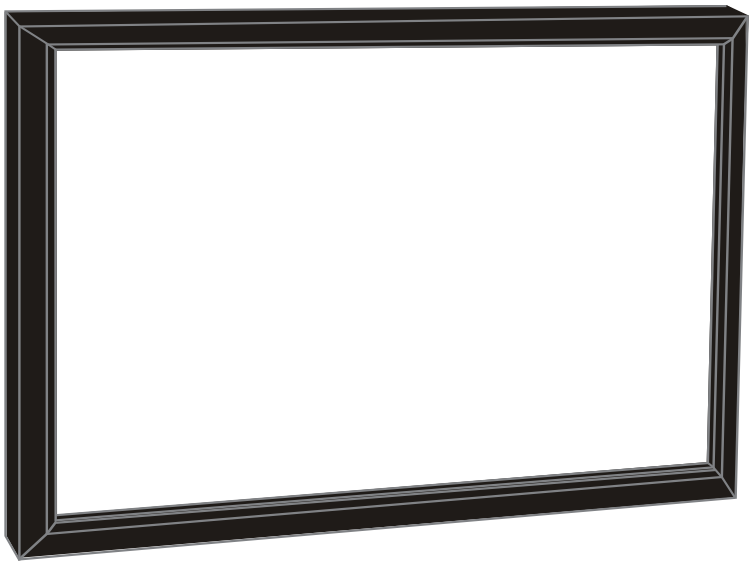


ACOUSTIWEAVE™ FILM SCREENS

A DETAILED GUIDE TO THE TECHNOLOGY

The commonly known category of "perforated screens" actually includes both perforated *and* woven screen materials. Perforated screens are created by making holes or "perforations" in a solid piece of material, while woven screens use a fabric weave that includes holes.

Common to both technologies are issues with audio frequency limitations and issues that the "holes" create for the video.

Dragonfly™ screens with AcoustiWeave™ offer you and your customers an exciting and reasonably priced way to get the most out of a dedicated home theater. This technology allows for the placement of all three front speakers *directly behind the screen* for more localized audio-imaging performance. "Localized" performance simply means that the voices will appear to be coming from the location that the actors are positioned on the movie screen. This technology also allows for the use of larger screens since there is no need to reserve space to the left and right of the screen to mount speakers.

Contents:

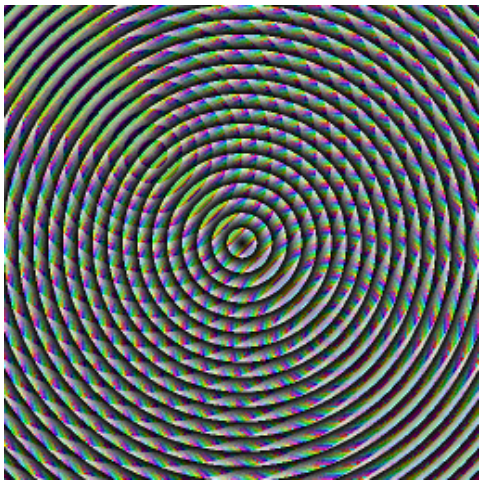
MOIRÉ EFFECT

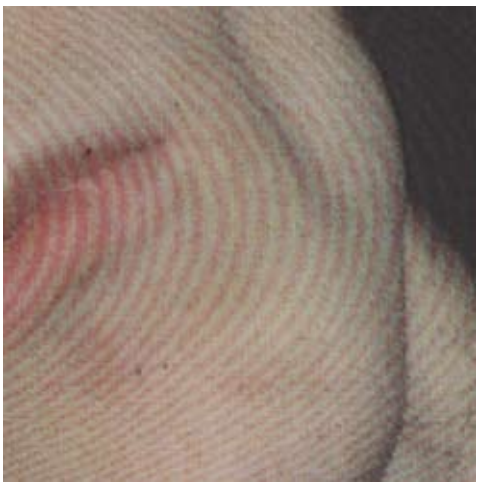
AcoustiWeave™ screens are porous, meaning that there are "holes" in the weave of the fabric. This fabric has been developed with a 4% vacancy, meaning that 4% of the surface is actually holes. The AcoustiWeave™ fabric also features consistent fiber alignment to create a "matte" looking finish to the surface. This provides exceptional light reflection properties as well as acoustical transperancy. However, this technology creates a draw back that needs to be adjusted for – holes allow air *and* light through.

