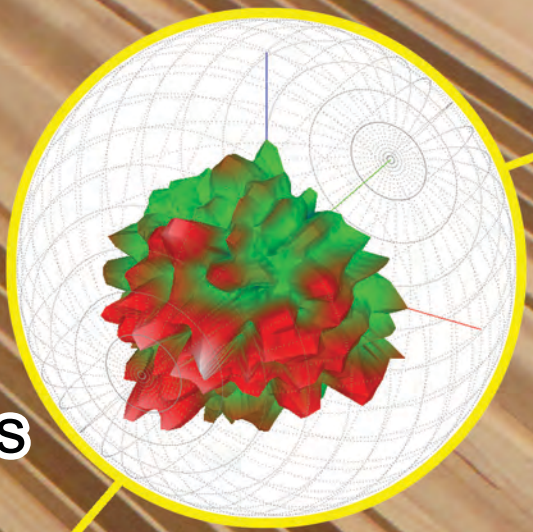
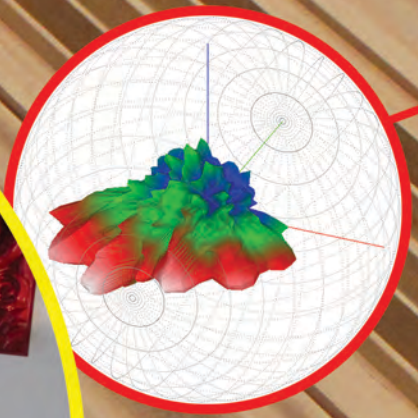
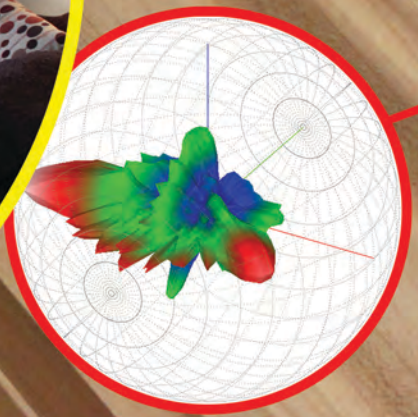
AcousticsFirst®

Diffuser Data

Acoustic Properties of
the *Art* ***Diffusor***® series
and more...







Diffusion - Diffraction - Scattering - Reflection

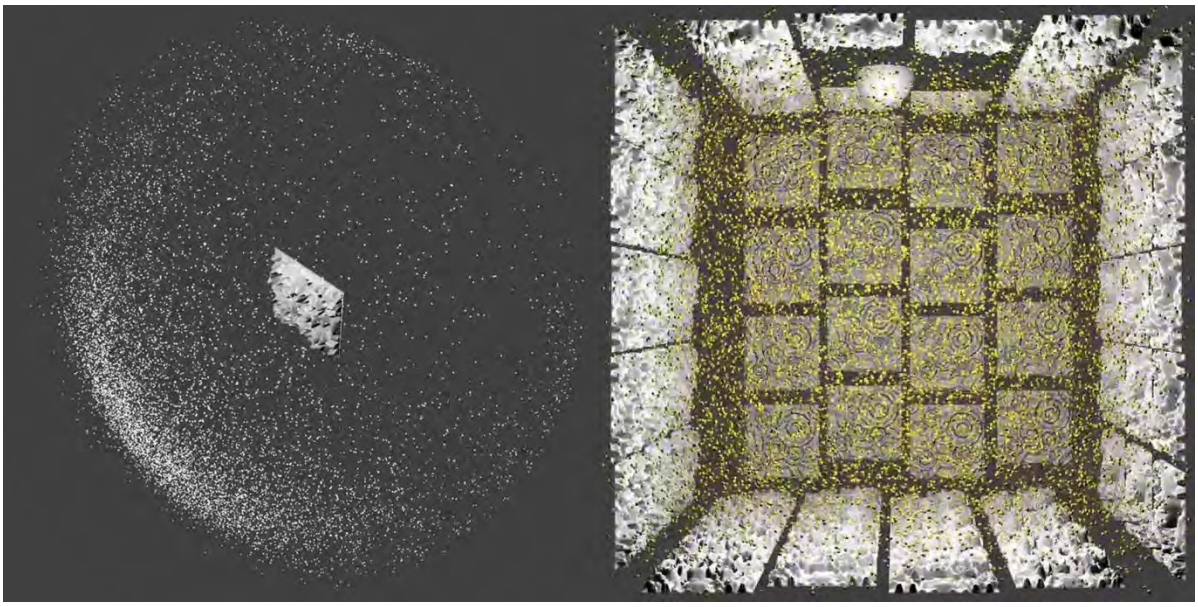
Toll-Free Number:

888-765-2900

The most important information about an acoustic device, such as a ‘diffuser’, is how that device affects sound. With technological advances accelerating at a staggering rate, we believed it would be advantageous to compile all of the measurable acoustic parameters of these devices, in order to develop an operating profile for each.

Sound absorption and sound reflection can both be measured with great accuracy, and in the absence of a universally excepted diffusion standard, Acoustics First is presenting the following data in good faith as we believe it represents the best of what is currently available.

Please note that we are using the word “diffusion”, in the broadest possible context as it relates to Diffusion, Diffraction, Scattering and Reflection.



Computer generated 3D particle modeling to simulate the "diffusion" of acoustic energy after impacting a surface.

Left: A single Diffuse Reflection. Right: Multiple Diffuse Reflections contributing to a Diffuse Field.

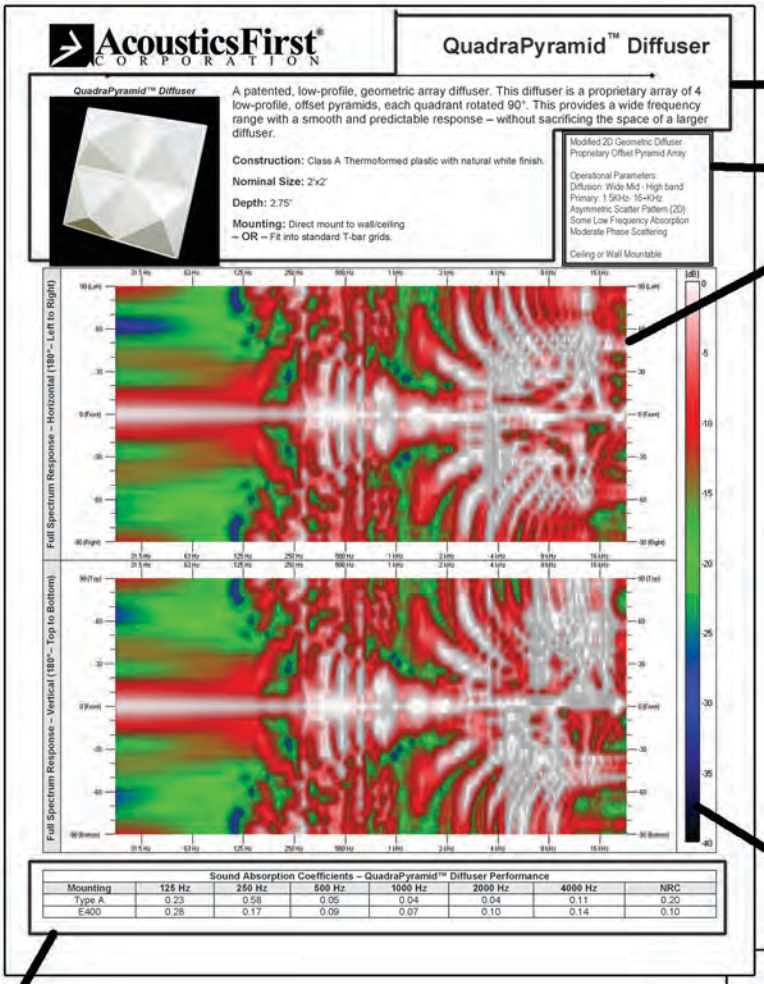
Excerpt from “Diffuse Reflections in Room Acoustics Modelling.” - Heli Nironen. 2004

Courtesy of Tapio Lokki, Used by Permission.

> “In room acoustics, the term diffusion denotes two conceptually different things. On one hand diffusion is a property of a sound field. It describes an isotropy of directional uniformity of sound propagation. Secondly, diffusion is an ability of a surface to scatter incident sound into non-specular directions. Although sound field diffusion may be a consequence of diffusely reflecting boundaries, both items must be well distinguished. The term scattering is somewhere used in connection with diffraction and elsewhere in connection with diffuse reflection. Others have considered different concepts used in context of diffuse reflection.
>
> They have defined and grouped applied terms in the following way:
>
> ***Diffraction.*** In a microscopic wave-theoretical view diffraction is one of the causes of diffuse reflection. In applied acoustics diffraction most often means edge diffraction from reflectors and similar objects.
>
> ***Scattering.*** Often used in general linear acoustics for the result of diffraction. In applied acoustics this term is used for reflection from a surface with roughness in a more general way.
>
> ***Diffuse reflection.*** The most appropriate term to describe the process of reflection from a diffusor or from a diffusive surface.”

Acoustics First Corporation · 2247 Tomlyn Street Richmond, VA 23230 USA · Phone (888) 765-2900 · Fax (804) 342-1107 · info@acousticsfirst.com · www.acousticsfirst.com

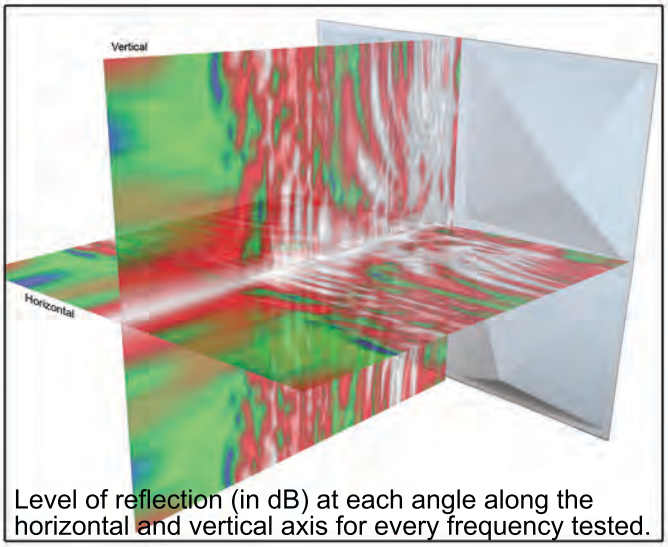
What information is in this document, and how do you read it?



Name, photograph, description, and materials.

Summary of Parameters.

Horizontal and vertical frequency maps.



Level of reflection (in dB) at each angle along the horizontal and vertical axis for every frequency tested.

Color Key for Acoustic Energy (dB)

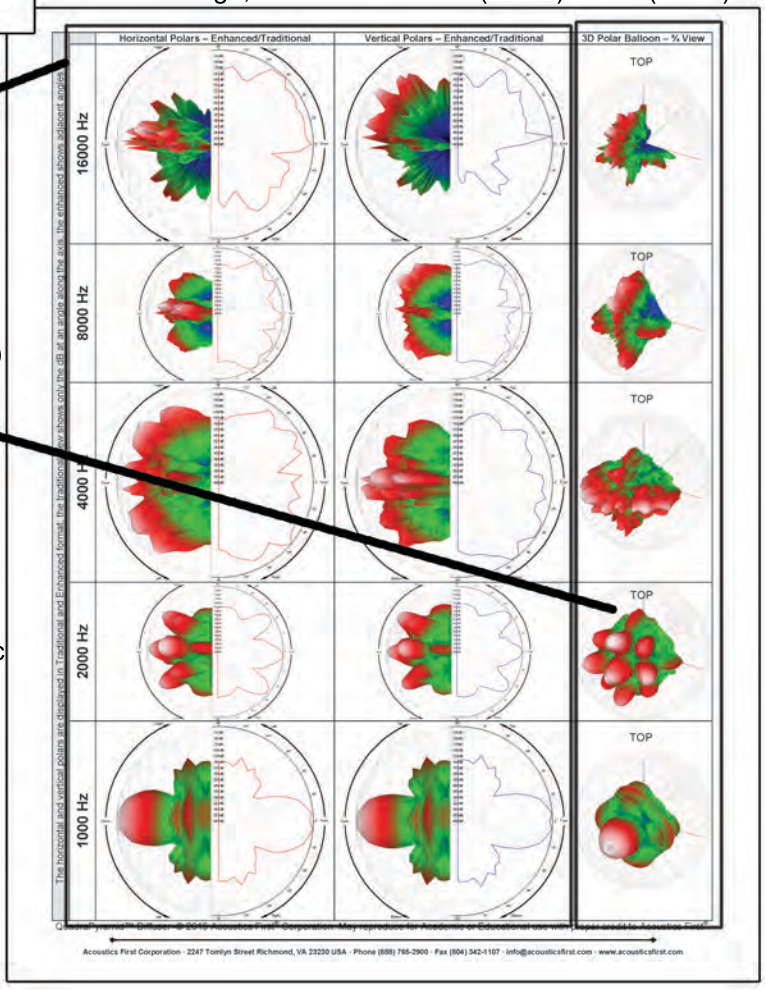
The colors correspond to energy in dB. It covers a 40 dB range, from the loudest 0 (White) to -40 (Black).

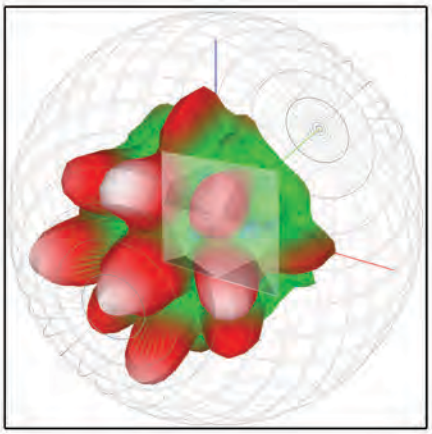
Sound Absorption Coefficients

Polar Response - Traditional and Enhanced

Traditional - Displays the level of reflection at each angle along the horizontal or vertical axis at a specific frequency. Level follows a polar grid in dB - marked from 0 to -40 dB.

Enhanced - Displays the level of reflection at each angle along the horizontal or vertical axis, including adjacent samples, at a specific frequency.
Level follows the same color key from above. (0 to -40 dB.)





3D Polar Balloon

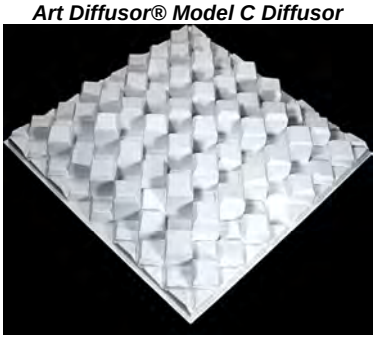
This is how a 2000 Hz signal will reflect off of a QuadraPyramid™.

If we could see acoustic energy, this is what it might look like.

Displays full hemispheric acoustic level (dB) response in front of the surface, at specific frequencies.
These use 1/3 octave smoothing.

Art Diffusor® Model C

Art Diffusor® Model C Diffusor



A patented, two dimensional, quadratic, binary array diffuser. This diffuser improves sound clarity and ambience while increasing the overall perceived space of the room. The range of the Model C is extended over other designs by its unique angled end caps to further control specular reflections above 4 kHz.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Size: 2'x2'

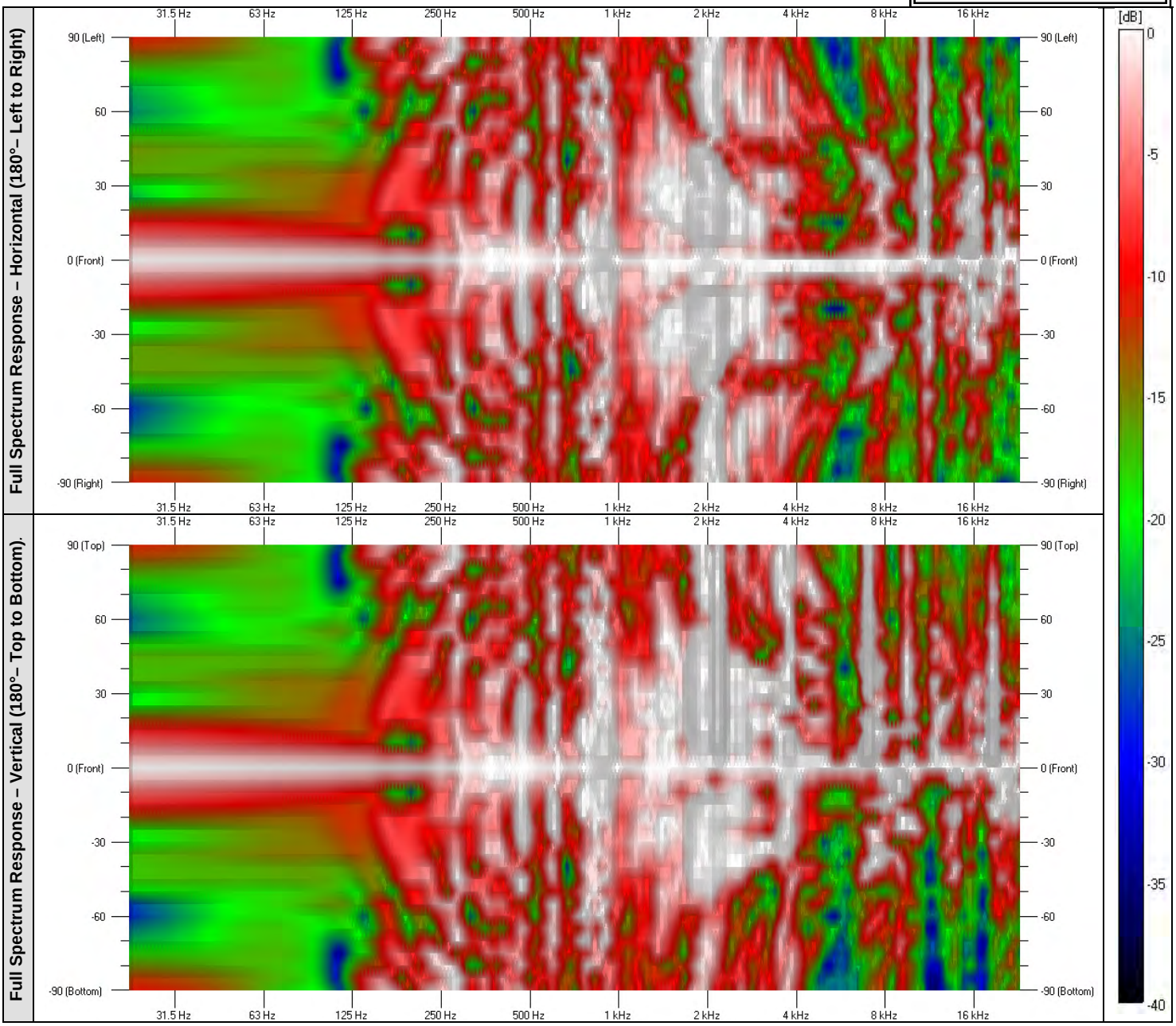
Depth: 4.5"

Mounting: Direct mount to wall/ceiling
– OR – Fit into standard T-bar grids.

