

*The First FRG Two Dimensional Molded QRD®
From The Acoustical Industry's Leading Innovator*

Diffusive ceilings and walls are one of the most effective ways to simultaneously control room reflections and provide a natural ambiance. Since ceiling systems and wall applications often cover appreciable surface areas, a cost-effective 2D diffuser is required. To meet these needs and life safety fire codes, RPG® developed the first non-combustible Fiber Reinforced Gypsum (FRG) modular 2D diffuser that regularly mounts in a standard T-bar system. The FRG Omniffusor™ uniformly scatters sound arriving from any direction into many directions, providing ideal distribution and coverage. Its unique shape also adds the visual interest of a bas-relief sculpture.

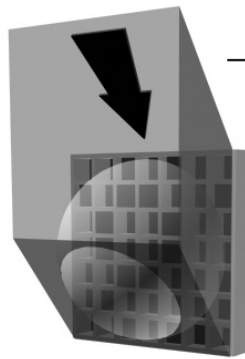
Problem and Solution

Problem

An "Acoustic Ceiling" has come to mean absorptive mineral or fiberglass tiles. These absorptive ceilings are now incorrectly used in spaces where music is to be enjoyed or speech is to be understood. The industry needed an appropriate sound diffusing tile for these applications.

Solution

The FRG Omniffusor™ is the first cost-effective, non-combustible, molded Fiber Reinforced Gypsum 2D QRD® sound diffusor. It offers twice the reflection attenuation of the 1D QRD®, because it scatters sound uniformly into a hemisphere. The FRG Omniffusor® provides uniform, omnidirectional, broad bandwidth diffusion in an attractive ceiling or wall design element.



Sound strikes a two dimensional diffusing surface and is uniformly scattered into a hemisphere.

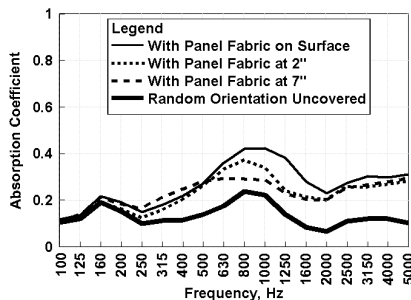
FEATURES

- 2D QRD® reflection phase grating
- Uniform hemispherical scattering for all angles of incidence
- Simultaneously offers diffusion and moderate mid band absorption when fabric covered
- 2D QRD® provides twice the diffusive specular attenuation of a 1D QRD®
- Non-combustible FRG
- Cost effective molded FRG panel
- Available in modular 2' x 2' panels
- Liteffusor™ can incorporate down lighting

BENEFITS

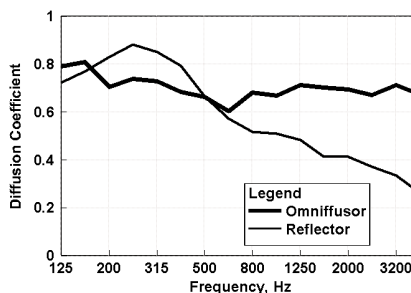
- The 2D QRD® provides phase variation in two orthogonal directions for uniform omnidirectional scattering
- Hemispherical scattering is ideal for ceiling applications because the incident sound is uniformly distributed throughout the room from a planar ceiling surface
- The omnidirectional diffusive attenuation, coupled with minimal absorption, provides ideal reflection control without deadening the space
- 2D diffusive attenuation provides effective diffusive control of strong specular reflections
- FRG is non-combustible and can be used in any space to meet life safety fire codes
- Low cost allows designers to cover large surface areas for optimum performance
- Modular 2' x 2' panels can be wall mounted or suspended in a 15/16" T-bar ceiling grid
- The central flat area (9-3/8" x 9-3/8") of the Liteffusor™ allows designers to incorporate down lighting, sprinklers, projector supports, and other design elements

Performance Specifications



Absorption

Recently, it was discovered that phase gratings, consisting of wells of different depths separated by dividers, also may provide nominal sound absorption. The absorption is caused by viscous losses created by high particle velocity flows over the dividers, between wells of different depths, and resonant frequencies. The absorption can be enhanced by placing a resistive element, e.g. fabric, near the face of the phase grating. The graph illustrates the performance uncovered, with fabric on the surface and at 2" and 7" above the surface.