When installing any perforated screen over a reflective surface, some light projected at the screen from the projector may pass through the holes. This light will reflect off the surface behind the screen and interact with the light being reflected from the surface of the screen creating a Moiré pattern.

Moiré refers to an optical effect caused by the interaction of two sets of parallel lines (or points arranged in lines) where the lines are at a slight angle. For example, if we have a TV image of a pattern of closely-spaced parallel lines which are not quite horizontal, we will see a "swirl" pattern in the image. This is what is referred to as moiré.

Examples:





ELIMINATING MOIRÉ EFFECT

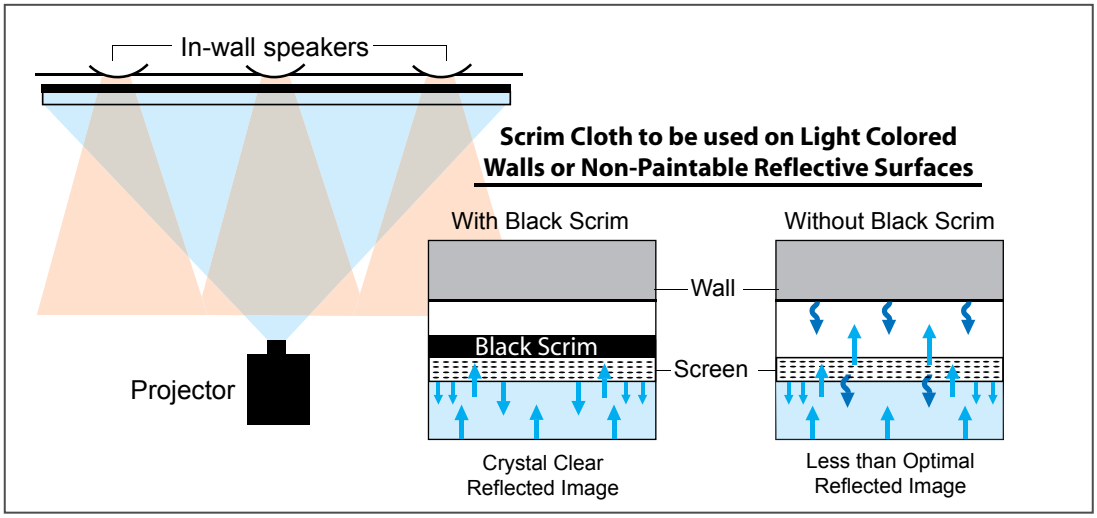
The AcoustiWeave™ screen eliminates the moiré effect in two ways.

First, through a combination of weave pattern and angle of cut, AcoustiWeave™ screens are much less susceptible to moiré pattern right out of the box. Hang these screens following the included installation instructions and they will outperform all other woven screen materials.

Second, every Dragonfly™ film screen with AcoustiWeave™ comes with a black scrim to install behind the screen. You can use the whole cloth to hang behind the entire screen, cut it down small enough to just place over speakers, or any combination thereof. Using the included scrim to darken the area behind the screen offers a two fold benefit: 1. further reduction of moiré by eliminating reflected light coming back through the screen and 2. improvement of picture contrast.

We recommend using the included black scrim, however similar benefits can also be achieved by painting the walls, as well as the speaker flanges (if they happen to be white), a dark matte color (black being the best). Black, as you know, absorbs light and eliminates this bounce-back effect.

There is no hi-tech or fancy method to installing the scrim. Avoid overlapping the scrim in front of the speakers, creating multiple layers of fabric for the sound to travel through. This will reduce the performance of the theater.



WHAT THE EXPERTS ARE SAYING

We asked Alan Brawn of Brawn Consulting, the leading expert in film screen measurement and performance for our industry, to test our screens. The results his lab provided us prove that we have done it right:

"No visible moiré at normal viewing distances."

"Screen gain measured 1.3-1.35"

"No hot spotting"

"Screen performed equal to a matte white reference sample."

SPEAKER SELECTION

AcoustiWeave™ film screens are engineered to maintain the quality of your projected image and avoid the acoustic distortions that speaker placement around a television or non-acoustically transparent fixed frame screen may create. AcoustiWeave™ screens do not acoustically reflect, distort, refract, or reduce the imaging capabilities of your speakers.