Modified 2D Quadratic Diffuser
Binary Array / Angled Cap Design

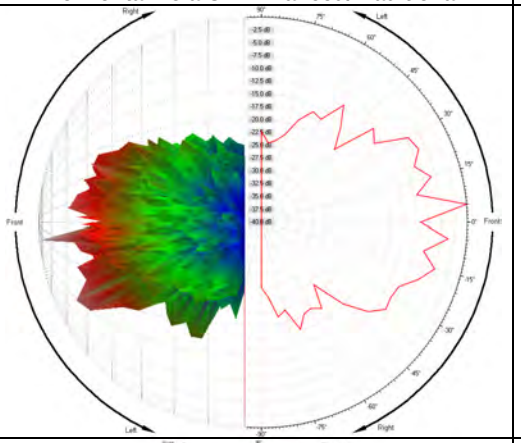
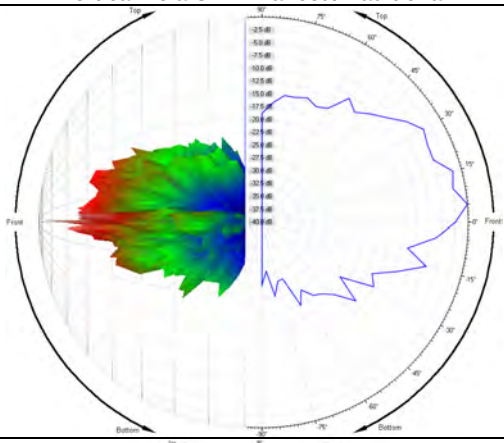
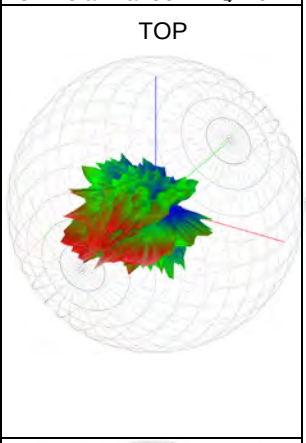
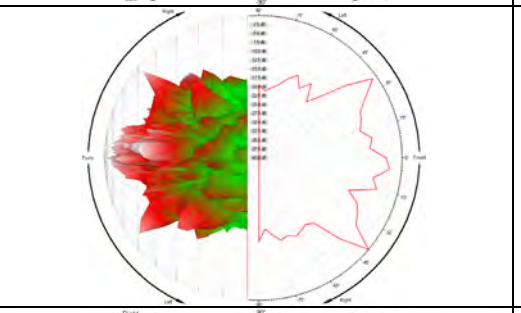
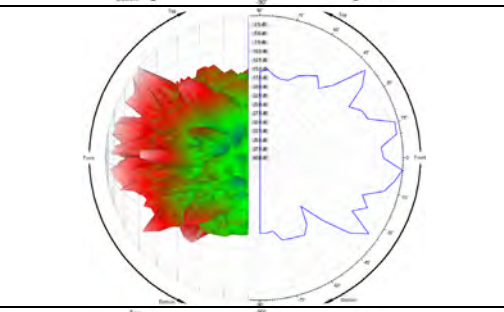
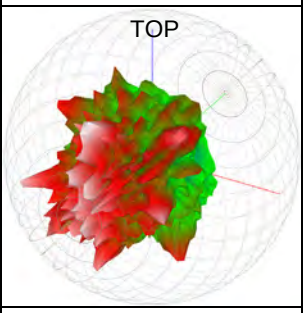
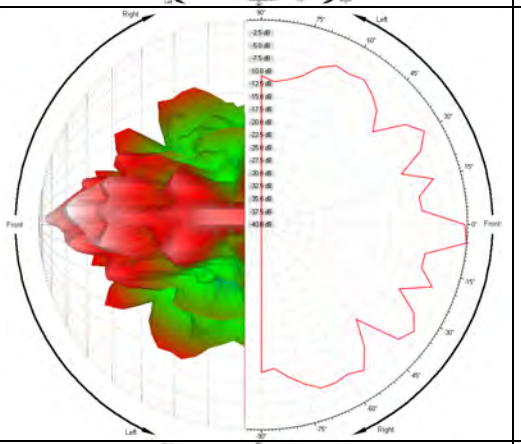
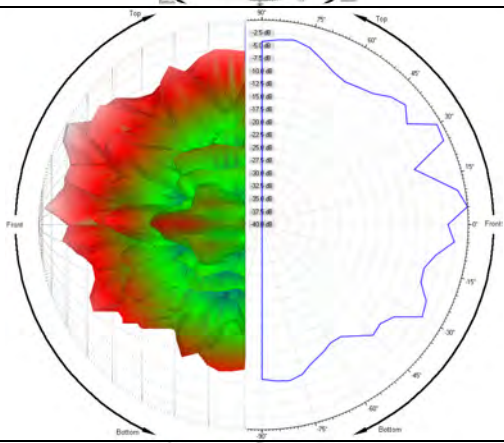
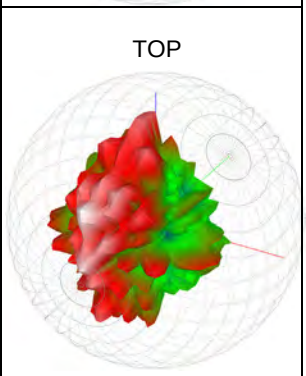
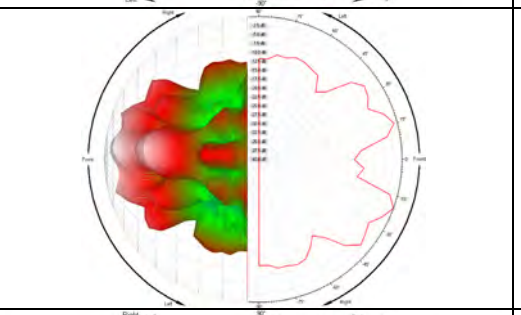
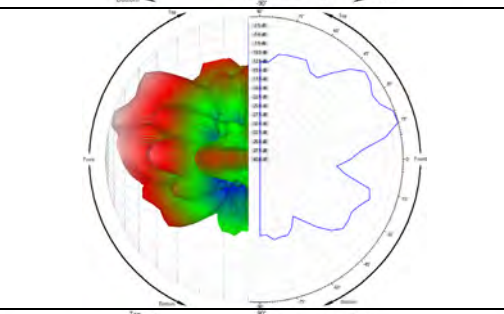
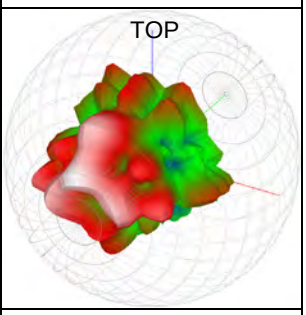
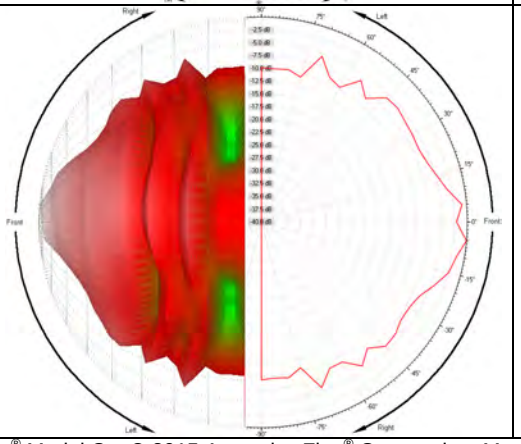
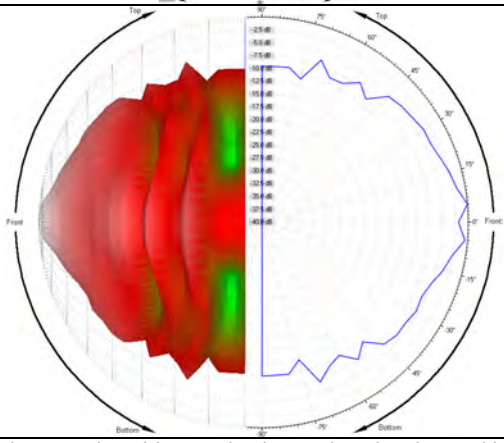
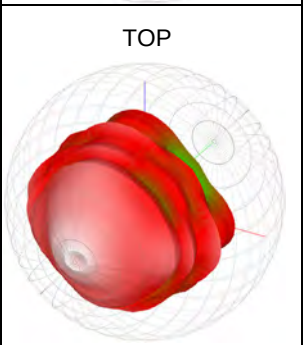
Operational Parameters:
Diffusion: Mid to High band
Primary: 1K- 4k (extended to 16+K)
Hemispheric Pattern (2D)
Some Low Frequency Absorption
Moderate Phase Grating & Scattering

Ceiling or Wall Mountable



Sound Absorption Coefficients – Art Diffusor® – Model C Performance							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
Type A	0.32	0.20	0.10	0.29	0.20	0.16	0.20
E400	0.20	0.12	0.12	0.31	0.23	0.22	0.20

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Model D

Art Diffusor® Model D Diffusor

A patented, two dimensional, organic quadratic diffuser; this diffuser provides an asymmetric diffusion pattern to help you tune your acoustic space. A combination of QRD, Bicubic Interpolation, MLS and Boolean systems went into the unique organic curvature, and wide frequency control of this design.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Size: 2'x2'

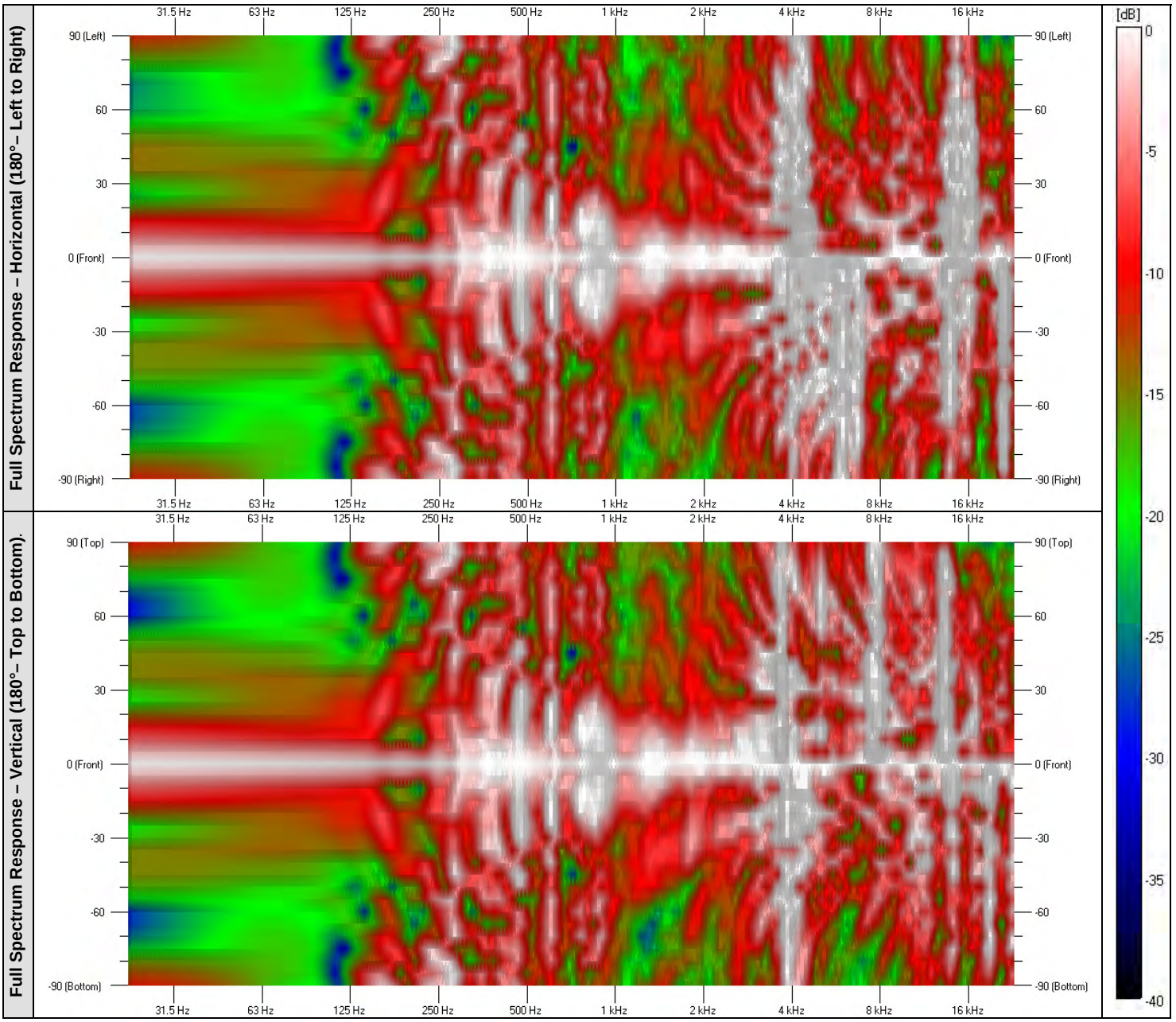
Depth: 4.1"

Mounting: Direct mount to wall/ceiling
– OR – Fit into standard T-bar grids.

Organic 2D Quadratic Diffuser
Proprietary Asymmetric Diffusion

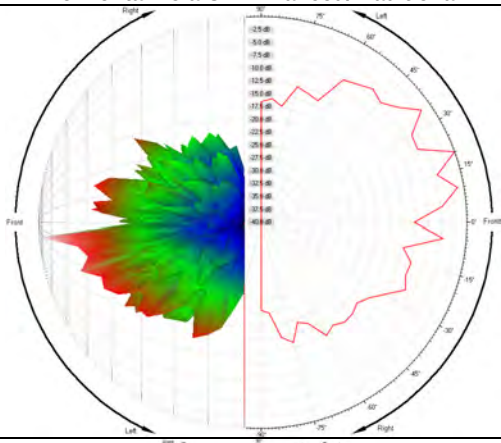
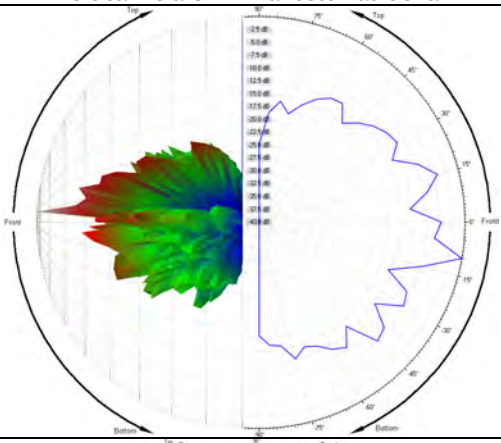
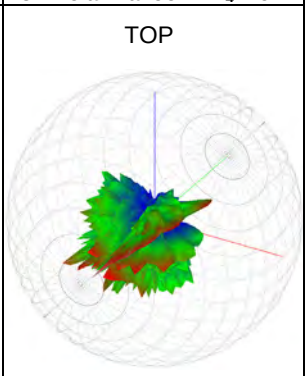
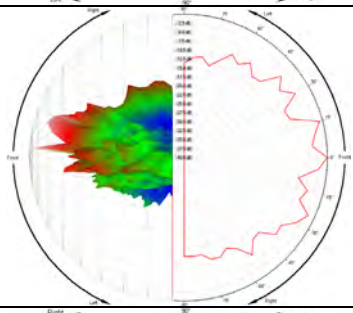
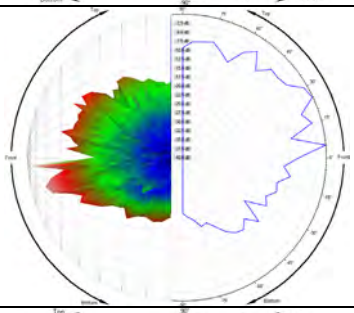
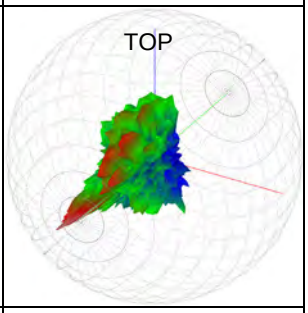
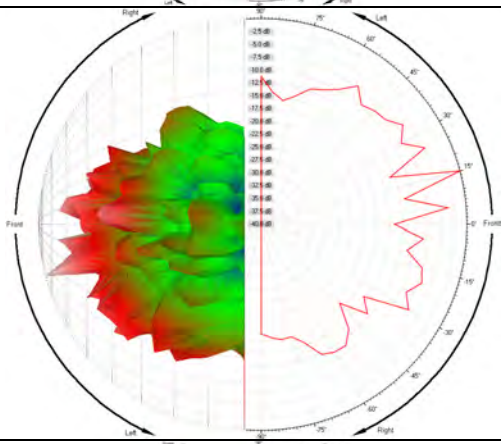
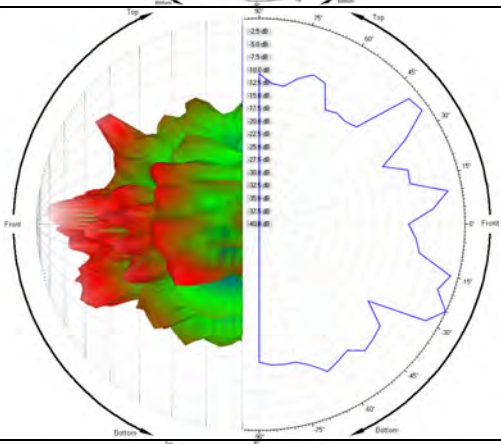
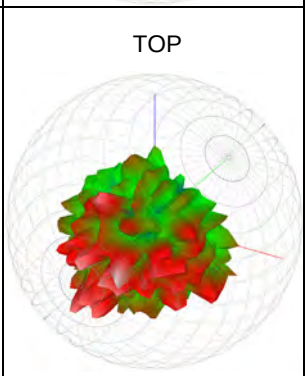
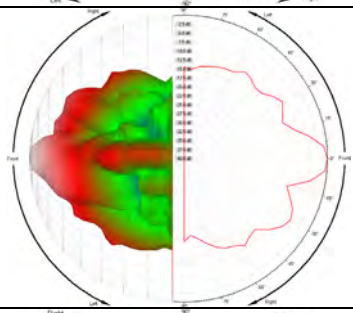
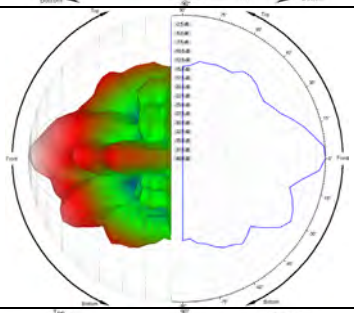
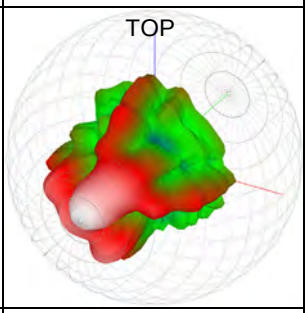
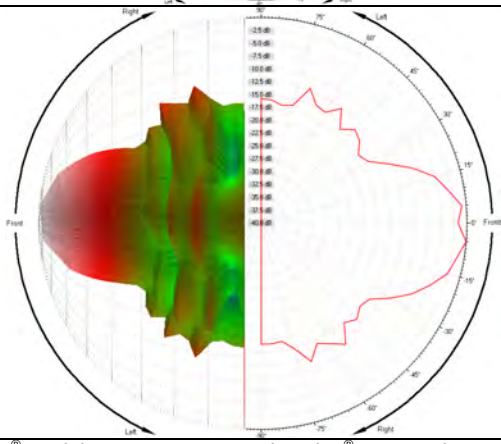
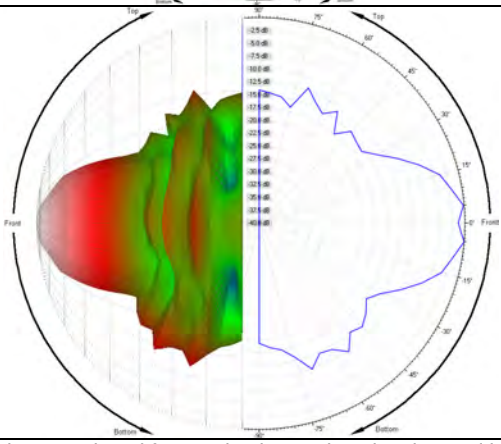
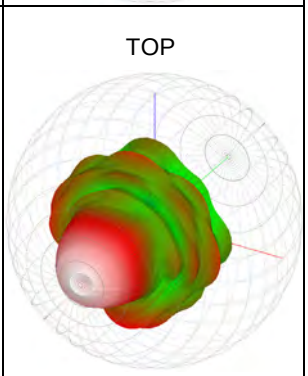
Operational Parameters:
Diffusion: Mid to High band
Primary: 1KHz- 20KHz
Wideband Asymmetric Diffusion (2D)
Low Frequency Absorption & Scatter
Intense Phase Diffusion & Scatter

