



Seymour-Screen Excellence Enlightor™ 4K Acoustically Transparent Projection Screen

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Seymour AV makes high-performance, yet moderately priced acoustically transparent screens, audio power amplifiers (200 to 1,000 watts per channel), and audio cables in Ames, Iowa and their products are sold “factory direct” to customers. When Chris Seymour wanted to take acoustically transparent screens to the next level, he started a partnership with UK-based Screen Excellence and established a dealer/installer network. That’s where the Seymour-Screen Excellence brand name comes from. One thing you’ll find out very quickly about Chris Seymour... he doesn’t take himself too seriously. Everything I’ve seen online and in printed info that came with the screen has a fair measure of humor, often in the form of puns or other word play.

The reviewed screen was an 8-foot wide 16:9 model, with the bottom of the frame about 20 inches from the floor. The screen material is Enlightor-4K, a fabric with interesting properties that make it viable, perhaps even among the best, acoustically transparent screen materials. Acoustically transparent screens typically don’t measure up to their name because they simply are not acoustically transparent. They are either woven materials or solid materials with holes punched in the material to allow some sound penetration. Most of these materials don’t bother midrange and bass frequencies too much, but higher frequencies are attenuated noticeably, requiring a fair bit of work to get reasonably smooth frequency response at the listening position. The Enlightor-4K material appears to be a solid screen when there is no backlighting. You can put your nose right up to the screen and not see a hole anywhere. It does look like a solid-surface screen. There is a barely visible texture to the screen, but the “pattern” of the texture is so fine and so tight, it appears to be inconsequential. To see that texture, you have to be very close to the screen surface. S-SE says there’s no minimum viewing distance recommended for these screens because you will see individual HD pixels far sooner than you will ever see any texture from the screen fabric.

Most people will assume “fabric” means there are horizontal and vertical threads woven together, as we’re used to seeing in fabric woven on a loom. The Enlightor-4K material is unconventional because the fibers are, somehow, laid in a completely random pattern that lacks visible holes between fibers. Backlighting the fabric reveals the random pattern and random distribution of holes of many sizes, most so small they almost look like ultra-thin spots in the fabric rather than holes. This is excellent “hole management” for high-definition projection screens. Most screens with punched holes have a regular, defined, hole pattern that can

produce moiré patterns in images with the right content. The Enlightor-4K material has such a tight weave that the “4K” in the name refers to the screen being suitable for use with 4K sources (more than double the resolution of HDTV and Blu-ray™).

One of the primary concerns about acoustically transparent screens is “How much light is lost?” Joe Kane has done demos where he places a solid screen behind an acoustically transparent screen to show that so much light gets through that you can actually see the images on the second screen. I have about 8.5 feet of space behind the screen where five equipment racks are located. That whole area is lit up nicely when a full-screen image is projected on the S-SE screen. The S-SE screen is translucent enough to be able to see the projected image (reversed, of course) on the back of the Enlightor-4K material. To counteract the light coming through the screen being a problem and to make less of an issue of light from LEDs or front-panel displays that might be located behind the screen being an issue, an optional black backing material can be assembled to the frame after installing the screen material. This black cloth is part of the acoustically transparent performance of the S-SE screen and barely impacts audio, perhaps an additional loss of 0.5 dB on top of the approximate 2 dB loss from the Enlightor-4K material. The black material traps projector light passing through the screen and blocks lights from equipment that may be behind the screen. It can’t really stop a bright light, like a lamp or flashlight, shining directly on the back of the screen, but few would expect to be able to light the area behind the screen that way anyway. If there’s nothing but black space behind your screen, you may not even need the black backing material. But reflections off of loudspeakers, or components, or LEDs behind the screen will need to have their light/reflections blocked by the black cloth. Any loudspeakers placed behind the screen will be washed with light if the black material layer is not used. So those loudspeakers have to be completely non-reflective if you want to avoid using the black backing material. If there are reflections from anything on any loudspeaker behind the screen, you’ll have to make the offending reflective parts black, preferably flat black, or you’ll have to use the black backing material. I found no noticeable change in fidelity when using the screen with the black backing.

