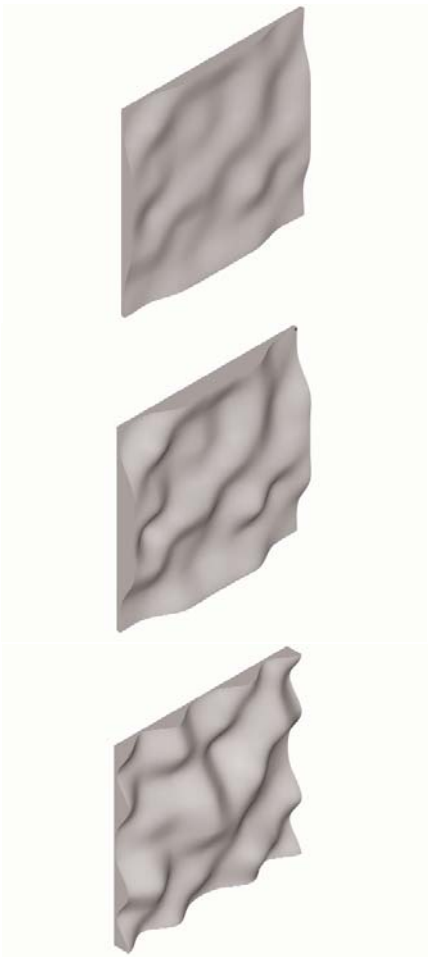

Figure 1. Top: 4' x 4' x2" Bicubic; Middle: 4' x 4' x 4" Bicubic; Bottom: 4' x 4' x 8" Bicubic

Globally Optimized 2D Bicubic

In previous issues, we have described how periodically repeating the same canopy shape decreases the uniformity of scattering, due to a concentration of the scattered sound in the diffraction directions, determined by the size of the repeating shape. We have shown how shape optimization in one direction can provide uniform scattering longitudinally, from front to back on stage or in the audience. We now describe the Bicubic™, which represents the next generation in 2D optimized acoustical canopy design offering uniform omnidirectional scattering. No other system provides the aesthetic and performance possibilities. The Bicubic is available in 4' x 4' panels in three depths of 2", 4" and 8", as shown in Figure 1. The units are fabricated in Class A GRG. The units seamlessly join in any orientation allowing a multitude of modulated surfaces using one asymmetric base shape, as shown in Figure 2. In Figure 3, we show an application of the first Bicubic cloud in Zionsville Fellowship.

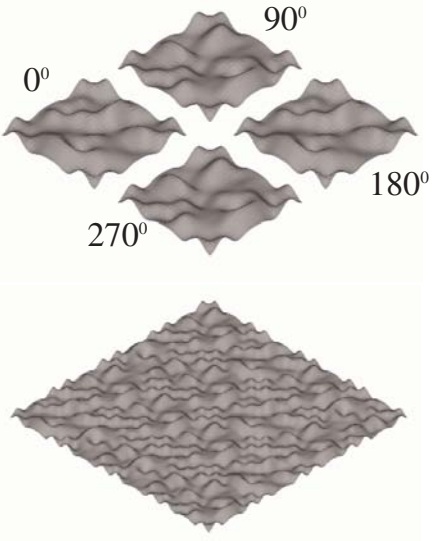

Figure 2. Top: Single asymmetric optimized base shape has zero gradient and equal displacement on all sides enabling the base shape to tile seamlessly in any orientation. Bottom: A 4x4 array shows how the base shape loses its identity forming a new aperiodic surface. Unlimited aperiodic shapes can be obtained by the orientation pattern.

Figure 3. Zionsville Fellowship, IN

2D Biradial

Figure 4. Biradial

The Biradial™, shown in Figure 4, was developed to address conventional aesthetic concerns, yet provide diffusion in two orthogonal directions. Though not as optimal as the Bicubic, the Biradial is curved along the length and width of the hall, thus providing scattering in both directions. RPG offers the Biradial™ in 1/8" and 1/4" Class A GRG, as well as 1 5/8" GHG. Panels can be field or factory painted as individual elements or joints can be taped forming a continuous surface and field painted. Installation is easy using integral metal hairpin hanging loops. The Biradial is 4' x 8' in 9" and 12" depths. Two different depths can be used for aperiodic modulation. In the next issue, we describe applications utilizing custom canopies that were optimized to address the needs of specific projects.