Ceiling or Wall Mountable



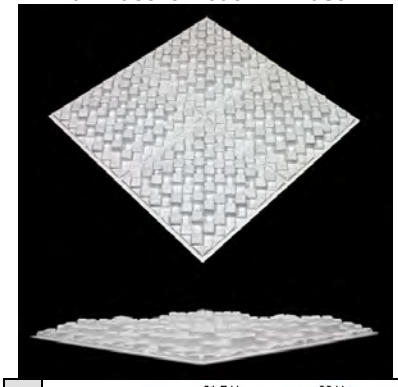
Sound Absorption Coefficients - Art Diffusor® – Model D Performance							
Test	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
Type A	0.23	0.08	0.05	0.19	0.20	0.11	0.15
E400	0.34	0.14	0.06	0.14	0.14	0.06	0.10

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Model F

Art Diffusor® Model F Diffusor



A patented, two dimensional, quadratic, binary array diffuser. This diffuser improves sound clarity through the control of distracting, high-frequency, flutter echoes. The range of the Model F is extended over other designs by its unique angled end caps to further control specular reflections above 8 kHz.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Size: 2'x2'

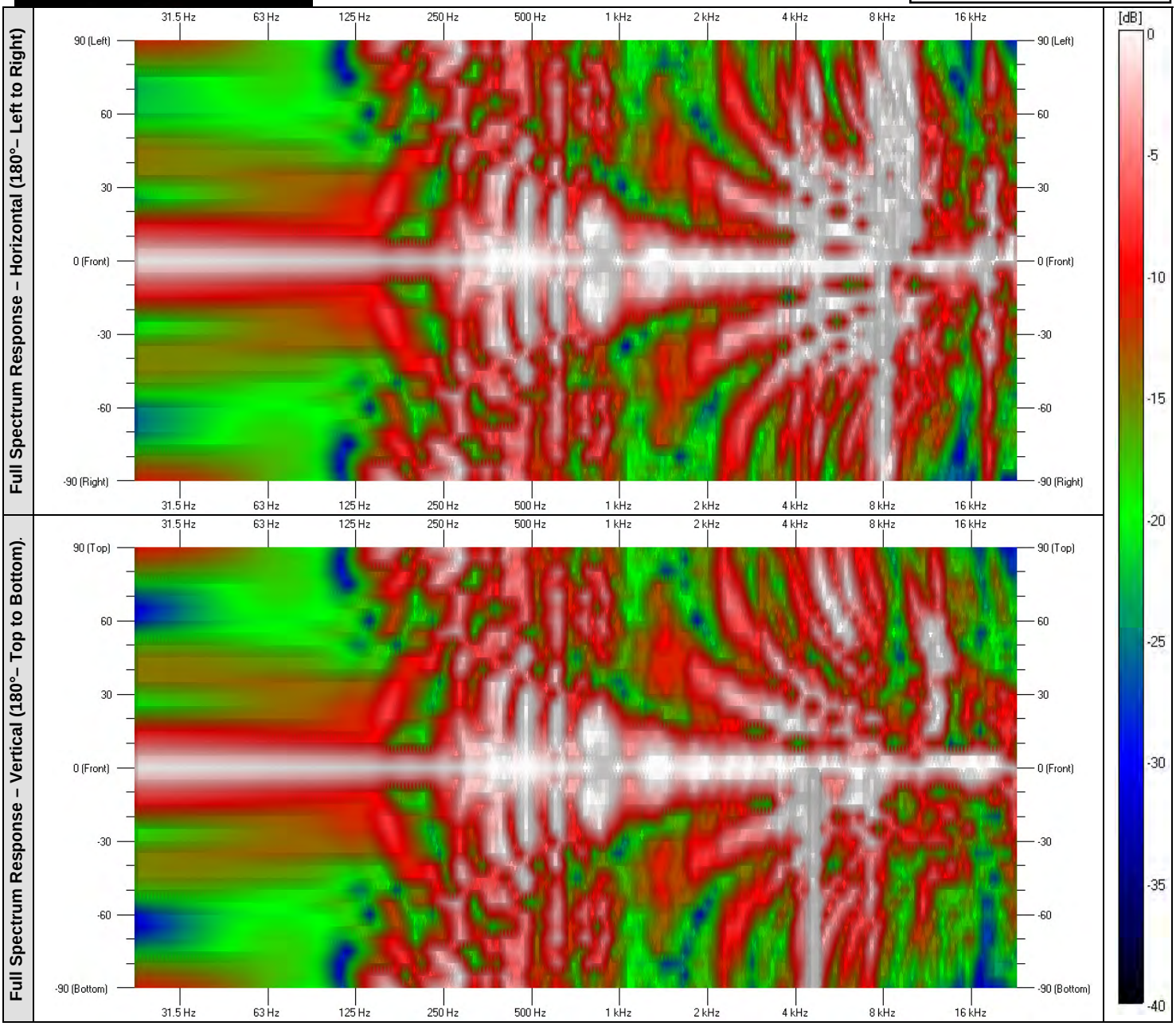
Depth: 2"

Mounting: Direct mount to wall/ceiling
– OR – Fit into standard T-bar grids.

Modified 2D Quadratic Diffuser
Binary Array / Angled Cap Design

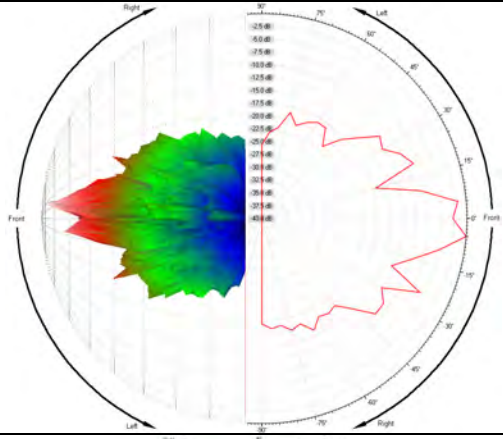
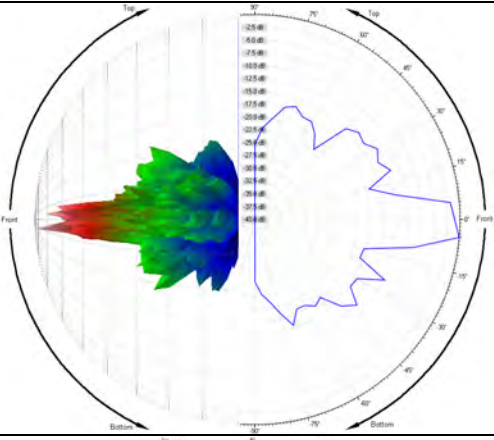
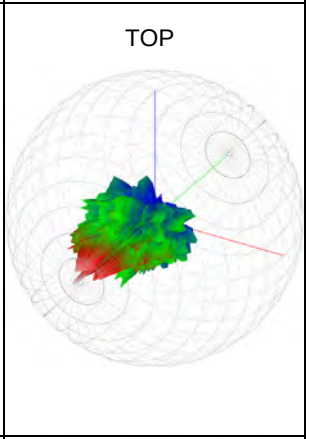
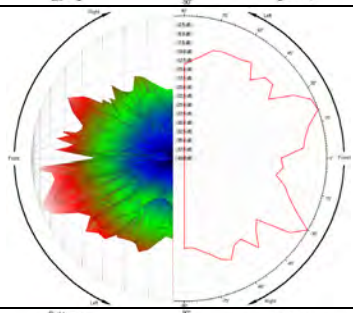
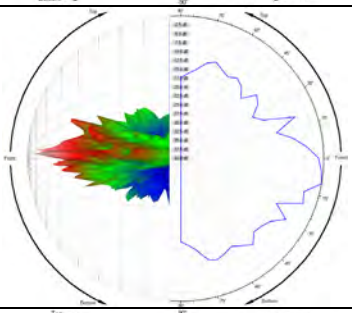
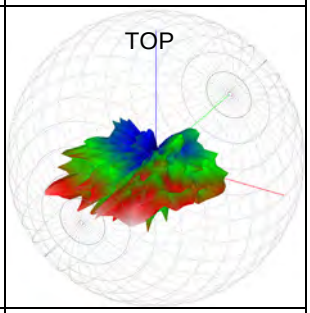
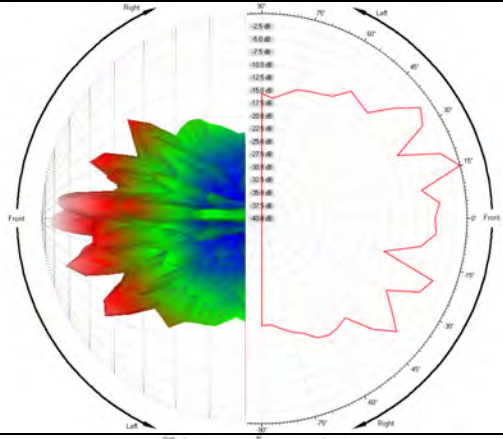
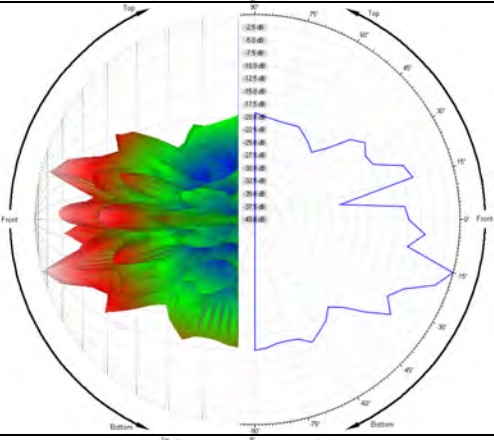
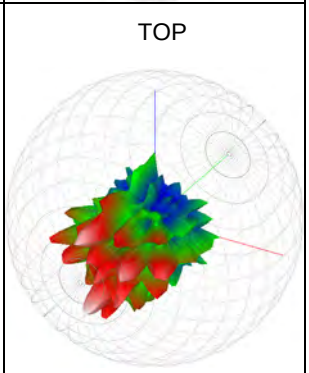
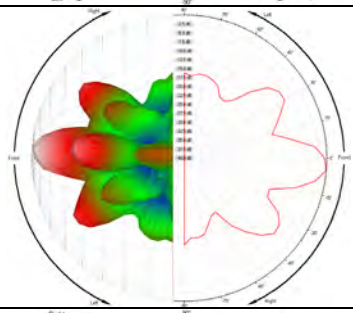
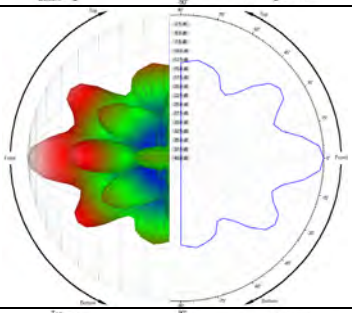
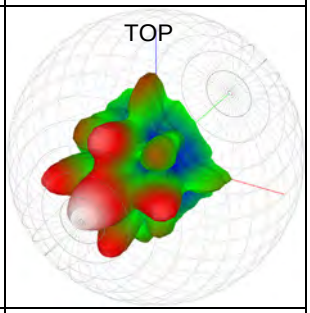
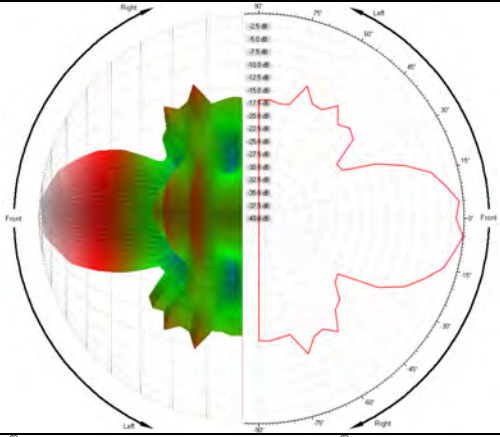
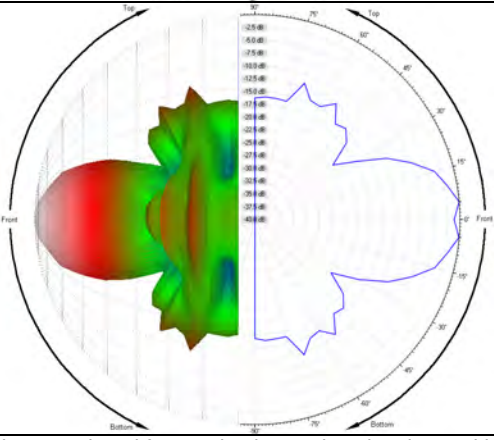
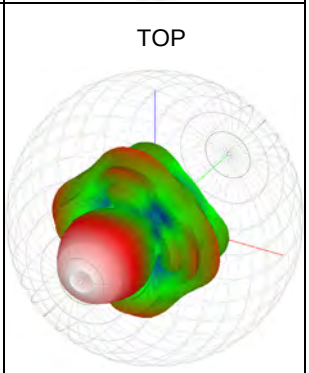
Operational Parameters:
Diffusion: Upper Mid to High band
Primary: 2K- 8k (extended to 16+K)
Hemispheric Pattern (2D)
Some Low Frequency Absorption
Moderate Phase Grating & Scattering

Ceiling or Wall Mountable



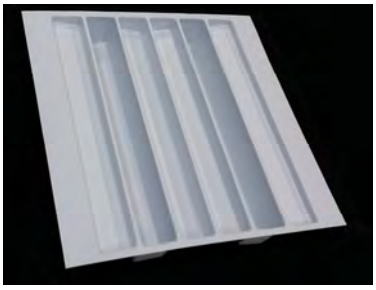
Sound Absorption Coefficients – Art Diffusor® – Model F Performance							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
Type A	0.05	0.60	0.07	0.09	0.07	0.13	0.20
E400	0.20	0.10	0.06	0.05	0.06	0.14	0.05

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Model Q

Art Diffusor® Model Q Diffusor



A one-dimensional, quadratic, well diffuser. This diffuser improves sound by incorporating quadratic residue number sequences to provide uniform broadband scattering. The range of the Model Q is extended over other designs by its unique angled well bottoms to further control specular reflections.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Size: 2'x2'

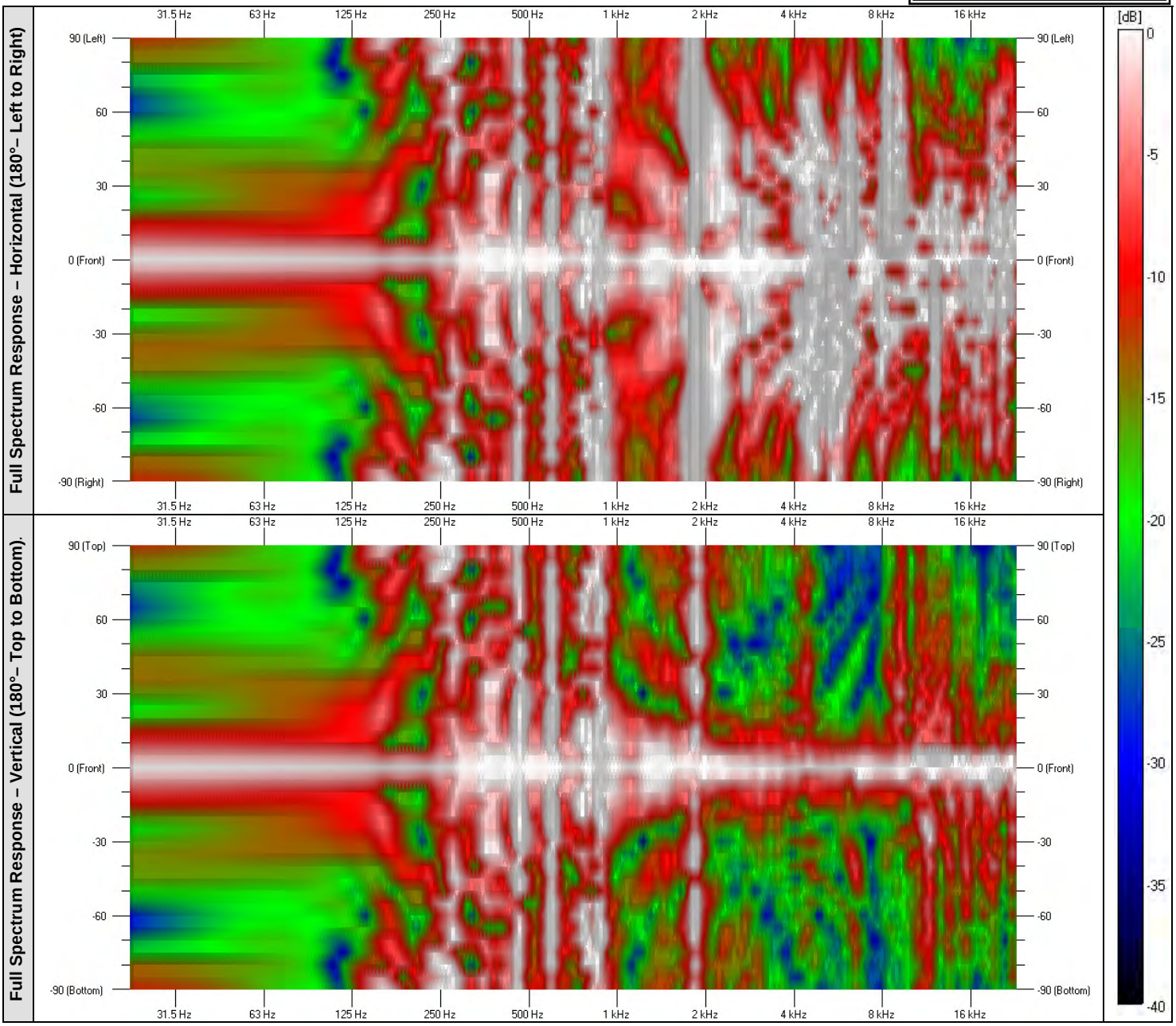
Depth: 4" (Nominal)