Setup

The extruded aluminum frame rails are similar in quality to other frames I’ve assembled, but the angle brackets in the corner are larger and beefier than some others I’ve used, and loose-fitting the rails together with just

the angle brackets produced a properly “square” screen... meaning the four corners are all perfectly 90 degrees without you having to manipulate the rails to remove the trapezoidal shape you often get with smaller or looser-fitting angle brackets. Once the frame is assembled, it is time to install the screen fabric. Unroll it so it is reasonably centered on the frame rails. Then use one or two of the supplied plastic “spatulas” to drive the screen material into a grip rail that is molded into the frame rails. I found that a light stretch with one hand, while manipulating a spatula with the other hand, worked perfectly. This was the first time I’ve assembled a screen that is mounted in the frame this way. I was concerned that the process would be difficult or time consuming, but it worked perfectly on the first try. I didn’t need to pull any part of the screen out of the grip rail and re-install it, as I thought I might.

To keep the screen uniformly tensioned, you start in the center of the top and bottom rails and work out from the center just a little bit. Then you start in the center of the vertical sides, then go back and put a little more of the top and bottom edges of the screen into the grip rail. Then return to the sides and put a little bit more of the screen into the vertical sides of the frame. You work back and forth between top and bottom and left and right sides, always working from the center towards the corners. You want the corners loose until the very last step where you get the corners of the screen material into the grip rails.

If the black material is being installed, that can be done next. You don’t really need to secure the black material all the way around the frame rails. You can just pinch the black material into the same grip rail as the white screen material in several places on each frame rail and you’re done.

If legs are being used, they are installed last. Only two screws per leg attach the legs to the frame. Some other frames have had “nuts” that slide into the frame rails themselves, allowing the legs to be height-adjustable by sliding the “nut” up and down the frame rail until the top and bottom of the screen are at the height you want. With the S-SE frame, you specify the distance from the bottom of the screen to the floor and S-SE installs threaded inserts in the outside edges of the frame rails that match up with mounting holes in brackets on the legs. There is no height adjustment for these legs other than via additional threaded inserts that S-SE may install for you. The legs mount to the outside edge of the frame making the total width of the frame, plus legs, about four inches wider than the outside dimension of the frame.

My seating position was 8 feet from the 8-foot wide screen providing a 60-degree viewing angle. The reference theatre room has flat black walls and ceiling and black carpet between the screen and seating area. The normal center channel loudspeaker stand is 12 inches high. On top of the center loudspeaker stand, I placed a three-legged equipment stand (luckily, it was black). On top of that stand was a black high-density fiberboard shelf, then 1-inch tall brass cones. The center channel loudspeaker was placed on the brass cones. Black masking tape was applied to the forward surfaces of the brass cones to prevent reflections. This placed the center channel loudspeaker near the center of the screen left-right and top-bottom. The floor standing speakers were used both inboard and outboard of the screen to compare fidelity/sonics.

In Use

When you view images on the S-SE screen, they initially look just like images from any good screen. I’ve seen screens where you can see a stationary texture or pattern in the screen surface that’s easiest to see during vertical pans when there is white or nearly white sky in the shot. The scene moves up or down in the direction of the pan, but the pattern in the screen coating remains stationary. I find that screen artifact is very distracting. In fact, it takes me right out of the movie every time I see it. The S-SE screen doesn’t do that. As viewing hours started to accumulate, I started to feel like the screen was a bit dimmer than I was used to, but I wanted to accumulate some viewing time before doing any measurements.

Having the center channel loudspeaker in the center of the screen did produce a more convincingly centered sonic image. I can’t say it

Enlightor-4K screen material gain: 0.98 spec (0.7 measured)
 Frame cover material: black velvet
 Frame width: 3.75 inches
 Closest recommended viewing distance: none
 Screen size range: 70 inches wide to 250 inches wide; custom size quotes on request; frame rail maximum length approximately 300 inches
 Warranty – Lifetime for fixed-frame screens, 5 years for mechanical/motorized components
 MSRP - \$3,039 including shipping for model reviewed (RF96HD-4K), 8-foot wide; legs for free-standing screens optional, price on request

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was a “Wow!” moment, but it was noticeable and appreciated. It did make the presentation more cinematic. If I were going to use a screen like this permanently, I’d put a “skirt” or frame under the screen, perhaps even enclosing the screen on all four sides to produce an even more cinema-like experience. Placing the left and right loudspeakers behind the screen was less noticeable or obvious. In fact, the sound was essentially the same either way. That’s a good thing, though. You don’t want your screen messing up the sound of your main loudspeakers.