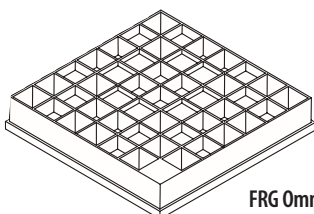


Diffusion

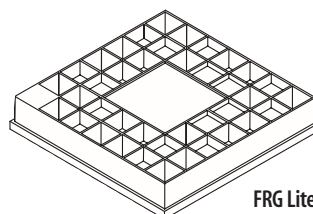
The FRG Omniffusor™ offers significant diffusion compared to a flat reflector panel above the diffraction limit of 565 Hz, which is determined by the dimensions of the panel. Above this frequency, the graph indicates how the reference reflector becomes more and more specular as the frequency increases, whereas the FRG Omniffusor™ provides a constant diffusivity.

Installation

When suspended in a 15/16" T-bar grid, the FRG Omniffusor™ and FRG Liteffusor™ protrude 3-1/4" into the room. Wall mounting the FRG Omniffusor™ requires custom wooden stiles and rails with a 1/8" dado to capture the perimeter flange.



FRG Omniffusor™



FRG Liteffusor™

APPLICATIONS

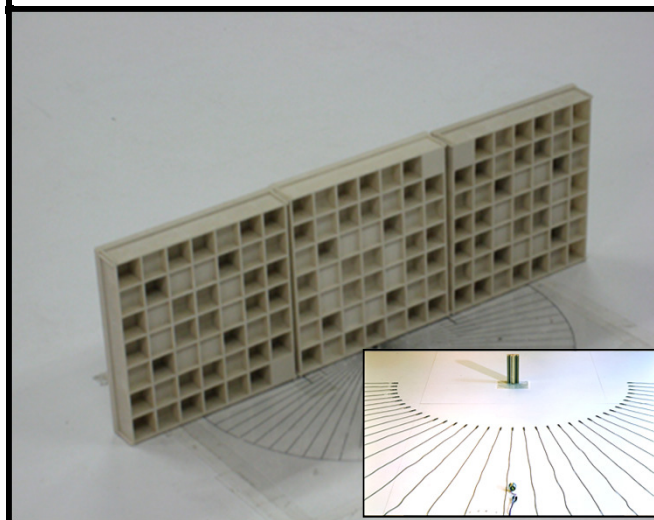
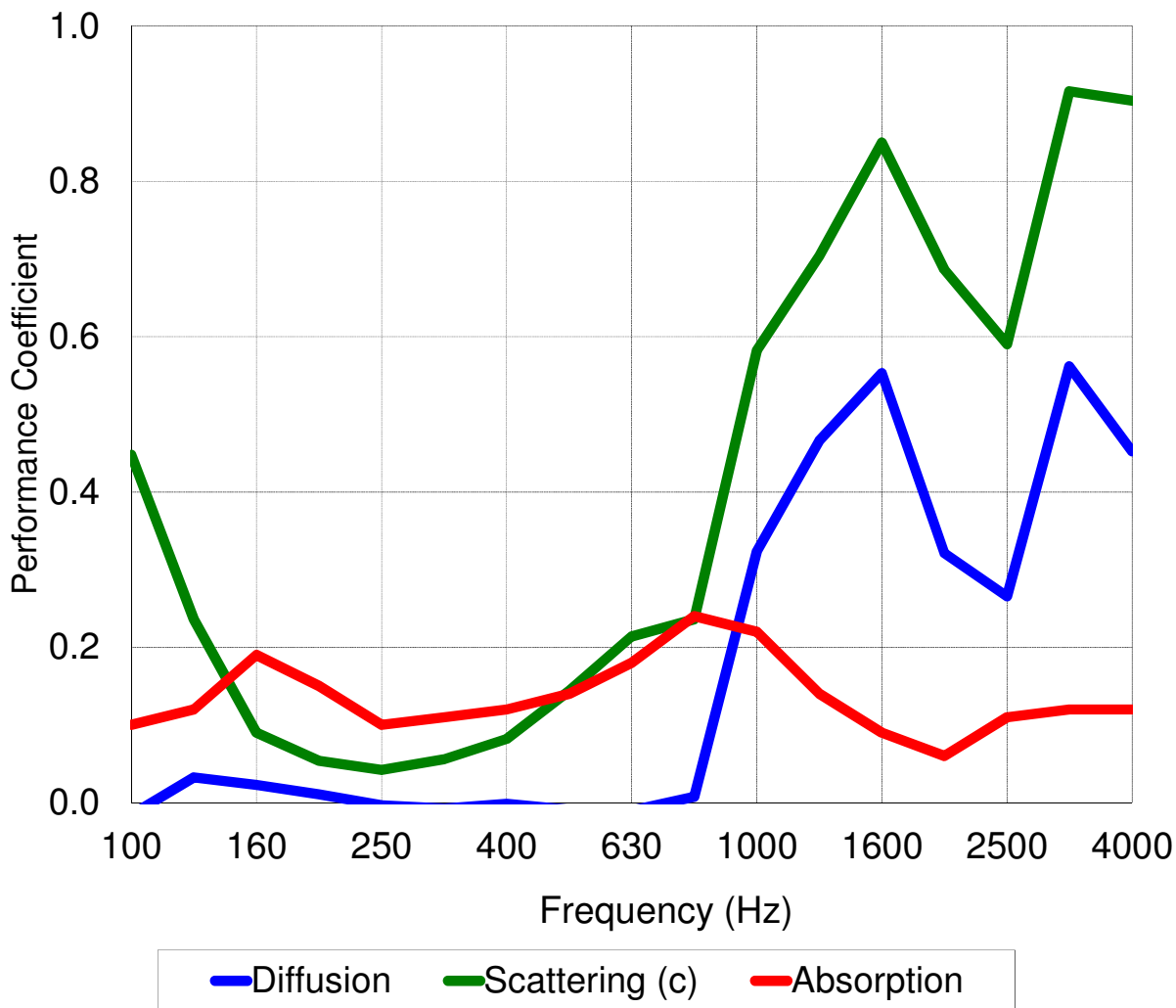
Auditoriums, Music Rehearsal Rooms, Mastering studios, Performing arts facilities, Post production studios, Broadcast studios, Worship spaces, Recording studios, Listening rooms, Home theaters, Conference rooms