Mounting: Fit into standard T-bar grids.
– OR – Recessed mount to wall/ceiling

Modified 1D Quadratic Diffuser
Prime 7 / Angled Well Design

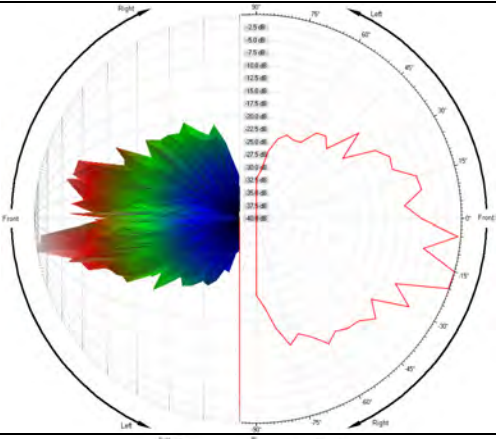
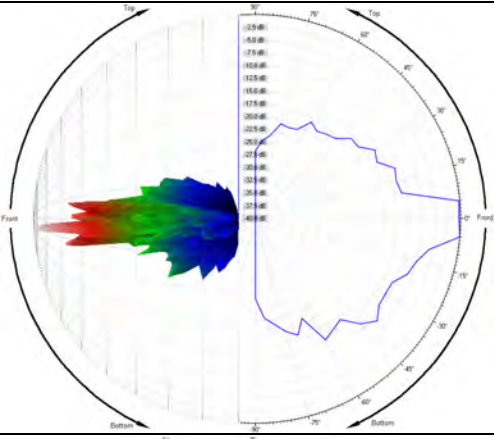
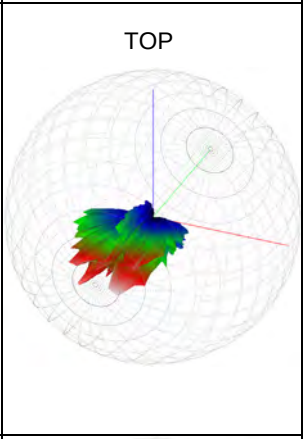
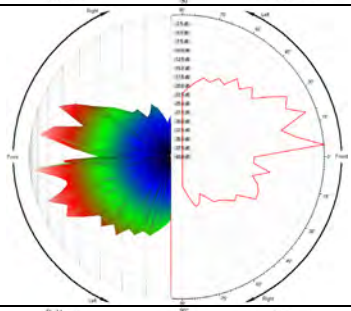
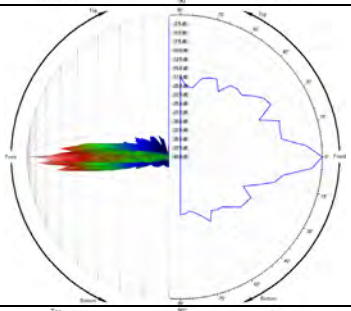
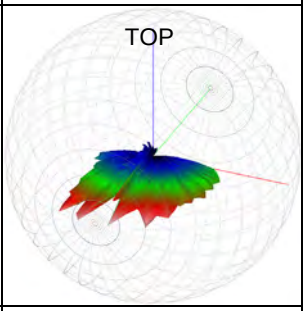
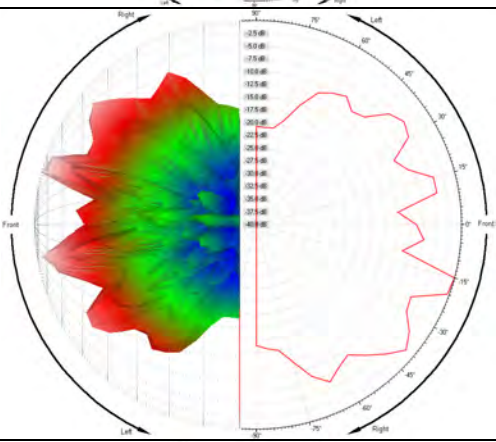
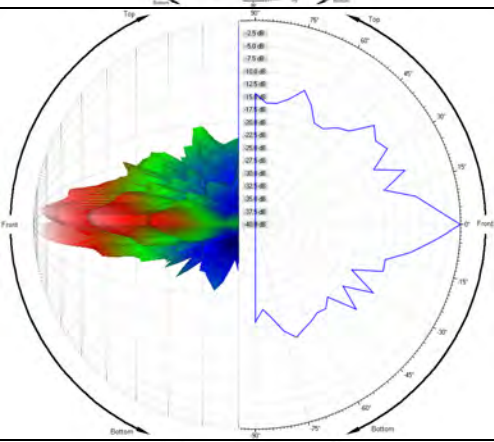
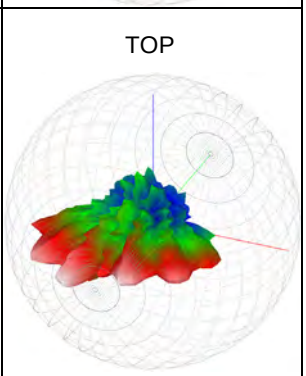
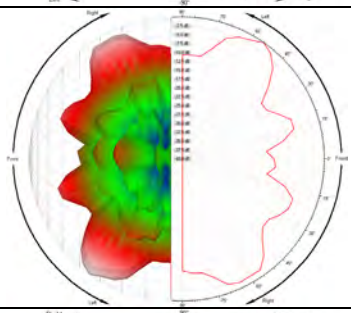
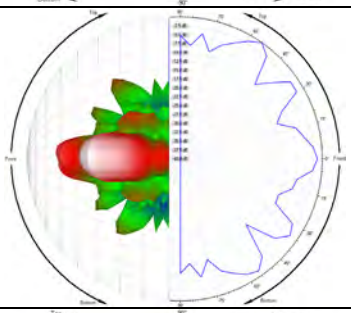
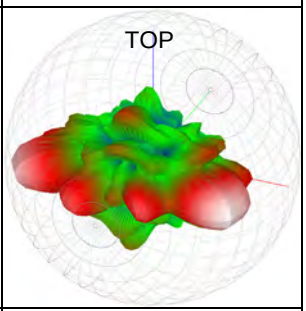
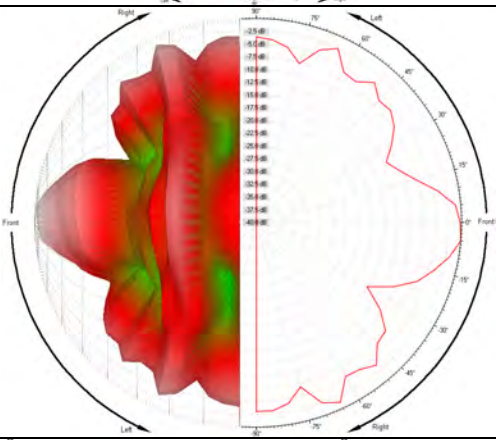
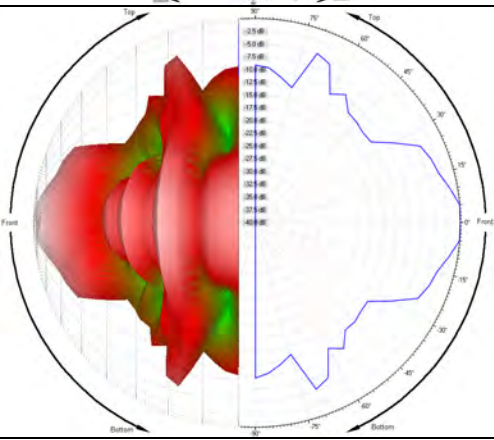
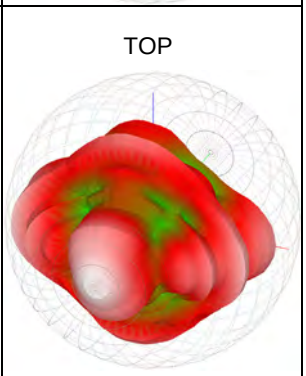
Operational Parameters:
Diffusion: Mid to Upper Mid band
Primary: Below 1K- 4k (ext. 16+K)
180° Scatter Pattern (1D)
Some Low Frequency Absorption
Moderate Phase Grating & Scattering

Ceiling Grid or Recessed Wall Mount



Sound Absorption Coefficients – Art Diffusor® – Model Q Performance							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
E400	0.35	0.40	0.45	0.30	0.14	0.19	0.30
E400 ^{W}/Insulation	0.38	0.39	0.45	0.31	0.13	0.16	0.30

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Trim – Type A

(Note: Test data from a 2'x2'section.)

Art Diffusor® Trim – Type A

A high-frequency, low-profile, quadratic diffuser. It improves sound using quadratic residue number sequences to provide uniform scattering. The range of the Trim is extended over other designs by its unique angled well bottoms to further control specular reflections.

Construction: Unfinished Maple.(Other woods and finishes available)

Nominal Size: 4" x 48" individual (2'x2' section tested)

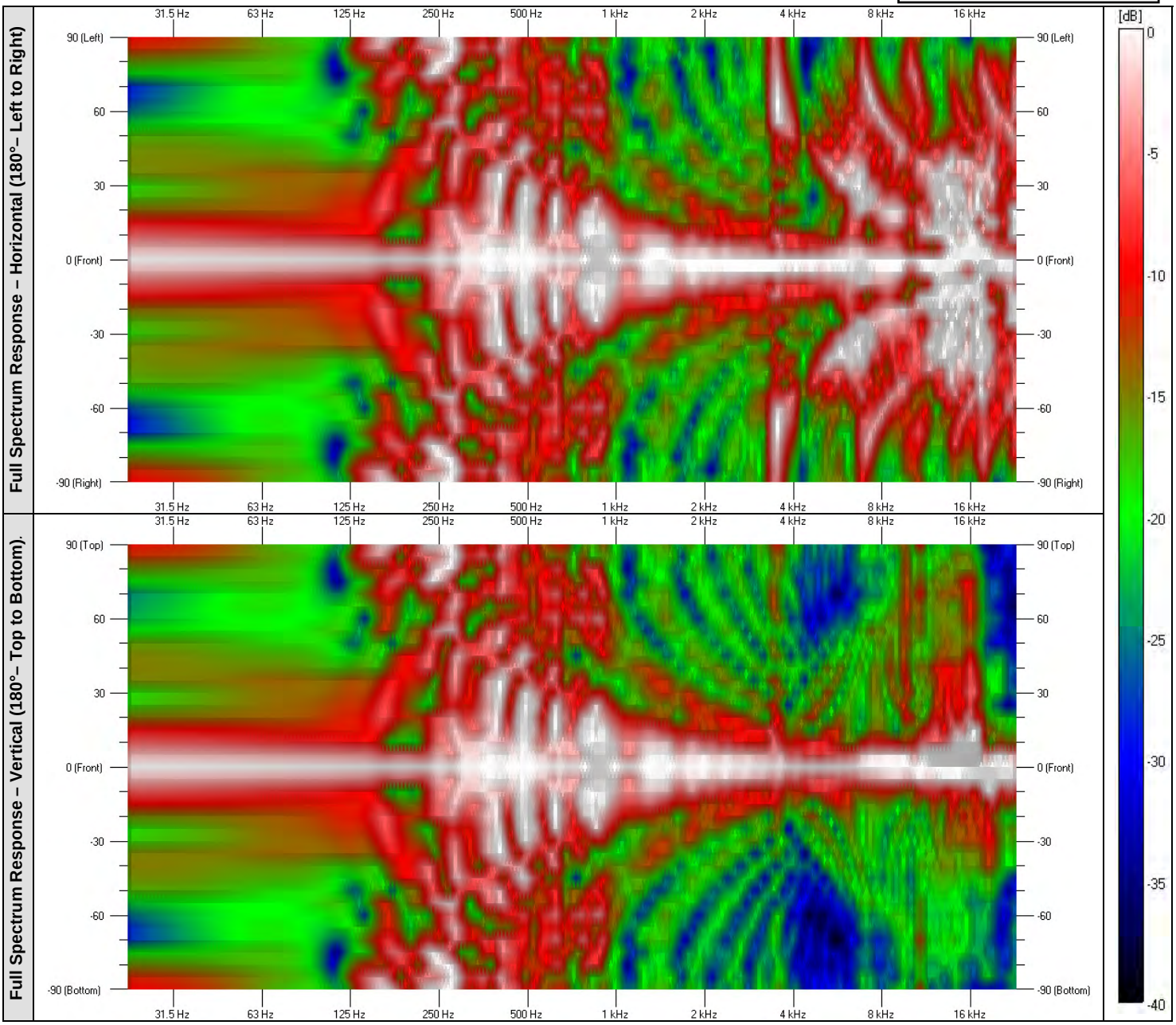
Thickness: 1.125" (Nominal)

Mounting: Direct mount to wall/ceiling.

Modified 1D Quadratic Diffuser
Prime 7 / Angled Well Design

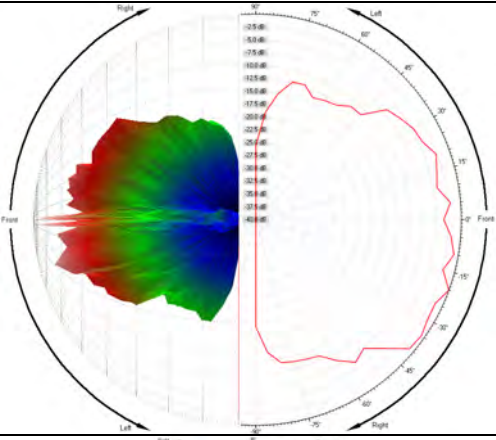
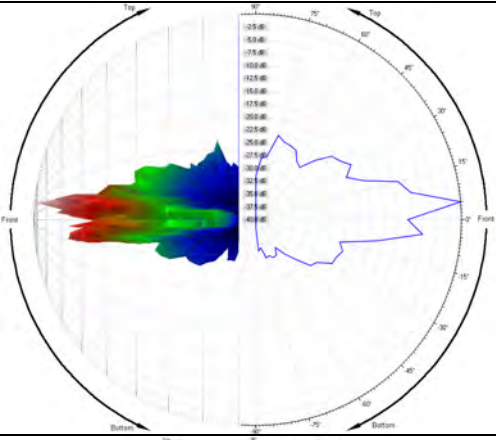
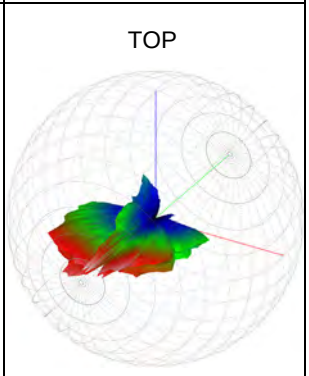
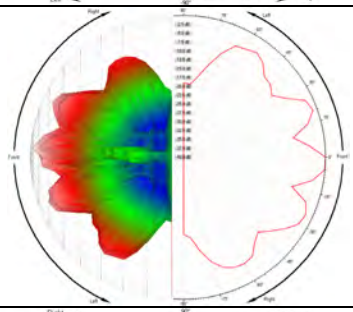
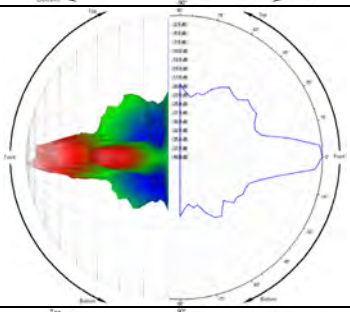
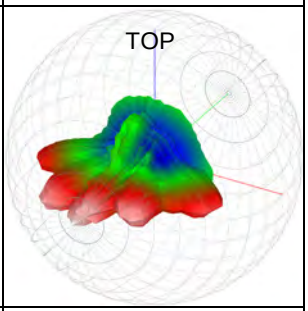
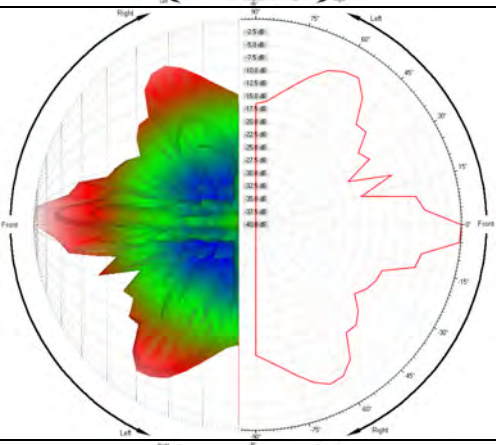
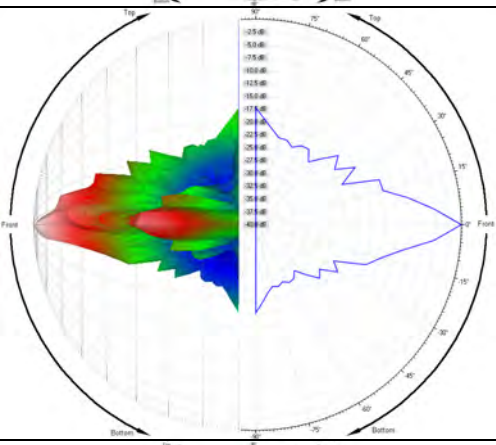
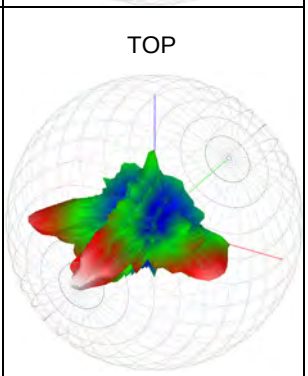
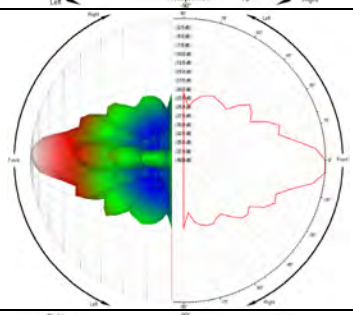
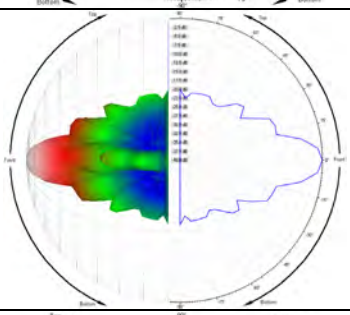
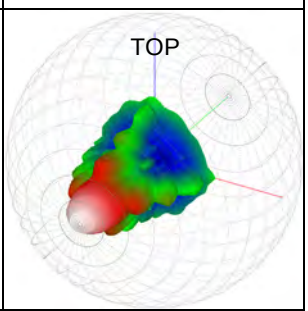
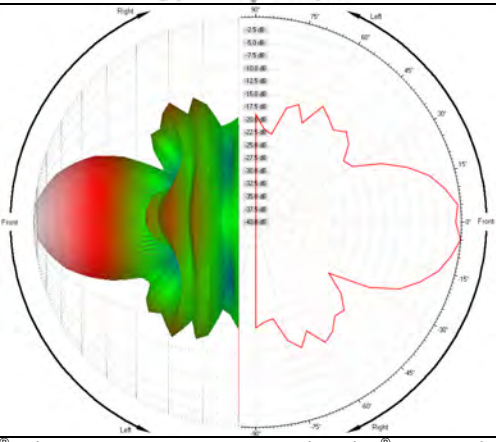
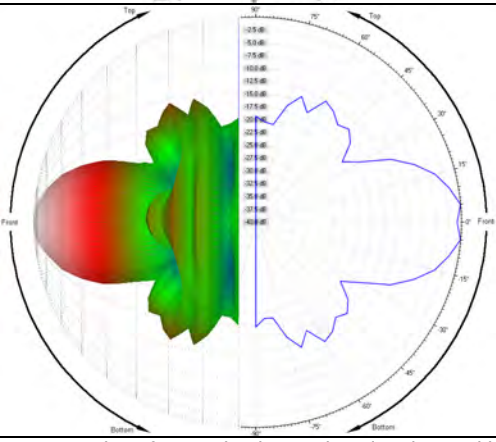
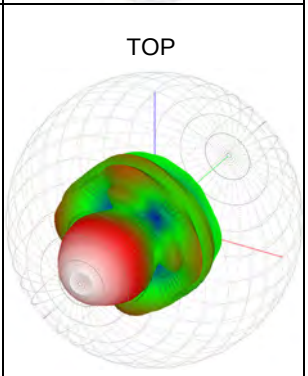
Operational Parameters:
Diffusion: Upper Mid - High band
Primary: 2KHz - 16+KHz
180° Scatter Pattern (1D)
Flutter Echo Control
Subtle Phase Grating & Scattering

