

Waveform *Monoradial*™

1D Diffusion



*Single Curvature GRG Arc Canopies
From The Acoustical Industry's Leading Innovator*

Overhead canopies are used in auditoriums to blend the direct and reflected sound and either increase intelligibility or enhance musical clarity and intimacy. Typically, canopy arrays are used instead of a solid ceiling to provide needed early reflections, while maintaining a desired reverberation time. Often, flat panel arrays are used for economy. However, flat panel arrays can potentially provide non-uniform scattered sound, due to the lack of scattering from gaps between the panels. One approach to help reduce this problem is to utilize shaping to provide diffusion. The simplest approach is a single curvature panel called the Monoradial™. The Monoradial™ is typically used to provide longitudinal (front-back) scattering to help minimize the problems from flat panels. RPG offers the Monoradial™ in Class A Glass Reinforced Gypsum and wood.



The Sound of Innovation™

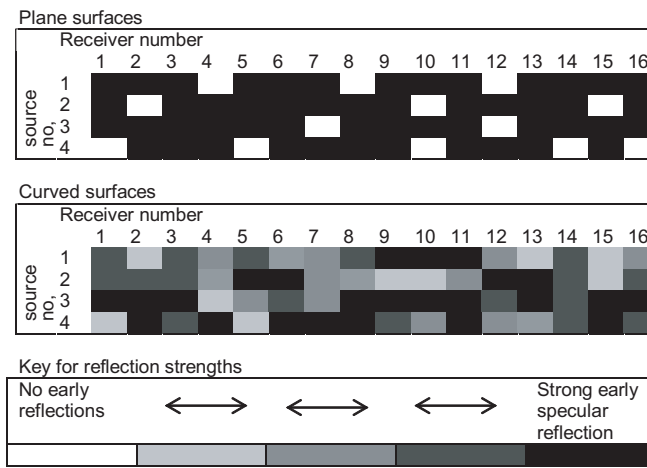
Problem and Solution

Problem

The figure shows coverage plot simulations from 4 sources to 16 receivers comparing spaced arrays of flat panels and curved panels. In the upper illustration, typical coverage holes are apparent. These coverage problems, which are due to the spaces between the panels, result when there is no ceiling panel to specularly reflect a source ray to a receiver.

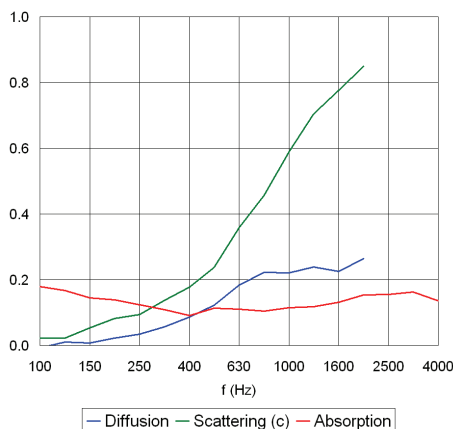
Solution

A simple conventional solution is to curve the panel in one direction forming an arc. In the middle illustration, it is apparent that the curve introduces scattering into non specular directions, partially solving the coverage problem. The level of the reflections is illustrated in the bottom graphic.



Performance Specifications

Monoradial Random Incidence Coefficients



The graph at the left shows the random incidence absorption, diffusion and correlation scattering coefficients.

Installation

Installation is simple using integral metal hair pin connectors. Simply attach engineered cables supplied with units.



FEATURES

- Simple arc shaping in Glass Reinforced Gypsum (GRG) or Wood
- GRG and wood meet Class A fire fire rating
- Various GRG thicknesses available
- GRG/Honeycomb/GRG (GHG) composite also available
- Field or factory finished
- Integrated mounting hardware
- Two different depths available
- Aperiodic modulation possible
- Optimal positioning and array spacing service

BENEFITS

- Curved shape improves coverage in one direction
- Conventional arc canopy design satisfies architectural concept for a canopy
- GRG is non-combustible and hence can be used in all applications requiring a Class A rated material
- The Monoradial™ is available in 1/8" and 1/4" thick GRG
- RPG also offers a novel GHG composite 1 5/8" thick for improved damping and stiffness
- Panels can be field or factory painted as individual elements or joints can be taped forming a continuous surface, which can be field painted
- Installation is quick and easy, using integral metal hairpin hanging loops and supplied cables
- The Monoradial is available in a 12" and 9" depth to suit different aesthetic considerations
- Two different depths with the same footprint allow aperiodic modulation to minimize periodicity effects
- RPG provides optimal positioning and array spacing as a free service to achieve optimal coverage

APPLICATIONS

Music rehearsal rooms, Auditoriums, Performance and Worship Spaces

SPECIFICATIONS

- Sizes:
- Wall:
- Ceiling:
- Surface weight between 3 and 5 lbs/sf
- Thickness: 1/8" and 1/4" GRG, 1 5/8" GHG
- Finish: Paint ready, field, or factory finished