I mentioned earlier that the S-SE material doesn’t have a high-frequency roll-off like most acoustically transparent screens. Because there are no traditional holes in this fabric, sound travels through the screen material differently. There is an attenuation, but it is a relatively uniform full-range attenuation from low bass to high frequencies. That means no tonal change to the system. And it also means that a simple level change of +2 dB is all you need to make the loudspeakers sound so similar to the way they sound freestanding in the room that you can essentially forget any other equalization to tune out uneven frequency response. I did measure this effect and found it was as represented by S-SE in measurement graphs on their Web site. When the center channel loudspeaker was behind the screen, it did indeed need a +2 dB boost to match the level when it is free standing and to match the level of the left and right loudspeakers when they were outside the edges of the screen. And there was no obvious high-frequency roll-off, as you get with other types of acoustically transparent screens.

I found that images looked quite impressive, with no obvious trade-offs when the S-SE screen replaced the Elite Screens Lunette screen reviewed in the last issue. Detail was excellent, color fidelity was excellent, and overall immersion was excellent. Putting the Stewart StudioTek 100 screen back in service from time to time reinforced my feeling that the S-SE images weren’t as bright as the StudioTek 100s images. Following one of these screen swaps towards the end of the review period, I noted that the S-SE screen fabric seemed to “transmit” light within itself to a small extent. Looking for problems possibly related to that, I did see, at rare times, black levels that were higher than they should be. But this was very scene dependent and did not appear very often. It was something I never would have seen without focusing on it for long periods of time and doing split-screen comparisons.

Measurements showed that 100 percent white on the StudioTek 100 screen measured 16 foot-Lamberts (fL), while the S-SE screen managed only 9.9 fL from the same 100 percent white window pattern. With the StudioTek 100 being nominally 1.0 gain (1.08 gain by my measurements with equipment that’s not likely to be as accurate as Stewart’s measurement equipment), that means the S-SE screen’s actual gain is more like 0.7 than the specified 0.98. That makes selecting screen size and selecting a bright-enough projector critical to achieving the best results. After seeing the side-by-side comparison of the two screens with the JVC DLA-RS60 projector, it was clear that the calibrated RS60 projector was too dim for an 8-foot wide S-SE screen. You may recall that the RS60 projector was only capable of about 300, or a little more lumens when properly calibrated for 2-D content. If you want to enjoy 3-D on a low-ish gain screen, like



the S-SE, you really need a ton of light from the projector to have pleasant results, especially for 8-foot or larger screens. I found 3D with the RS60 projector and S-SE screen to be too dim to be enjoyable. Aside from being too dim, the 3-D image quality was otherwise just as good as 2-D image quality. I don't want to blame the screen too much for the 3-D brightness issue. The projector itself doesn't have any reserve luminance capability that can be called on for 3D, and 3D itself has a huge light loss penalty with eyes seeing alternate frames and the light loss in the 3-D shutter glasses.

For some, not having images fall apart when there was some light present in the room is an important screen quality. The Stewart StudioTek 100 screen (a reference material not necessarily intended for home theatre applications without fully-blacked out rooms) is very sensitive to having any light on in the room. The S-SE screen produces some degradation of images with any amount of light present in the room, but it's at an acceptable level for non-critical viewing.