Ceiling or Wall Mountable



Sound Absorption Coefficients – Art Diffusor® Trim – Type A Performance (Varies*)							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
-	*Sound Absorption for this product varies depending on many factors (wood species, finish, installation method, fastener type, length, etc.).						-
-	-	-	-	-	-	-	-

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Trim – Type B

(Note: Test data from a 2'x2'section.)

Art Diffusor® Trim – Type B

A high-frequency, low-profile, quadratic diffuser. It improves sound using quadratic residue number sequences to provide uniform scattering. The range of the Trim is extended over other designs by its unique organic curve interpolation to further control specular reflections.

Construction: Unfinished Maple.(Other woods and finishes available)

Nominal Size: 4" x 48" individual (2'x2' section tested)

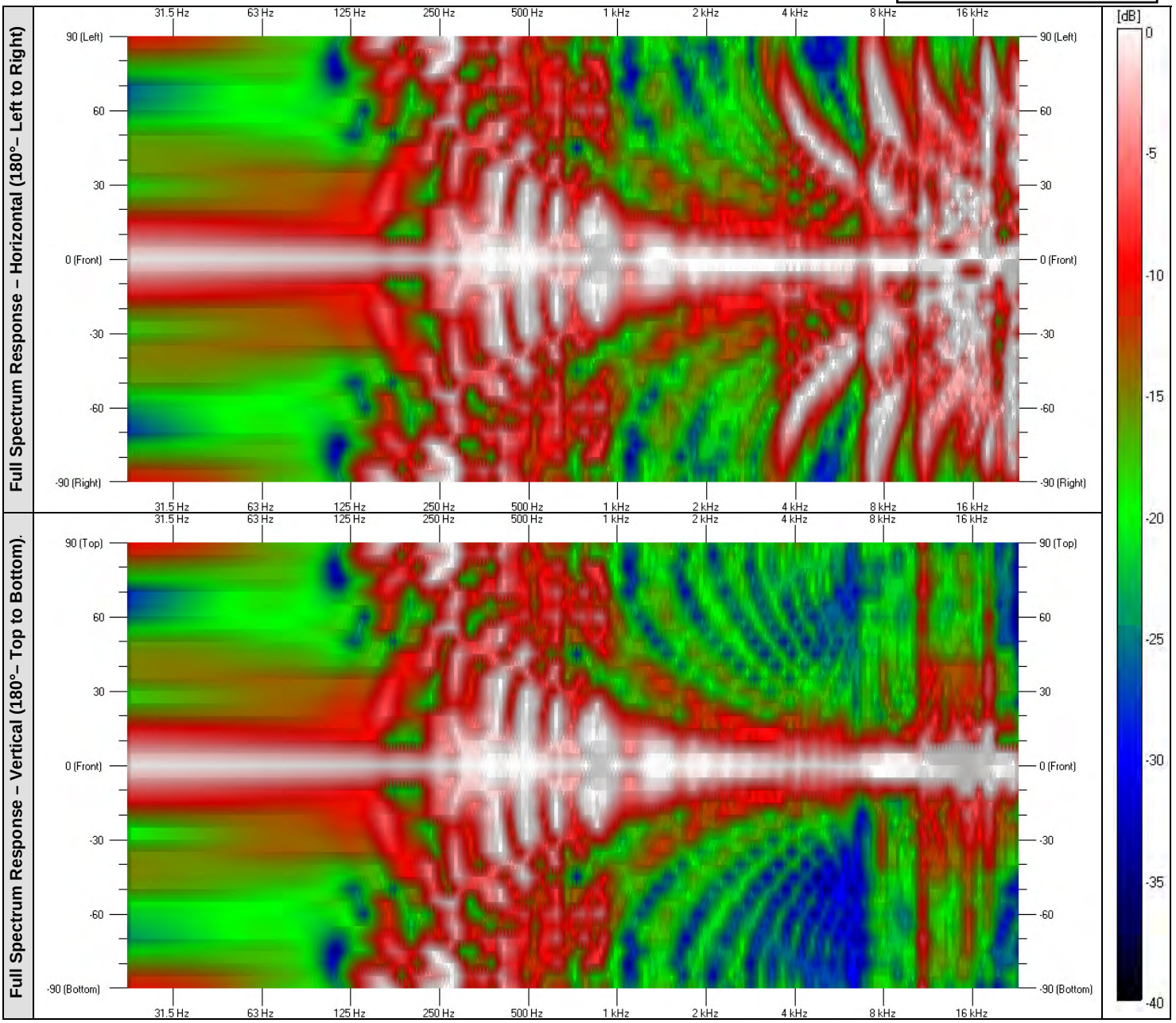
Thickness: 1.125" (Nominal)

Mounting: Direct mount to wall/ceiling.

Modified 1D Quadratic Diffuser
Prime 7 / Organic Spline Design

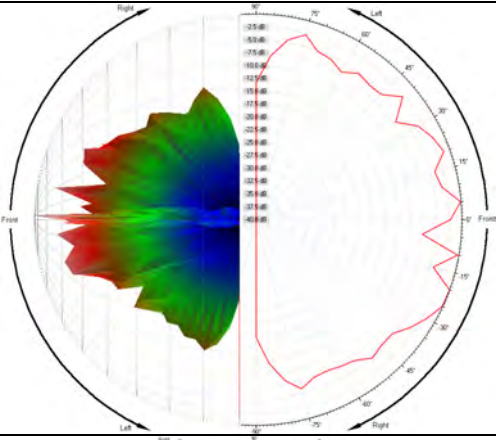
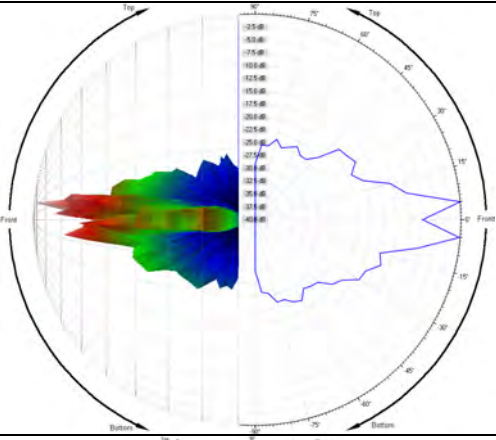
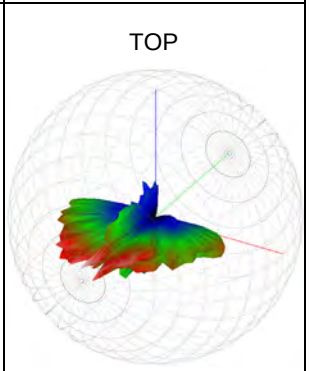
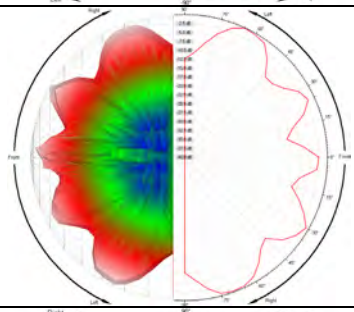
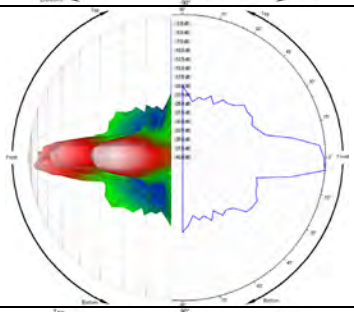
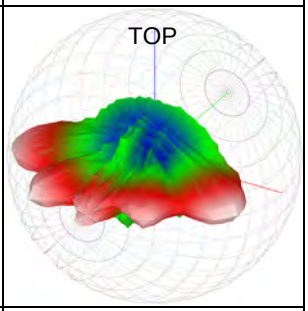
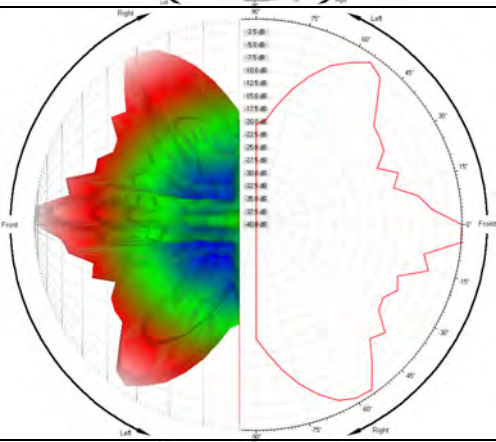
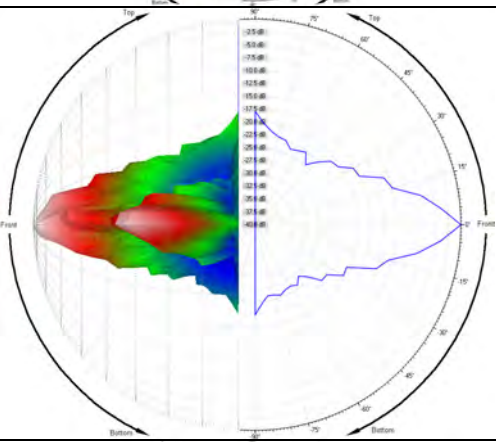
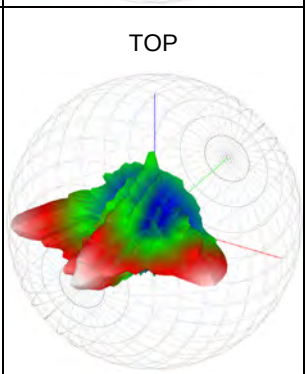
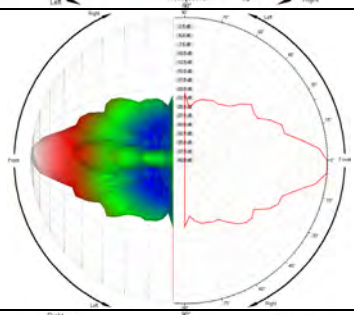
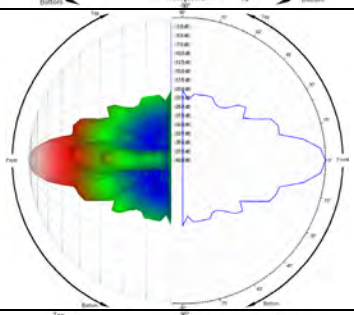
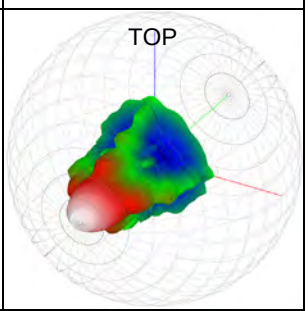
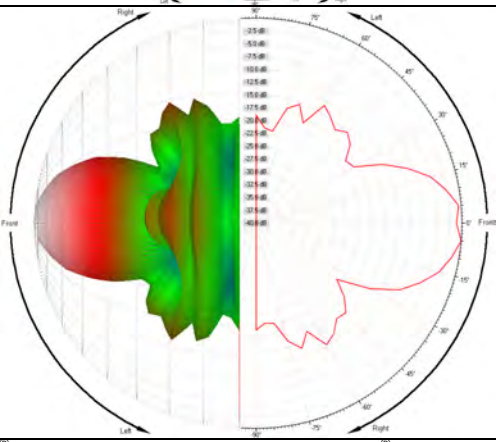
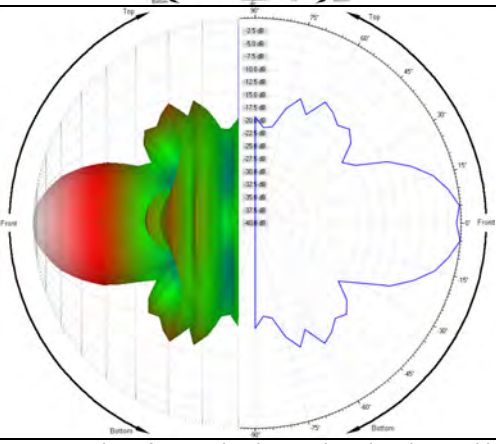
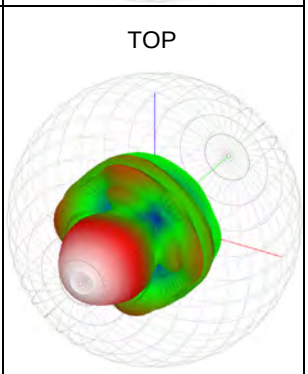
Operational Parameters:
Diffusion: Upper Mid - High band
Primary: 2KHz - 16+KHz
180° Scatter Pattern (1D)
Flutter Echo Control
Subtle Phase Grating & Scattering

Ceiling or Wall Mountable



Sound Absorption Coefficients – Art Diffusor® Trim – Type B Performance (Varies*)							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
-	*Sound Absorption for this product varies depending on many factors (wood species, finish, installation method, fastener type, length, etc.).						-
-	-	-	-	-	-	-	-

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Art Diffusor® Model W

Art Diffusor® Model W

A patented, binary array, quadratic diffuser. It improves sound using quadratic residue number sequences to provide uniform scattering. The range is extended using angled blocks, and further diffused through the alternating binary array configuration of the rows.

Construction: Poplar, Maple, Oak.(Other woods available)

Nominal Size: 15"x15" individual

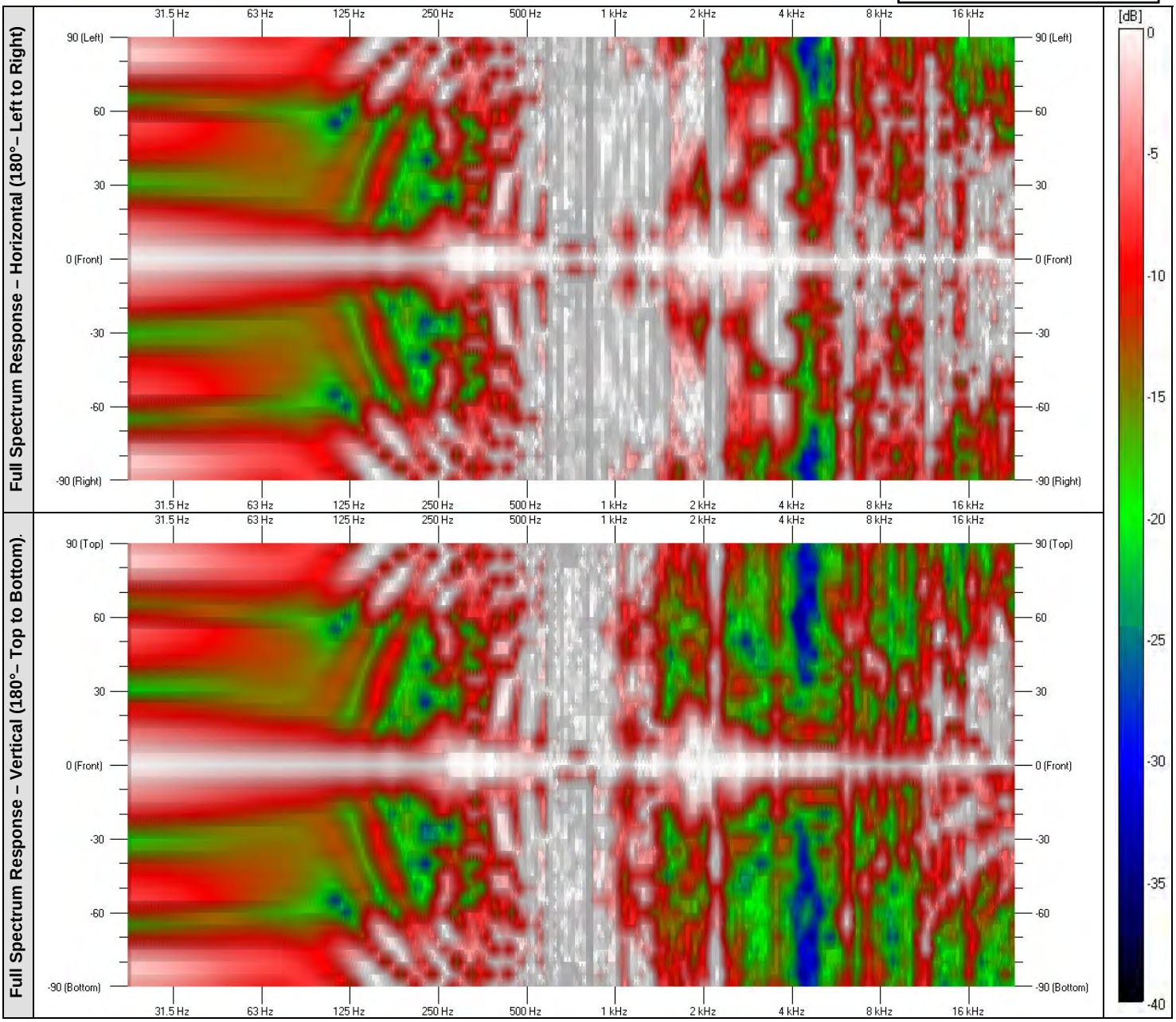
Thickness: 9.5" (Nominal)

Mounting: Direct mount to wall. Not recommended for ceiling.