SPECIFICATIONS

- Size: 23-5/8" (L) x 23-5/8" (W) x 4" (D)
- Tegal Dimensions: 23" (L) x 23" (W) x 3-1/4" (D)
- Liteffusor™ central flat area: 9-3/8" x 9-3/8"
- Standard finish: painted white
- Custom finishes available
- Weight: 18 lbs.



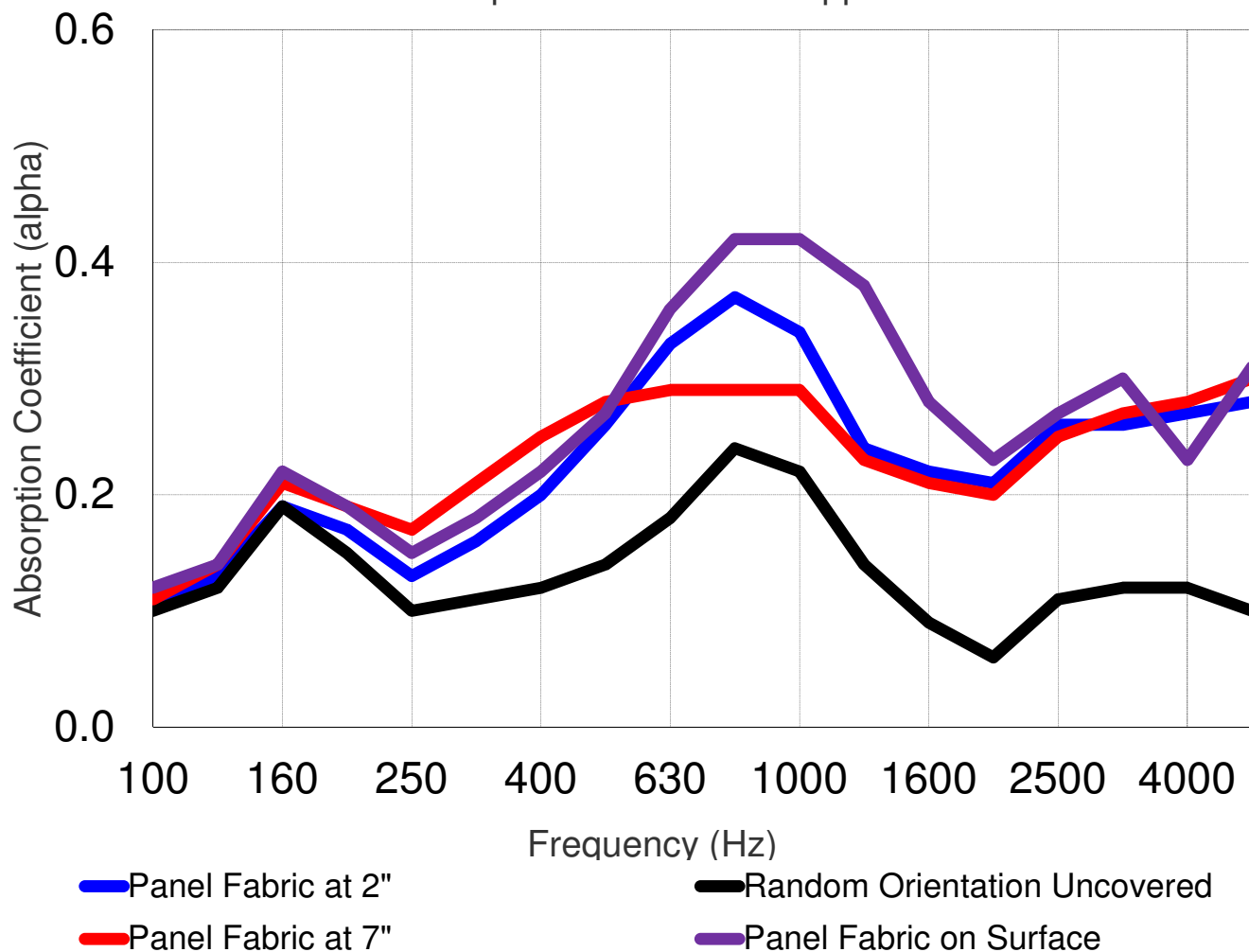
Omniffusor® FRG *Random Incidence* Performance Data



f (Hz)	Diffusion	Scattering (c)	Absorption
100	-0.02	0.45	0.10
125	0.03	0.24	0.12
160	0.02	0.09	0.19
200	0.01	0.05	0.15
250	0.00	0.04	0.10
315	-0.01	0.06	0.11
400	0.00	0.08	0.12
500	-0.01	0.14	0.14
630	-0.01	0.21	0.18
800	0.01	0.24	0.24
1000	0.32	0.58	0.22
1300	0.47	0.70	0.14
1600	0.55	0.85	0.09
2000	0.32	0.69	0.06
2500	0.27	0.59	0.11
3150	0.56	0.92	0.12
4000	0.45	0.90	0.12



Omniffusor® Supplemental Random Incidence Absorption Data - Fabric Applied At Unit Face