Since the majority of home theater sound either initiates or solely comes from the center channel speaker, placing it centered behind the screen will provide more localized sound imaging than placing it above or below the screen and trying to compensate by using your surround processor's calibration adjustments. By simply installing the center channel so that the tweeter is in horizontal alignment with the left and right speakers, you will greatly improve the home theater's audio performance. This also allows the use of identical speakers as LCR's, and eliminates the "acoustic dip" created when sound travels across the front stage between the LCR speakers that are different in performance or horizontal alignment in any way.

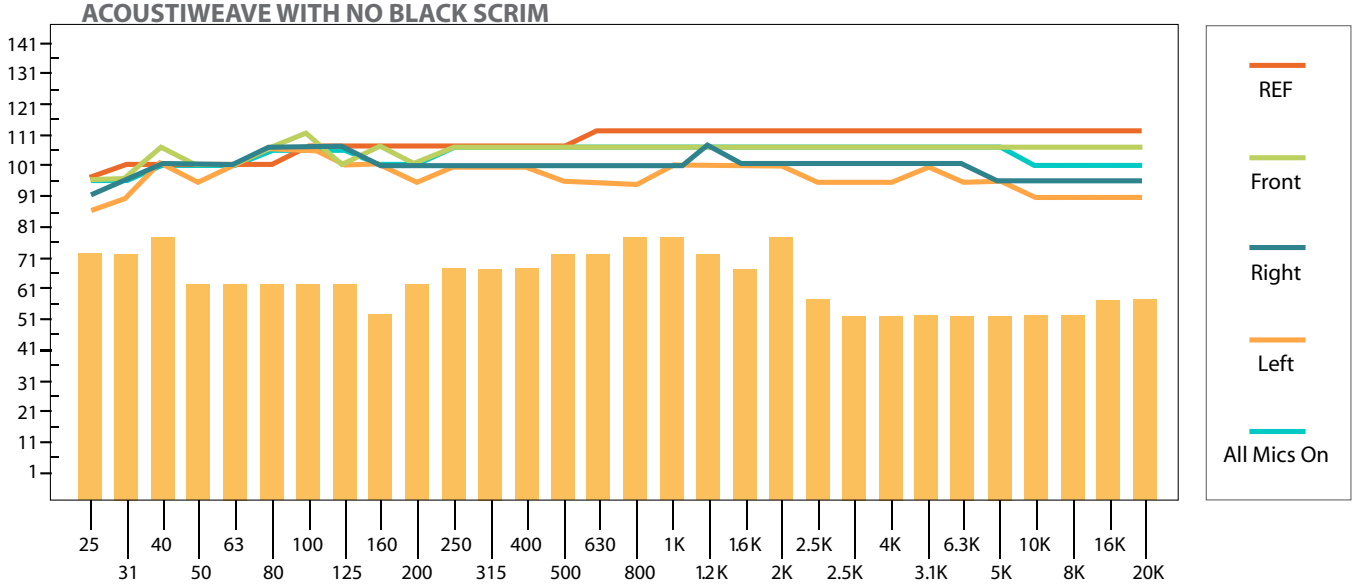
ACOUSTIC PROPERTIES

At Snap AV's Product Development lab, we have also fully researched and modified the acoustical properties of the AcoustiWeave™ film screen to achieve optimal acoustic performance. We used a "real" home theater room equipped with 30% sound dampening materials, 5/8" drywall and wood stud construction to reproduce a typical home theater installation setting. We also used our Episode™ HT-650LCR as our reference speakers. We chose to not use an anechoic chamber in our testing because we wanted to use real world environments.

Testing was conducted with real time analyzer, 4 microphones, averaging software and controlled frequency generator: 1 reference microphone placed 1 foot away from the speaker, behind the screen. 3 additional microphones, representing left, center and right room positions were placed 3 feet in front of the screen (audience side).

Visual 1 below represents the results when the AcoustiWeave™ screen is introduced. From frequency ranges of 250hz to 8Khz, there is no drop off or spike in acoustic performance of the combined microphones, and only a 5dB drop from the reference microphone at 630hz to 8Khz. What does this tell us? In these key frequency ranges, which specifically are vocals and most dynamic audio responses, there is only a minute amount of absorption by the screen (even air isn't perfectly acoustic) and therefore results in a slightly flatter presentation.