Modified 1D Binary Array/Quadratic Angled Blocks, Alternating Rows

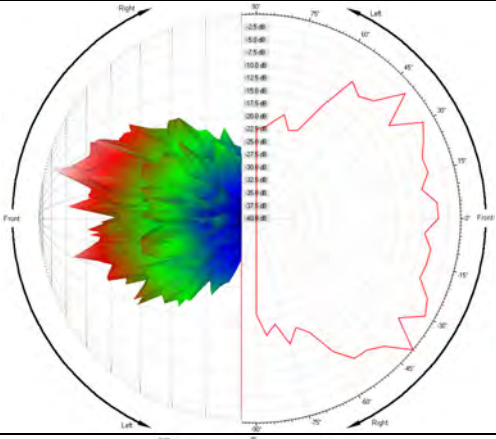
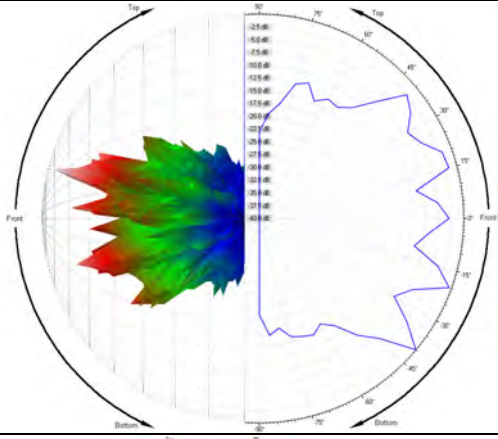
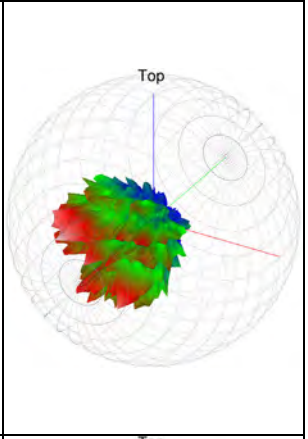
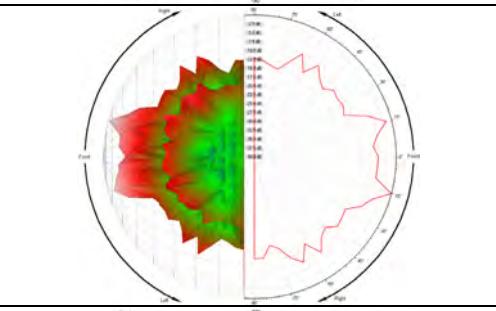
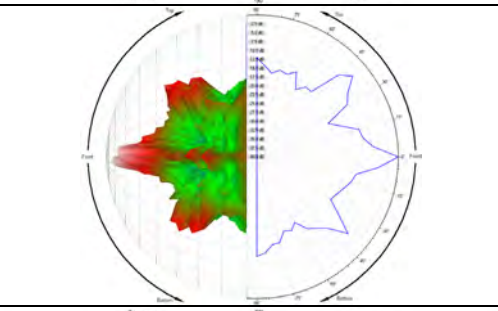
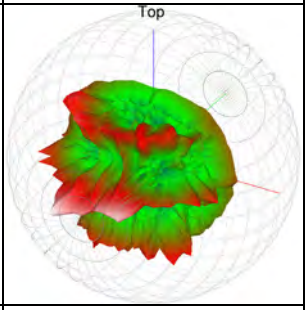
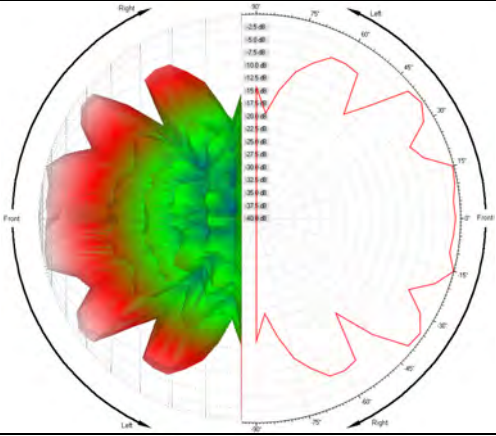
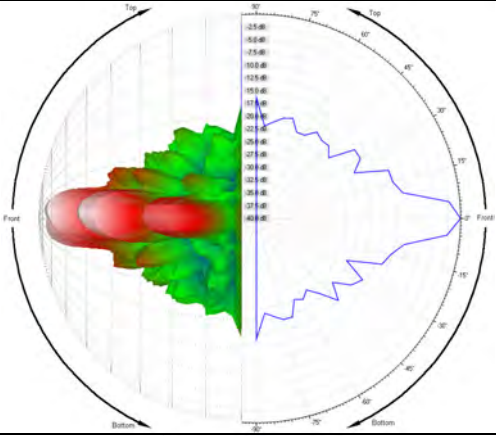
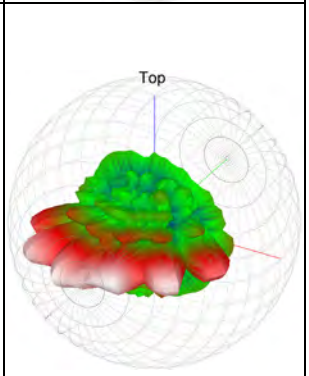
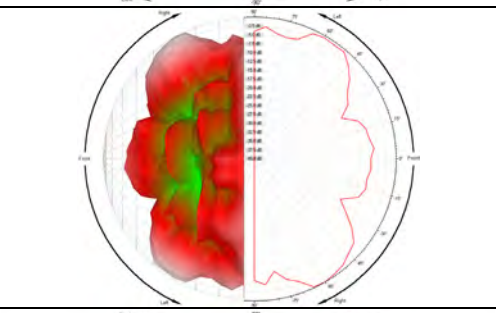
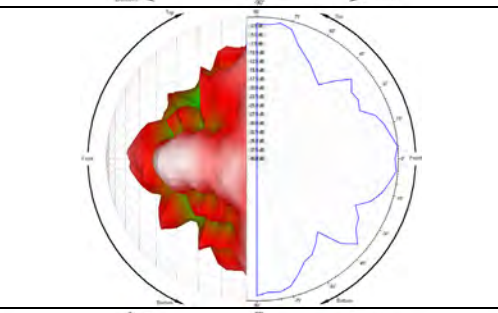
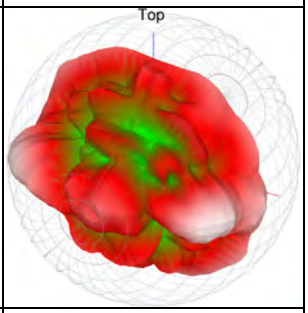
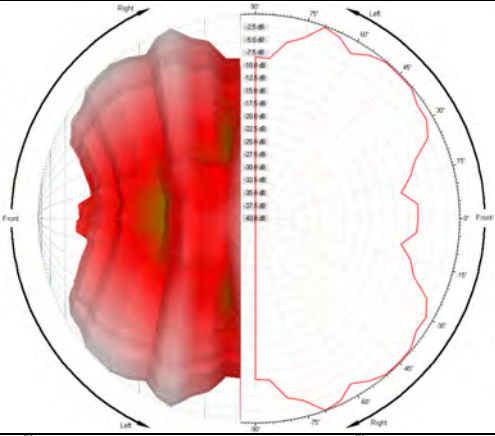
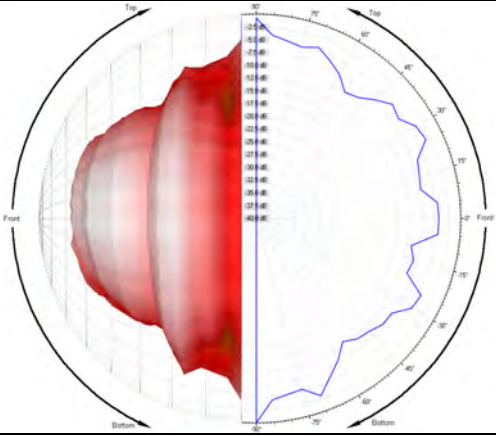
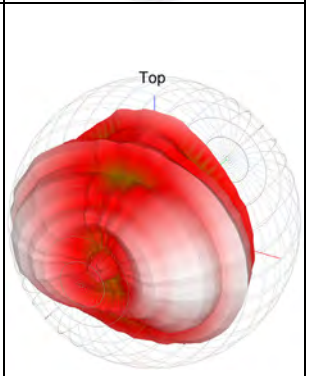
Operational Parameters:
Diffusion: Mid - High band
Primary: <1KHz - 16+KHz
1D Mid range – 2D Hemi High range
Flutter Echo Control
Moderate Phase Grating & Scattering

Wall Mountable (Heavy)



Sound Absorption Coefficients – Art Diffusor® Model W Performance (Varies*)							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
-	*Sound Absorption for this product varies depending on many factors (wood species, finish, installation method, fastener type, etc.).						-
-	-	-	-	-	-	-	-

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

QuadraPyramid™ Diffuser

QuadraPyramid™ Diffuser

A patented, low-profile, geometric array diffuser. This diffuser is a proprietary array of 4 low-profile, offset pyramids, each quadrant rotated 90°. This provides a wide frequency range with a smooth and predictable response – without sacrificing the space of a larger diffuser.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Size: 2'x2'

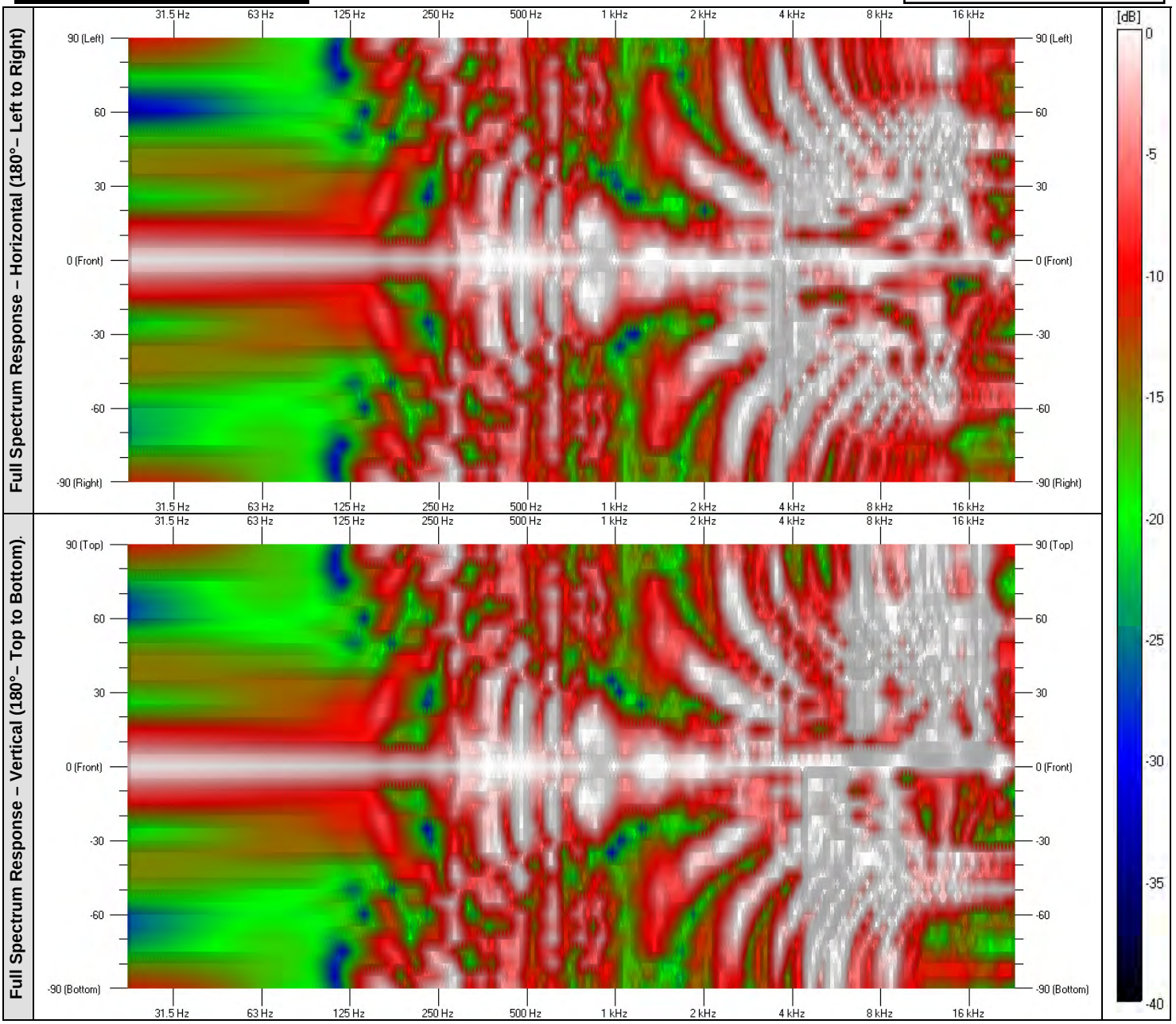
Depth: 2.75"

Mounting: Direct mount to wall/ceiling
– OR – Fit into standard T-bar grids.

Modified 2D Geometric Diffuser
Proprietary Offset Pyramid Array

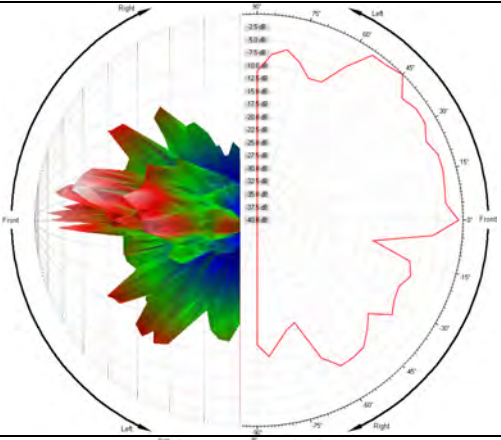
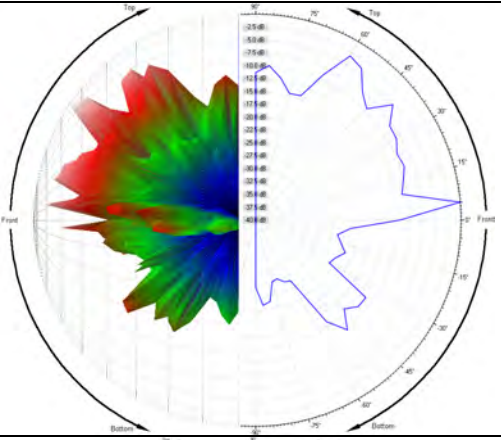
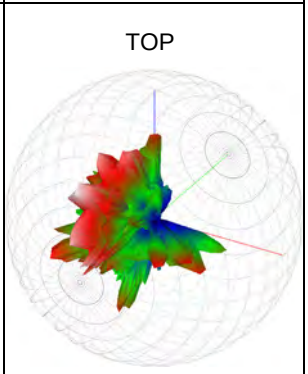
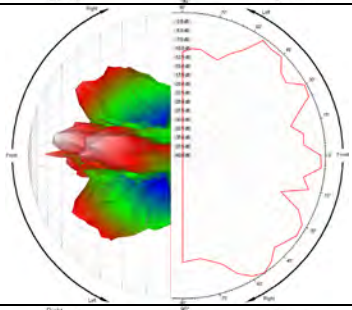
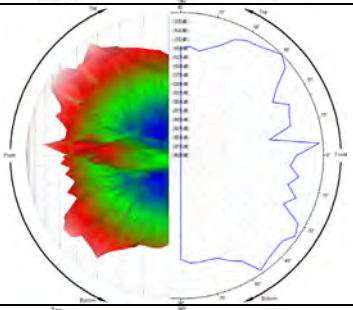
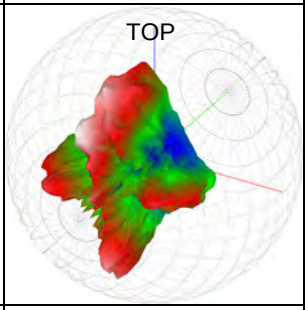
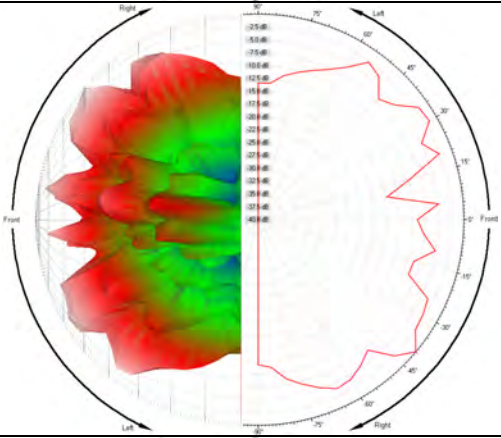
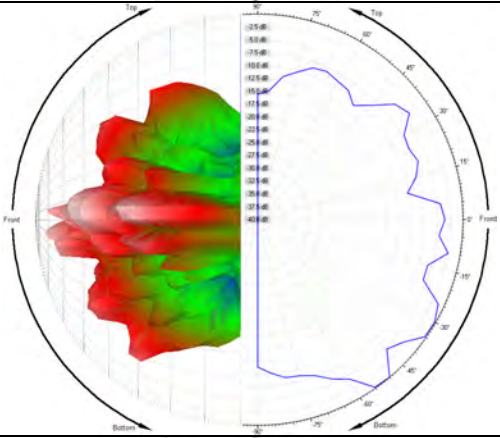
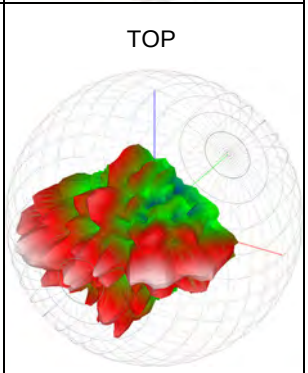
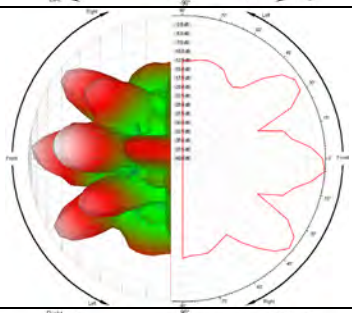
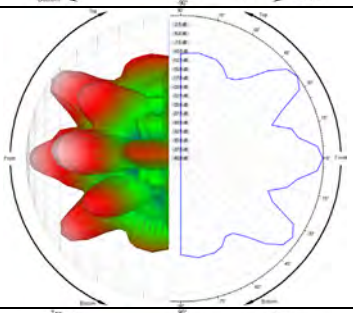
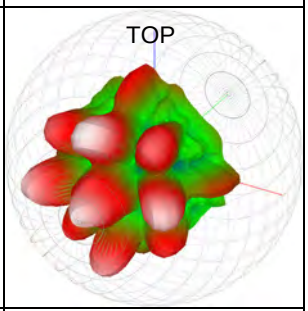
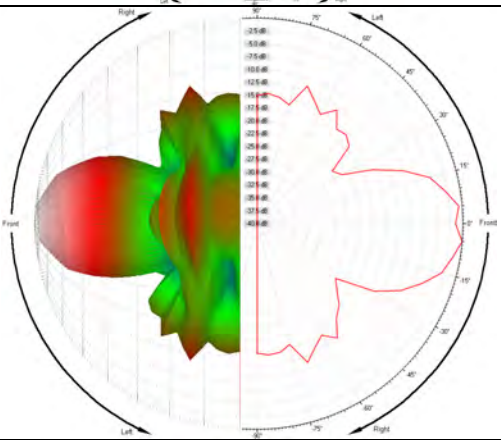
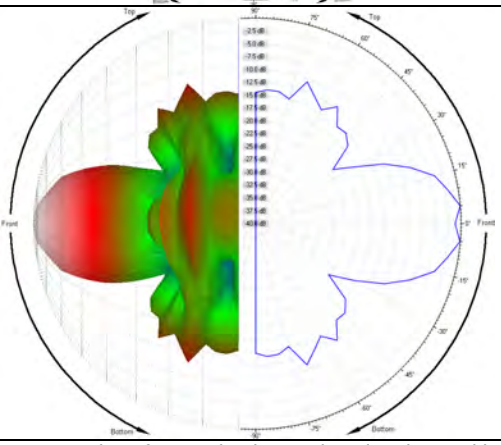
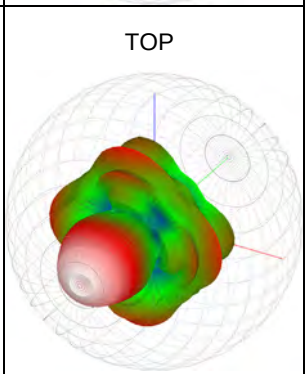
Operational Parameters:
Diffusion: Wide Mid - High band
Primary: 1.5KHz- 16+KHz
Asymmetric Scatter Pattern (2D)
Some Low Frequency Absorption
Moderate Phase Scattering