Side-by-side comparison of the S-SE screen with the Stewart StudioTek 100 screen conformed some of the observations I made prior to making measurements. The Stewart screen was positioned to show the right half of projected images, with the S-SE screen showing the left half of projected images. Subjectively, about 75 percent of the time, there was little to distinguish images from the two screens from one another. I used *Blade Runner*, *The Dark Knight*, and *Casino Royale* for this evaluation phase. In dark scenes, the differences in lighting between the left side and right side of images was enough to disguise any differences in the screens. But there were a few times when it was clear that the black level of the S-SE screen was not as dark as the black level on the StudioTek 100 screen. But other times, the lower overall output of the S-SE screen made blacks look just as good or even darker than the StudioTek 100's blacks. In brightly lit scenes, again, differences in image content and lighting were often enough to disguise the fact that the S-SE's 100 percent white level was considerably down from the StudioTek 100 screen. But over time, it became clear that the S-SE screen was not as bright as the StudioTek 100 screen. During these comparisons, it was rare to observe that the S-SE screen images were lower in contrast than the StudioTek 100 images. One place I did notice the lower contrast of the S-SE screen was during the *Mecum Auto Auctions* shown on HD Theater/Velocity via DirecTV. The shiny paint and chrome against the red carpet and mostly red backgrounds just didn't have the same "pop" on the S-SE screen as was present with the StudioTek 100 screen. Keeping this issue in perspective is critical, though. You can read my comments here that point out a couple of areas that the S-SE screen is not quite the equal of the StudioTek 100 screen. But you have to remember that the StudioTek 100 screen is not acoustically transparent and is terribly fussy about the environment and external light sources. The StudioTek 100 screen is a really bad screen choice for many theatre rooms. If you can provide an appropriate environment, the StudioTek 100 is an excellent performer. The S-SE screen is more practical in the real world, has an interesting approach to the acoustically transparent conundrum, and much of the time when these two screens are side by side, you can't really say that either screen has an image quality advantage. In my book, that makes the S-SE screen pretty interesting, especially if I'm really

interested in having a very cinema-like viewing experience with all the front loudspeakers behind the screen. The performance of the S-SE screen is clearly better than acoustically transparent alternatives.

Soundwise, there was no detectable change in balance, or fidelity, or tonality. I did notice that loudspeakers behind the S-SE screen were slightly down in volume, but there was no top-end roll off or other change in sonic character. A simple boost of about 2 dB (with both the Enlightor-4K material and the black blocking material mounted in the frame) made the sound just like it was with the loudspeakers in open space. I essentially got no sonic alteration with the screen between viewers and loudspeakers.

Conclusion

The Seymour-Screen Excellence Enlightor-4K screen provided a much-improved viewing experience compared with other acoustically transparent screens experienced at shows and in home theatres. In fact, it was so good, that for the first time ever, I started to dream about a room remodel that would place the screen in a cinema-like "stage" with nothing visible but the screen. Of course those daydreams completely ignored the fact that I'm still reviewing equipment and have to move things in and out regularly, and all the electronics are behind the screen. Much of the time, image quality was indistinguishable from images on the StudioTek 100 reference screen. Though, there were times when the limitations of the S-SE screen were visible—they were never particularly objectionable, nor would they be visible without the StudioTek 100 screen side-by-side for comparison.

As with most acoustically transparent screens, you'll need a projector with some serious light output capabilities. And if 3D is to be enjoyed, even more extra light will need to be unleashed to get the "Wow!" results you want from 3D.

This might just be the screen to finally answer the prayers of those committed to acoustically transparent screens who are unhappy with other screens due to acoustic or image-quality concerns. While the images may not always equal the best reference solid-screen images, these are certainly the best images I've seen from an acoustically transparent screen so far.

Late Update

Chris Seymour of Seymour-Screen Excellence sent a last minute response that I will paraphrase here. First, Seymour wanted to make a significant point that I didn't mention in the review. He believes that almost any home theatre audio system would benefit significantly from using three identical loudspeakers across the front, something that is typically impossible with solid screens. This way the "matching" center channel loudspeaker in any given product line would be replaced with a third loudspeaker that's identical to the main left and right loudspeakers. A third loudspeaker that's an exact match for the main loudspeakers will usually have deeper bass response and, often, a better horizontal dispersion pattern than typical horizontal center channel loudspeakers, which suffer from comb filtering when the driver arrangement is the typical two mid-woofers with a tweeter centered between them. If there's already an M-TM center channel loudspeaker in the system, it can be rotated 90 degrees so the long dimension is vertical instead of horizontal, and that will also improve horizontal dispersion.

Regarding the gain specification of 0.98 versus the measured gain of 0.7, Seymour says that was strictly a marketing-driven decision to keep the Enlightor-4K material on an even playing field with other acoustically transparent screen materials that have over-stated advertised gain numbers. Independent testing of other acoustically transparent screens indicated that the Enlightor-4K material had about the same gain as other screens with advertised gains in the 1.0 to 1.16 range. My calculated value of 0.7 was a little lower than they typically measure, but Seymour had no concerns that the calculated gain was seriously in error. **WSR**