ACOUSTIWEAVE WITH NO BLACK SCRIM



dBstep : 5 Weighting : FLAT Decay : FAST Mode: AVG Peakhold: OFF Filter: II

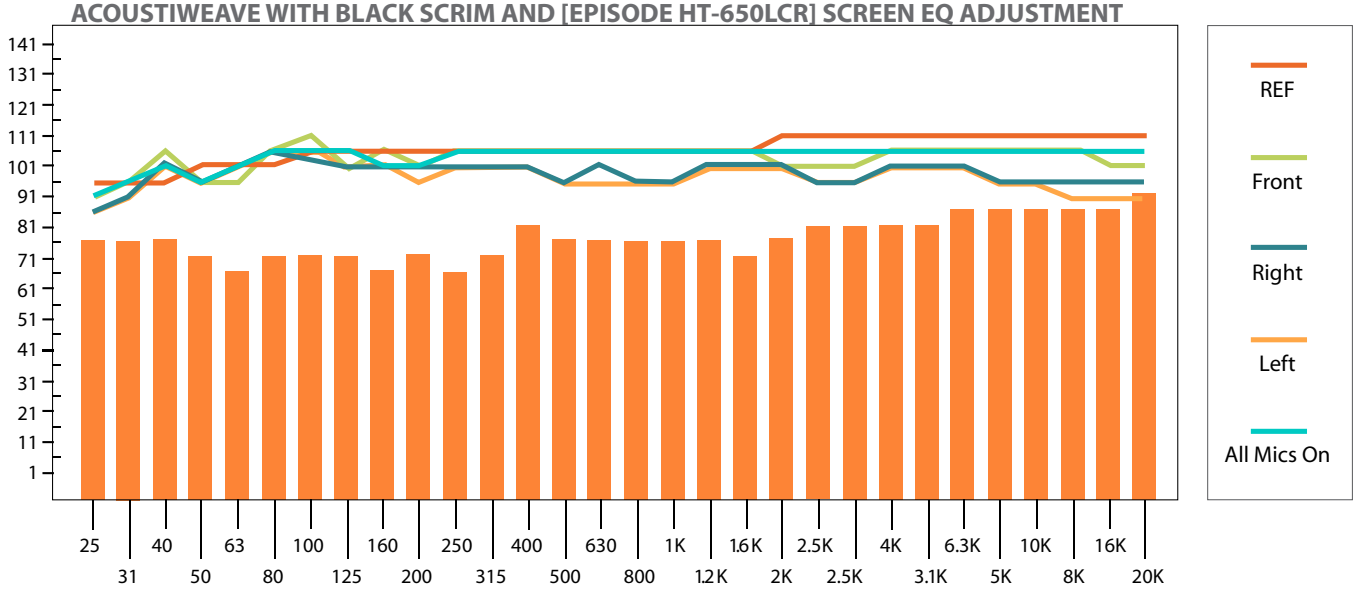
Comments: Pink Noise @ 91db, no screen BQ Pioneer VSX-91 @ -10

ACOUSTIC PROPERTIES

Going the next step, we introduced the black scrim directly over the same speaker but used the Screen EQ adjustment on the speaker. In Visual 2, we see a rather interesting phenomena: the combined microphone response was even better. From 250hz to 1.6Khz, we attained matched performance to the reference microphone with the left, center and right mic's, with still only a 5dB drop from 1.6Kh to 20Khz. It also even improves and smoothes the entire performance instead of dropping down at 10Kz as noticed in Visual 1.

Bottom line – set up your theater, use your processor's on-board auto EQ adjustments or use an RTA and manual EQ, and you can get every bit the performance out of a theater using our AcoustiWeave film screens as you will using our other film screens with the speakers exposed.

ACOUSTIWEAVE WITH BLACK SCRIM AND [EPISODE HT-650LCR] SCREEN EQ ADJUSTMENT



dBstep : 5 Weighting : FLAT Decay : FAST Mode: AVG Peakhold: OFF Filter: II

Comments: Pink Noise @ 91db, with screen EQ and Speaker Cloth and Woven Screen Material.
Pioneer Elite VSX-91tx volume @-10

WHAT THE EXPERTS ARE SAYING

We asked Alan Brawn of Brawn Consulting, the leading expert in film screen measurement and performance for our industry, to test our screens. The results his lab provided us prove that we have done it right:

"Measuring only screen material, there was an attenuation of .6 to .85 decibels"

"With black scrim added the decibel attenuation did not exceed 1 decibel."

"Overall: The screen produces a clean and clear image… Color reproduction was accurate…"