Ceiling or Wall Mountable



Sound Absorption Coefficients – QuadraPyramid™ Diffuser Performance							
Mounting	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**NRC**
Type A	0.23	0.58	0.05	0.04	0.04	0.11	0.20
E400	0.28	0.17	0.09	0.07	0.10	0.14	0.10

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Pyramidal Diffuser

(Note: Test data from a 2'x2' model.)

2'X2' Pyramidal Diffuser

Pyramidal diffusers quickly and easily eliminate floor to ceiling standing waves. They reduce flutter echo while maintaining a warm room sound. Molded in a one-piece pyramid shape, their offset apex provides four different angles of reflection.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Sizes: 2'x2', 2'x4', 4'x4'

Depth: 8" – 13" (nominal)

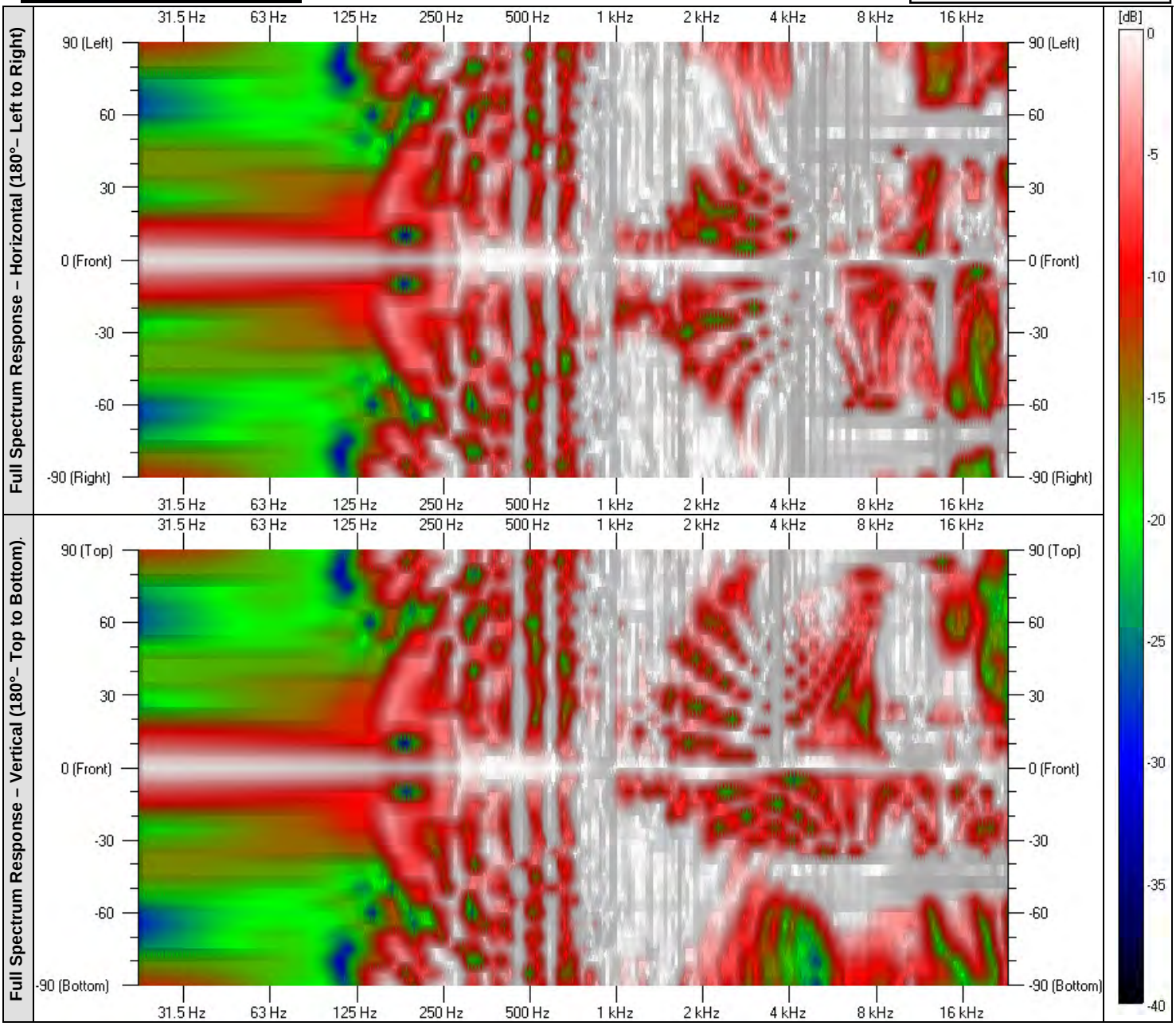
Mounting: L-Bracket for Direct mount to wall/ceiling
– OR – Manufactured to Fit into standard T-bar grids.

Internal cavity can be lined with a 1½" thick layer of glass fiber batting to increase absorption and prevent resonance.

Modified 2D Geometric Diffuser
Asymmetric Offset Pyramid

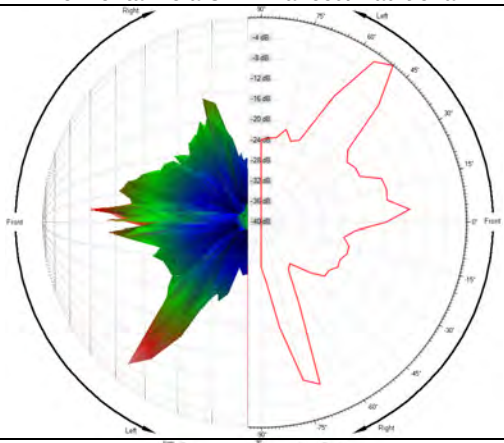
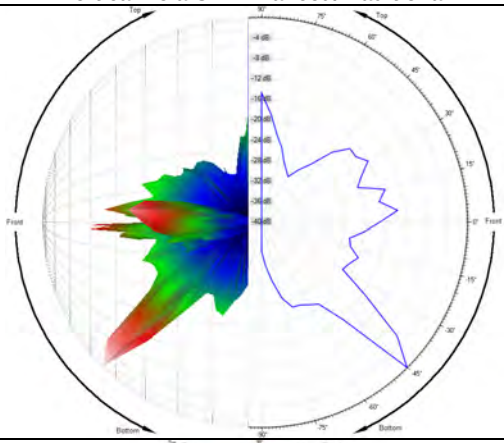
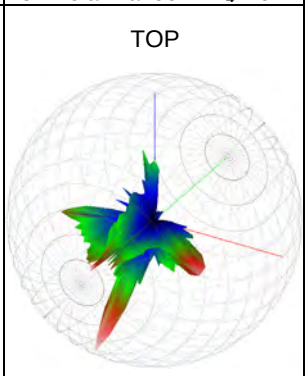
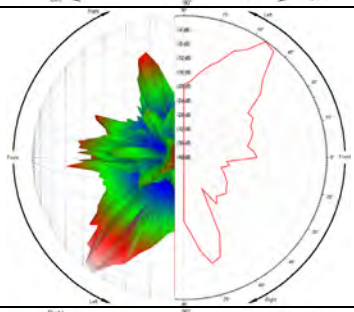
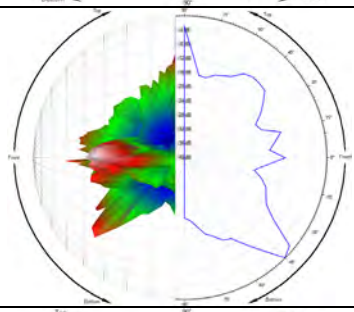
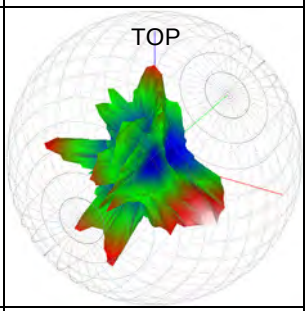
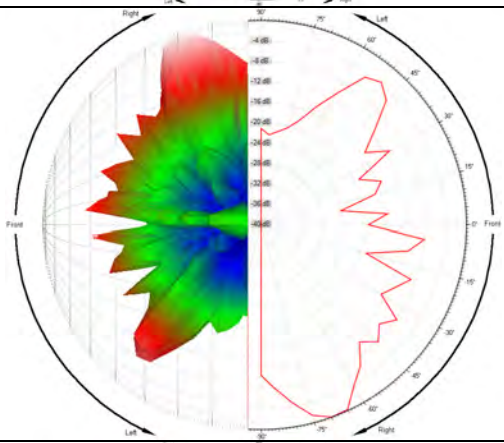
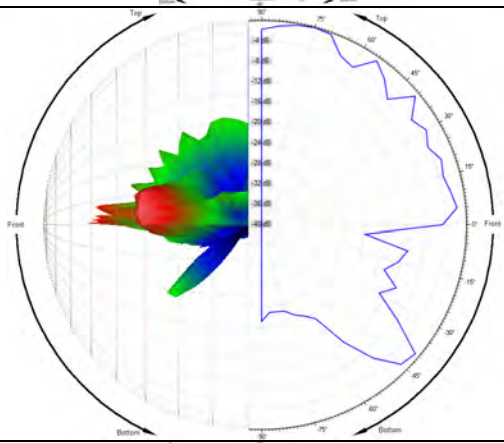
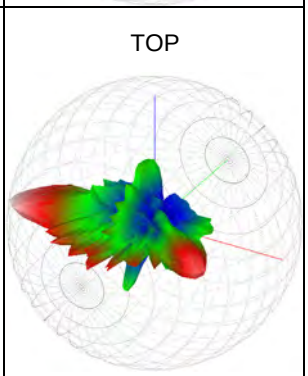
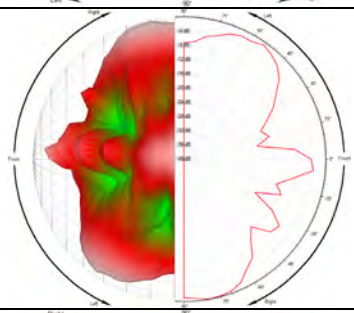
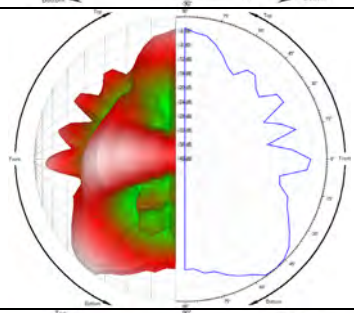
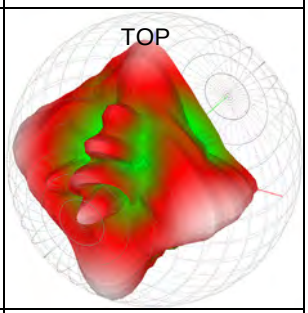
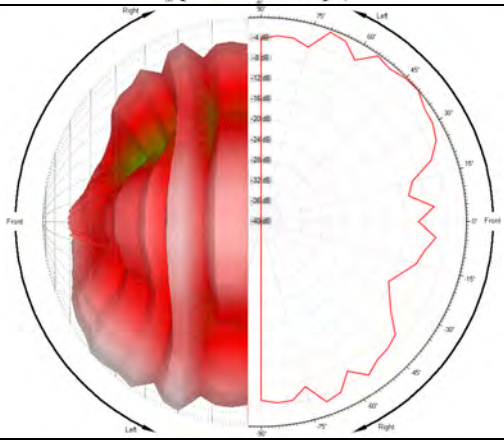
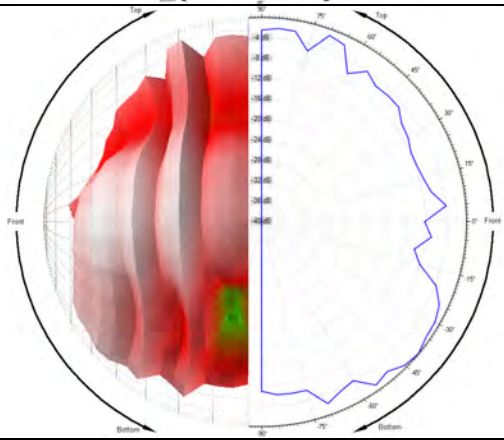
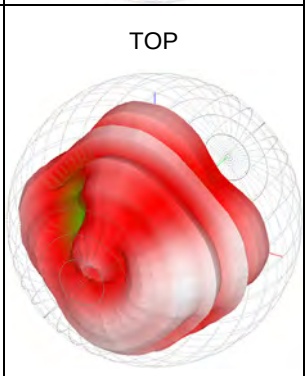
Operational Parameters:
Diffusion: Below <1KHz – 16+KHz
Asymmetric Scatter Pattern (2D)
Varied Low Frequency Absorption
Radical Phase Scattering

Ceiling or Wall Mountable
Various Sizes/Proportions/Options.



Sound Absorption Coefficients – Standard Pyramidal Diffuser									
Size	**Mounting**	**Weight**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**NRC**
2'x2'	D-5	3.58lbs	0.22	0.22	0.17	0.08	0.08	0.06	0.15
2'x2'	E-400	3.58lbs	0.24	0.22	0.16	0.11	0.10	0.11	0.15
2'x2' w/insulation	D-5	4.23lbs	0.57	0.41	0.38	0.21	0.16	0.16	0.30
2'x2' w/insulation	E-400	4.23lbs	0.35	0.28	0.23	0.14	0.11	0.16	0.20

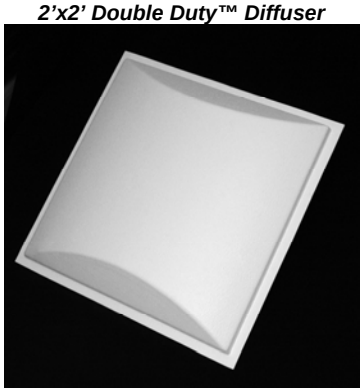
The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

Double Duty™ Diffuser

(Note: Test data from a 2'x2' model.)

2'x2' Double Duty™ Diffuser



Polycylindrical (barrel shaped) diffusers act to scatter sound in any location. Bass absorption will vary with size. A 2' X 4' has maximum absorption at 125 Hz. Increasing size to 4' X 8' lowers the point of maximum absorption to 63 Hz. Mid to high frequency absorption is typically 0.10 to 0.25.

Construction: Class A Thermoformed plastic with natural white finish.

Nominal Sizes: 2'x2', 2'x4', 4'x4' and *4'x8' (*Molded Fiberglass only).

Depth: 7"

Mounting: L-Bracket for direct mount to wall/ceiling
– OR – Manufactured to fit into standard T-bar grids.

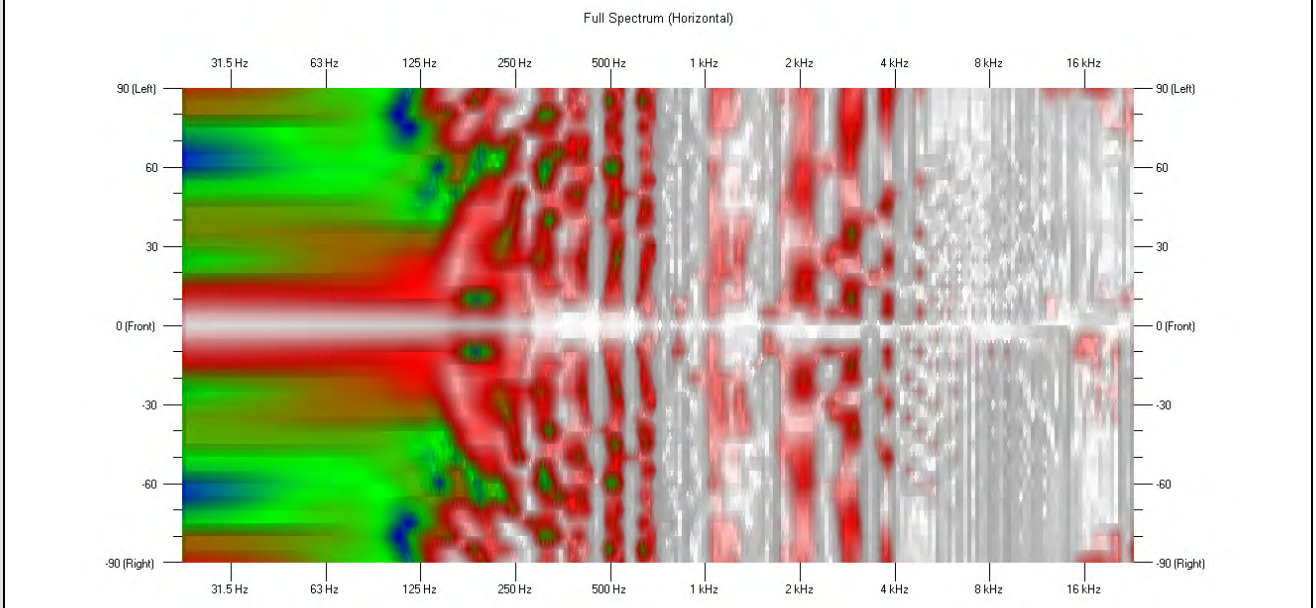
Internal cavity can be lined with a 1½" thick layer of glass fiber batting to increase absorption and prevent resonance.