Chesapeake Acoustic
Research Institute,
LLC



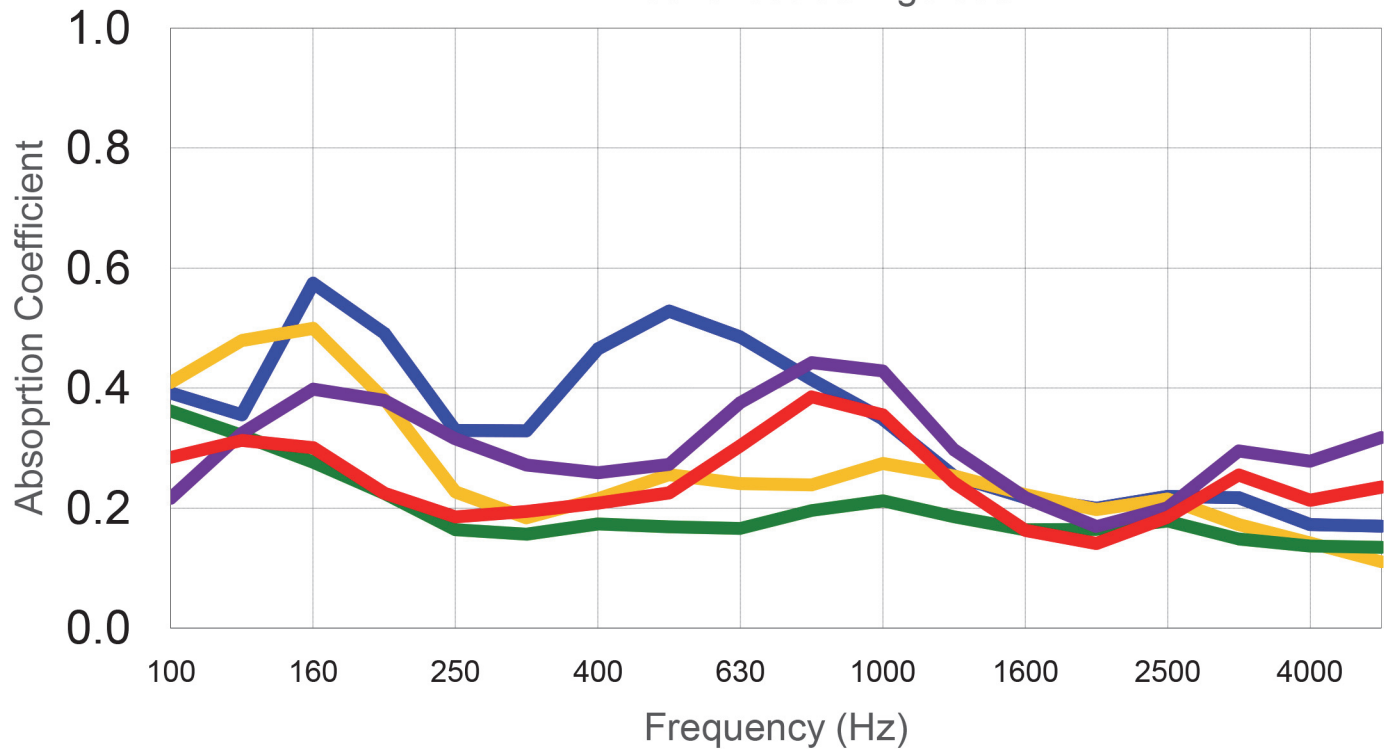
Hz	Panel Fabric on Surface	Panel Fabric at 2"	Panel Fabric at 7"	Random Orientation Uncovered
100	0.12	0.11	0.11	0.10
125	0.14	0.13	0.14	0.12
160	0.22	0.19	0.21	0.19
200	0.19	0.17	0.19	0.15
250	0.15	0.13	0.17	0.10
315	0.18	0.16	0.21	0.11
400	0.22	0.20	0.25	0.12
500	0.27	0.26	0.28	0.14
630	0.36	0.33	0.29	0.18
800	0.42	0.37	0.29	0.24
1000	0.42	0.34	0.29	0.22
1250	0.38	0.24	0.23	0.14
1600	0.28	0.22	0.21	0.09
2000	0.23	0.21	0.20	0.06
2500	0.27	0.26	0.25	0.11
3150	0.30	0.26	0.27	0.12
4000	0.23	0.27	0.28	0.12
5000	0.31	0.28	0.30	0.10



RPG® Sound Diffusing Ceiling Tiles

Random Incidence Performance Data

E-Mount Test Configuration



- Formedffusor
- Harmonix-K
- Harmonix-G
- Omniffusor-Wood
- Omniffusor-FRG

Chesapeake
Acoustic Research
Institute, LLC



Hz	Formedffusor	Harmonix-K	Harmonix-G	Omniffusor-Wood	Omniffusor-FRG
100	0.39	0.41	0.36	0.22	0.28
125	0.36	0.48	0.32	0.32	0.31
160	0.57	0.50	0.28	0.40	0.30
200	0.49	0.38	0.22	0.38	0.23
250	0.33	0.23	0.16	0.32	0.19
315	0.33	0.18	0.16	0.27	0.19
400	0.47	0.22	0.17	0.26	0.21
500	0.53	0.26	0.17	0.27	0.23
630	0.49	0.24	0.17	0.38	0.30
800	0.41	0.24	0.20	0.44	0.39
1000	0.35	0.27	0.21	0.43	0.36
1250	0.25	0.25	0.19	0.30	0.24
1600	0.22	0.22	0.16	0.22	0.16
2000	0.20	0.20	0.16	0.17	0.14
2500	0.22	0.22	0.18	0.20	0.19
3150	0.22	0.17	0.15	0.30	0.26
4000	0.17	0.14	0.14	0.28	0.21
5000	0.17	0.11	0.13	0.32	0.24