DiffuseReflections

The Newsletter for Progressive Acoustics Research

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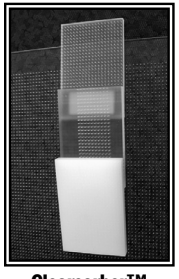
Research & Development



Clearsorber™

RPG is proud to announce the Next Generation of transparent and transfucent microperforated panels that provide significant absorption without using a fibrous porous absorber backing

IN THIS ISSUE

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For up to the minute information, we invite you to visit RPG's acclaimed web site: http://www.rpginc.com.

DIFFUSE NEWS

Dr. Peter D'Antonio
President and CEO

Everything Acoustic!

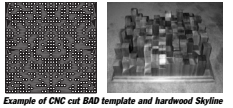
As our society evolves, acousticians are called upon to provide new solutions to meet ever changing challenges. Architects have long sought alternatives to porous absorbers and continually ask for transparent absorbers that do not require porous backing panels. We are happy to announce a solution to both problems in our new line of fiber free transparent microperforated panels. These panels range in thickness from foils up to sheets 15 mm thick.

Since we would like to provide information acousticians find useful, we invite you to suggest topics for presentation in this advertorial, as well as our biweekly Diffuse Bulletins, archived at http://www.rpginc.com/diffusebulletin/index.htm, by contacting me at pdantonio@rpginc.com. ***This is only the beginning.....***

CONTINUALLY EVOLVING.....

Komo VR 512 Mach II SHO. 5' x 12' table, extended Z travel, high speed operation and fully automated 3D software

"I thought RPG only made diffusors". We often hear comments like this from acousticians, who are surprised at the vastly broadened product line RPG now offers. Yes, RPG is known worldwide as the leading developer and manufacturer of sound diffusing surfaces and we offer the widest range of these Acoustictools. What might not be as well known is that RPG actually offers the widest range of sound absorbing surfaces as well, a point we will address in future issues of Diffuse Reflections. Another fact that might also not be widely know is that RPG has developed a powerful and extensive manufacturing capability, including CNC table saws, routers, 6-head wood moulders, metal punches, laser cutters, glass reinforced gypsum (GRG) molding, thermoforming and custom finishing. RPG is therefore unique in the industry, as not only a leading research and development company, but also a leading acoustical manufacturer, offering custom, as well as standard products. In this issue, we wanted to highlight our new Komo CNC router. Komo's Mach II SHO



Example of CNC cut BAD template and hardwood Skyline

series CNC router is engineered to fulfill a wide range of needs. The Mach II SHO is a versatile, heavy-duty work cell that produces consistently superior parts and delivers better part finishes at the highest cutting speeds - up to 3150 ipm! The Mach II SHO eliminates wasteful separate production steps and in one economical station, you can rout, drill, shape and profile parts from full sheet nests in one seamless, integrated process, under fully-automated 3D software control. The large 5' x 12' table size and extended depth of cut accommodate very large parts.

As RPG continues to grow and evolve, we invite consultants and architects to begin thinking of RPG for their standard and custom acoustical product specifications in wood, metal, transparent and opaque plastic, GRG, masonry, foam, fabrics and metal, as well as non-acoustical support items that complement the acoustical treatment. ■■■

BASS MANAGEMENT

8Every now and again revolutionary new technology is introduced that changes the status quo and offers design professionals new tools to solve chronic problems. In 1983, RPG introduced the first commercial line of reflection phase gratings, called the RPG Diffusor System and provided acousticians with a new design tool. This sound diffusion system has now been used in thousands of applications in almost every segment of the architectural acoustics industry.

Today, we are proud to introduce a new low frequency absorptive technology, as part of the new RPG Absorbor System, which we believe will make an equally significant impact on passive bass management. This innovative technology, patented by Dr. Helmut Fuchs and his team at the Fraunhofer IBP in Stuttgart, involves the use of a proprietary 1m x 1.5m, unclamped and freely vibrating 1mm or 2.5 mm powder coated steel plate, whose bending modes are heavily damped by adhesive coupling with a 100 mm porous absorbing rear panel. The plate and porous backing act together in a mass-spring manner offering absorption via three mechanisms shown schematically in Figure 1. First, incident sound (1) excites the metal plate (2) into pistonic motion (3), providing absorption down to 50 Hz by vibrating against the "spring" of the polyester backing (4). Second, the bending modes (5) of the free-moving plate are heavily

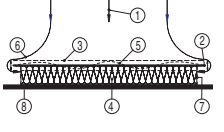


Figure 1. ***Schematic of three absorption mechanisms combined in RPG's new modal control modules.***

damped by the proprietary adhesive coupling with the porous backing (4) absorbing up to about 125 Hz. Lastly, mid-frequency sound waves diffract around the plate's edges (6), through a perforated frame (7), to be propagated and thus dissipated in the deep passive porous absorber layer mounted against a rigid boundary (8). Together, these mechanisms offer the industry's first truly efficient, broad bandwidth low frequency absorber with a shallow profile of only 4 inches. To extend absorption up to 5,000 Hz, additional porous absorption can be bonded to the face of the metal plate and concealed behind powder coated perforated metal.

Figure 2. Left- Modex Plate; Right- Modex Broadband. Black freestanding mount is for display purposes only to simulate wall mount.

This technology is utilized in two products affecting different frequency ranges. The **Modex Plate™** (Figure 2-left), acts like a high pass filter offering absorption between 50 and 500 Hz and the **Modex Broadband™** (Figure 2-right), acts like an all cut filter, offering efficient absorption from 50 Hz to 5,000 Hz. The absorption coefficients of these two products are contrasted with a 100 mm porous absorber in Figure 3, according to ISO 354/ASTM 423, measured in a specially damped chamber. Since conventional reverberation chambers are not accurate at low frequencies, a special technique, which monitors the decay of the first five axial modes in a small rectangular chamber, was developed to measure absorption down to 30 Hz. Results are illustrated in Figure 4. The Modex Plate and Broadband should be mounted at the high pressure locations in the room for highest efficiency. We believe that you will be astonished at the clarity modal control provides. **Now you can absorb more bass in less space!** ■■■

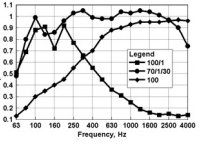


Figure 3. Comparison of the absorption coefficient for Modex Plate (100/1: 100 mm Polyester, 1 mm Plate), Broadband (70/1/30: 70 mm Polyester, 1 mm Plate, 30 mm Polyester), and 100 mm of Polyester.

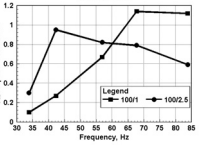


Figure 4. Absorption coefficient of Modex Plates 100/1 and 100/2.5 from the decay of the first five axial modes in a 5x4x3 m chamber.