Modified 1D Geometric Diffuser
Symmetric Design

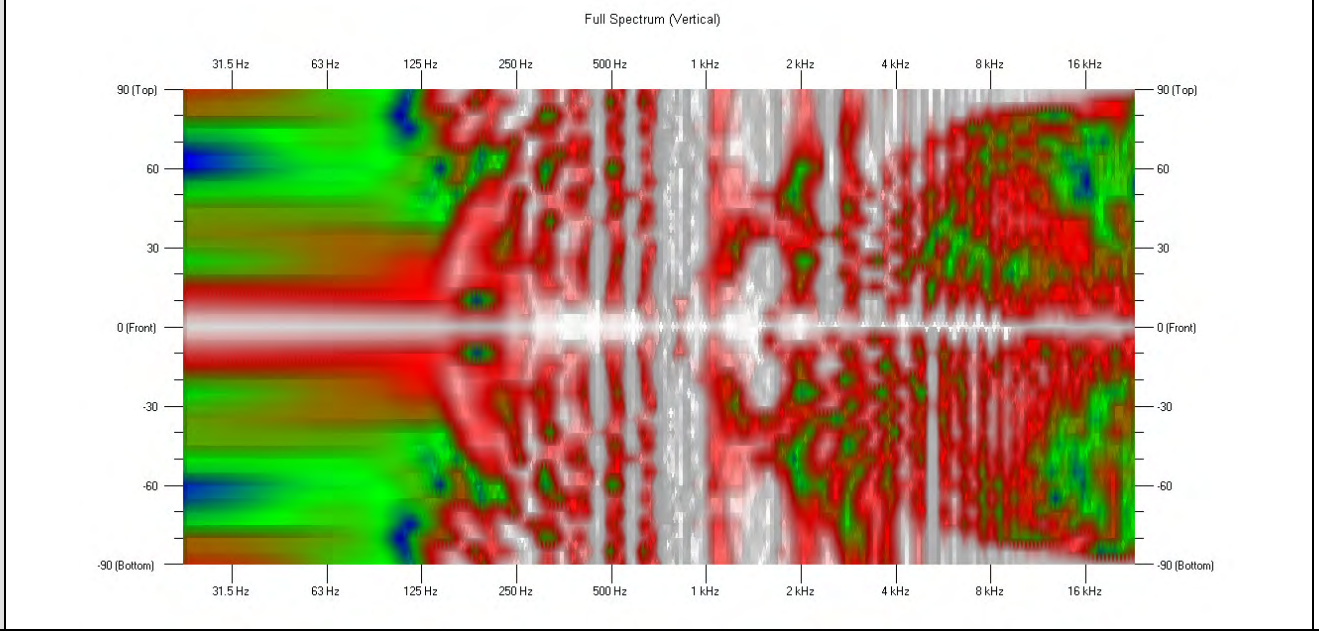
Operational Parameters:
Diffusion: <500Hz – 16+KHz
Wide 180° Scatter Pattern (1D)
Varied Low Frequency Absorption
Smooth Phase Response

Ceiling or Wall Mountable
Various Sizes/Proportions/Options.

Full Spectrum Response – Horizontal (180° – Left to Right)

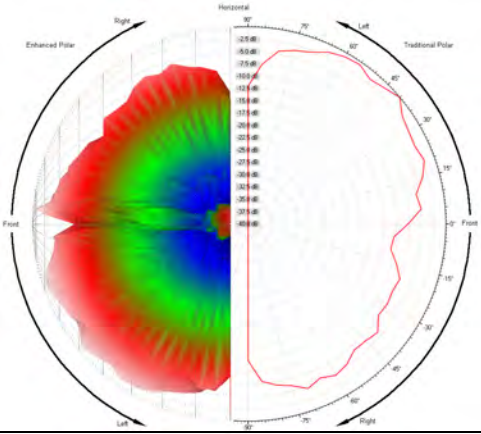
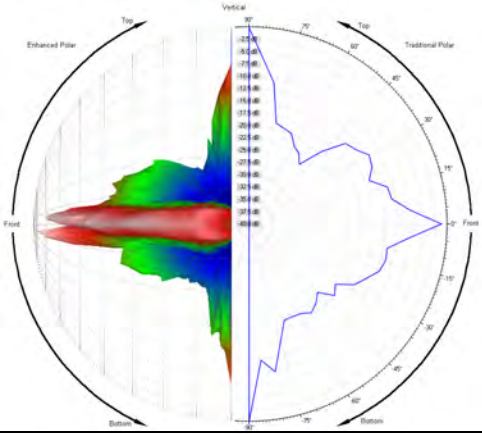
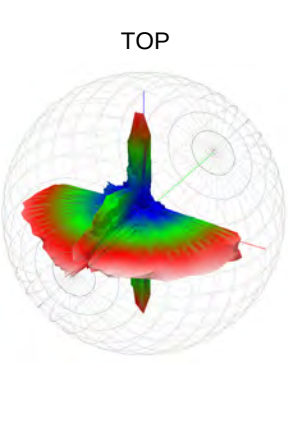
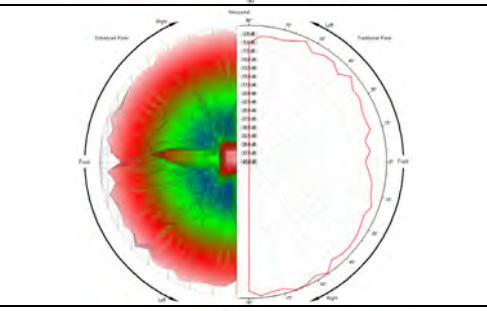
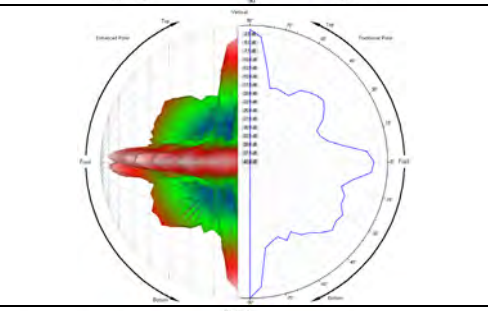
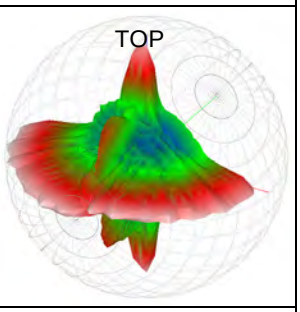
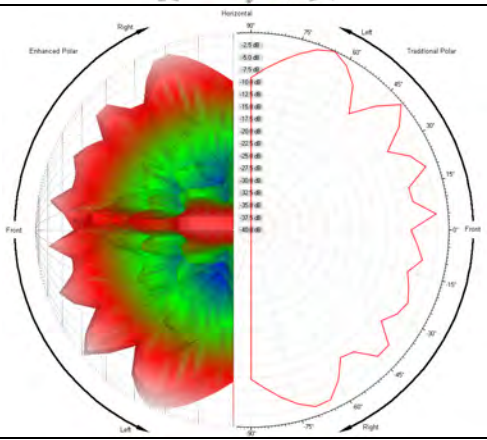
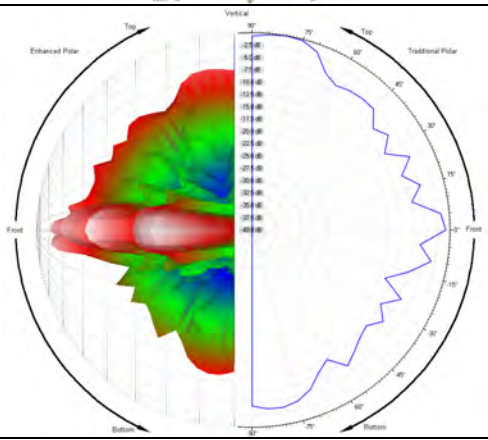
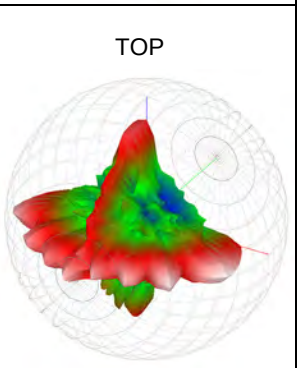
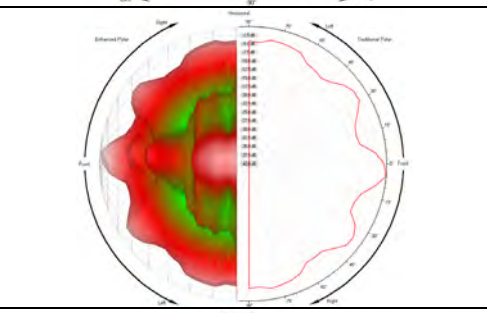
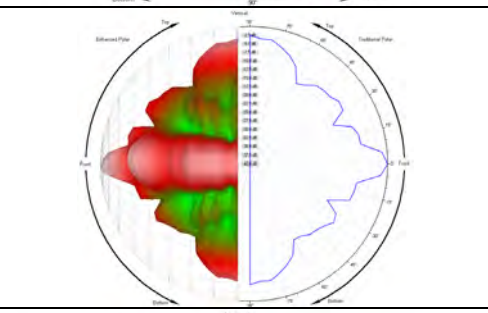
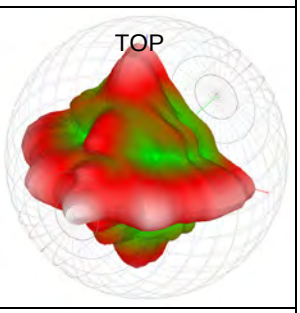
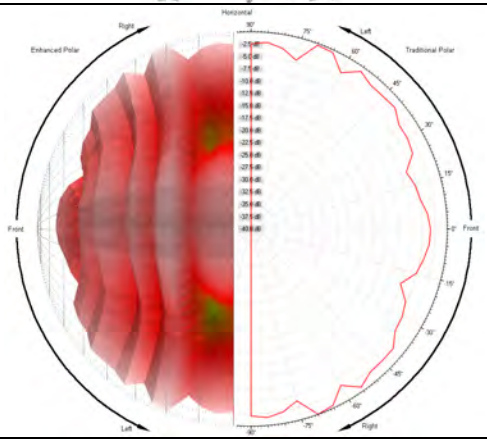
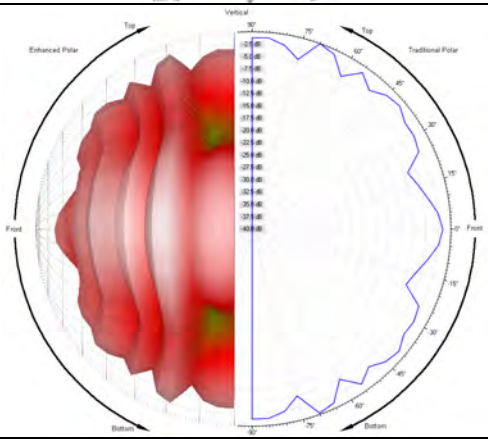
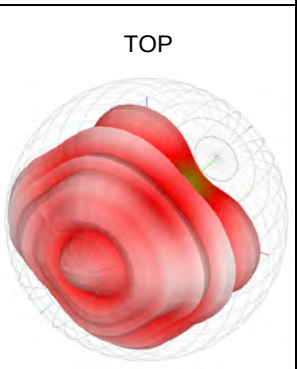


Full Spectrum Response – Vertical (180° – Top to Bottom)



Sound Absorption Coefficients – Standard Double Duty™ Diffuser									
Size	**Mounting**	**Weight**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**NRC**
2'x2'	D-5	4 lbs.	0.41	0.22	0.19	0.15	0.12	0.05	0.15
2'x2'	E-400	4 lbs.	0.33	0.27	0.19	0.15	0.11	0.11	0.20
2'x2' ^{w}/insulation	D-5	4.7 lbs.	0.64	0.28	0.26	0.18	0.11	0.15	0.20
2'x2' ^{w}/insulation	E-400	4.7 lbs.	0.33	0.24	0.21	0.16	0.10	0.15	0.20

The horizontal and vertical polars are displayed in Traditional and Enhanced format; the traditional view shows only the dB at an angle along the axis, the enhanced shows adjacent angles.

	Horizontal Polars – Enhanced/Traditional	Vertical Polars – Enhanced/Traditional	3D Polar Balloon – ¾ View
16000 Hz			
8000 Hz			
4000 Hz			
2000 Hz			
1000 Hz			

AcousticsFirst® CORPORATION

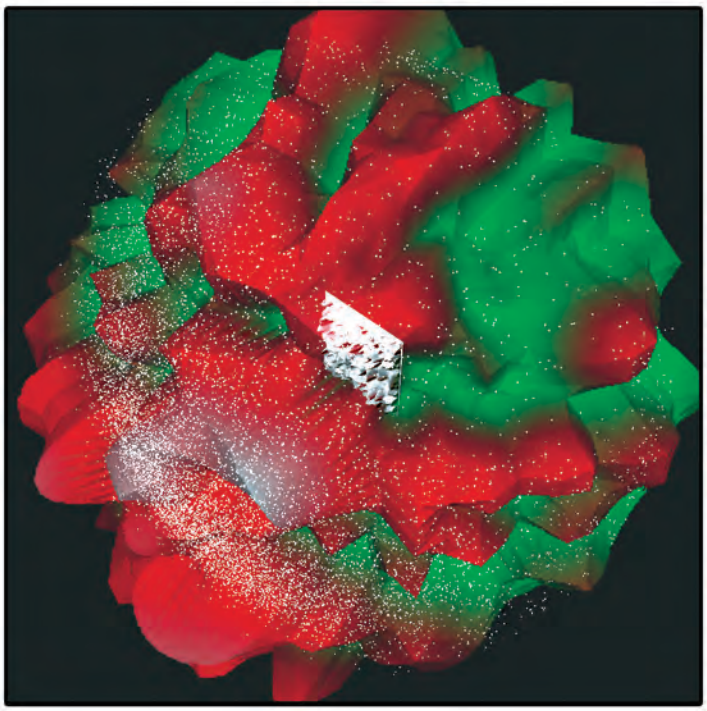
Materials to Control Sound & Eliminate Noise.™

The information within this booklet is only part of the data currently available on the materials that were tested. An electronic component is also available upon request. This electronic data allows for access to the raw test results, enabling further refinement, including previously absent data describing the phase of the reflections, attenuation, and directionality with a granularity exceeding all prior published data.

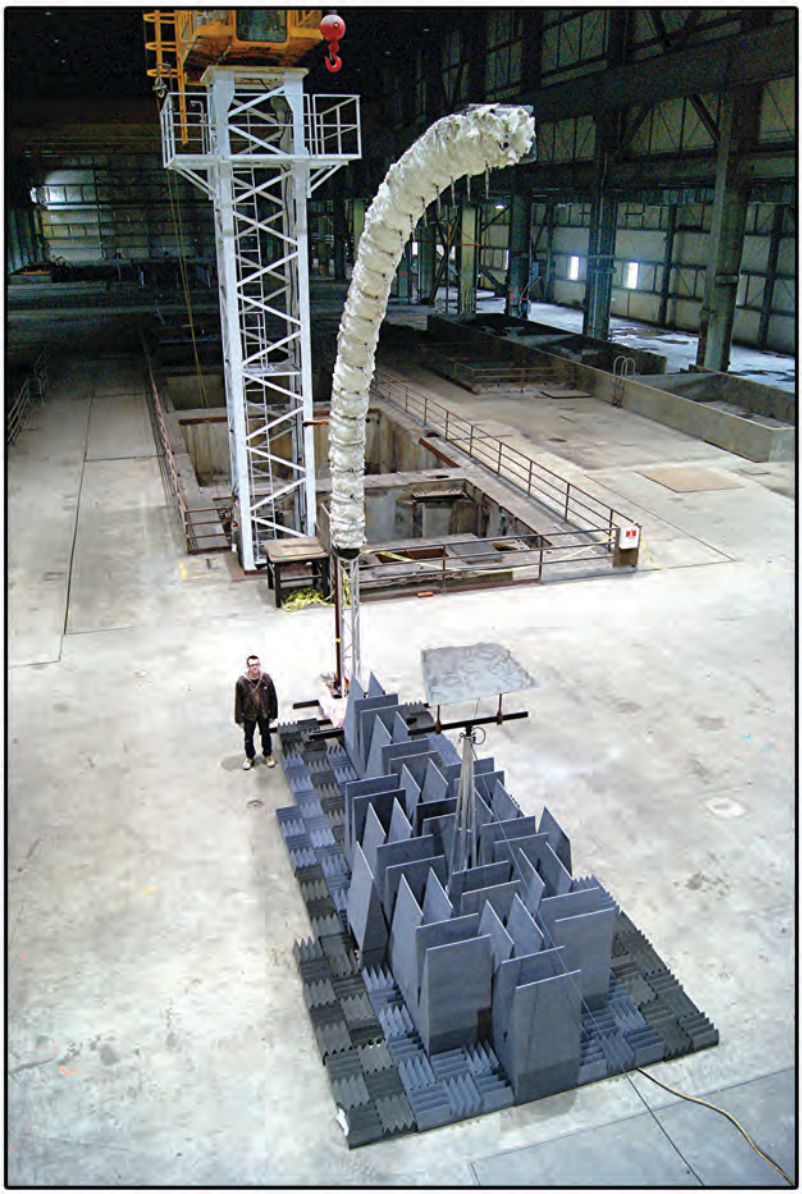
This electronic data has been compiled for Acoustics First by NWAA Labs in Elma, WA.

Acoustics First is offering this data without warranty, upon request, as no universally accepted standard currently exists.

Contact us for more information. Additional test data and product configurations appear on the web site. More information will be added as it becomes available.



Above: Virtual Testing developed by Acoustics First using particle modeling to illustrate the scattering of energy after impacting a surface - Overlayed with Real-World test balloon data for comparison.



Right: Real-world testing rig at NWAA Labs in Elma, WA, which collected much of the data contained in this work.

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