Stewart Filmscreen's StudioTek 100 vs. Da-Lite's JKP Affinity Screen Challenge

Following the publication of this Editor's Couch column in Issue 142, September, I received an e-mail from Joe Kane (which follows) in reference to my editorial about the Stewart Filmscreen StudioTek 100 versus the Da-Lite JKP Affinity screen.

I was also provided a separate communication regarding my editorial by a third party (I was not sent the communication directly from the author), which was in the form of a press release entitled "Letter To The Home Theater Industry." This release was authored by the Da-Lite Screen Company under the direction of its Chairman and CEO, Richard E. Lundin, in which he accuses *Widescreen Review* of "intentionally" misrepresenting Da-Lite's products.

I will respond to both communications and offer a challenge to Da-Lite (and Stewart Filmscreen).

First the Joe Kane letter:
From: Joseph Kane
Organization: Joe Kane Productions
Date: Wed, 09 Sep 2009

To: "Reber, Gary" <editor-gary@widescreenreview.com>
Subject: Da-Lite versus Stewart Screen

Hi Gary,

Reference your editorial in *Widescreen Review* about the Stewart versus the Da-Lite screen.

After reading it I'm tempted to make multiple comments but I'll limit this response to just one. The Da-Lite Affinity screen at Stewart Filmscreen is defective. What you saw was one of the first screens to go out of the factory. The packaging had introduced variations in the screen we hadn't anticipated. The problem was quickly fixed.

When I saw the screen I immediately offered to replace it, as I would have if it had shown up in any application. Representation from Stewart Filmscreen refused to allow me to replace the screen.

Your assessment is based on a Da-Lite screen that does not represent what we are doing day in and day out. I'm sorry Stewart represented it to you as what Da-Lite is currently delivering.

I invite you to attend my demonstrations so in the future you will know for yourself that the Da-Lite Affinity screen is far better than you credit in this editorial.

Respectfully submitted,

Joe Kane joekane@att.net

Editor-In-Chief and Publisher Gary Reber Comments: As you know our association has extended over 16 years and I have always valued your views and passion for "the best that it can be" in a home theatre experience. You have been one of this industry's strongest proponents for non-compromised performance, and I have always applauded your passion and advocacy, which has been testified by countless articles authored by you in Widescreen Review *over the years and your participation as a presenter in the Technology Conference At Sea™ on every Home Theater Cruise™ outing. You have been a teacher and a great friend during our long association.*

As you know I have personally witnessed countless demonstrations that you have conducted over the years, including demonstrations of your JKP Affinity Screen at the Custom Electronic and Design Installation Association (CEDIA) Expo and the Consumer Electronics Show (CES). As to be expected, your presentations have been flawless and performance impressive.

The Affinity Screen I viewed and reported on in my last editorial was, in fact, a dealer-ordered screen for end-user purchase. As I noted in my editorial I suspected that the Affinity Screen I observed during a press junket to Stewart Filmscreen exhibited a manufacturing defect: "Noticeably was a strange vertical line structure and slightly visible hot spotting in the Affinity Screen, which was completely absent in the StudioTek 100 material (I presume an artifact of the Da-Lite manufacturing process)."

Others also commented that the vertical line structure was abnormal and possibly a defect. However, the other performance aspects remained a truism, that is: "While the .9 gain JKP Affinity Screen exhibited excellent reference picture quality, the slightly tinted gray screen revealed less-than-ideal corner-to-corner white-field uniformity and white light brightness that wasn't apparent when viewed on the 1.0 gain StudioTek 100 screen, using the same projector. The

StudioTek 100's white-field uniformity was absolutely superb, as was the virtually perfect color balance. The light reflection off the StudioTek 100 was impressively even and smooth from any viewing angle."

(Footnote: A typo in the original editorial had the stated gain at .09. The gain is actually .9.)

Following this viewing I had another opportunity to study another dealer-purchased Affinity Screen and that screen exhibited similar less-than-ideal corner-to-corner white-field uniformity absent the strange vertical line structure.

I have subsequently become aware of two other published reviews on the Affinity screen, one from reviewer Brent Butterworth in Sound & Vision *magazine (www.soundandvision mag.com/features/3185/private screening)* and the other from reviewers Bill Livolsi and Evan Powell on Projector Central *(www.projector central.com/ stewart_studiotek_ 100.htm)*. Reviewer Jeremy R. Kipnis wrote a review of the Stewart StudioTek 100 on the Home Theater Review.com *(www.hometheaterreview.com/stewart-filmscreen-stu-diotek-100-screen-material-reviewed/)* Web site. All three reviews confirm my findings. Furthermore, in the case of Sound & Vision and Projector Central, the Affinity Screens reviewed were individually obtained by them and were not the Affinity Screens I saw at Stewart and another location. I further have received confirming reports from others noting uniformity variances in dealer-purchased Affinity Screens and praising the Stewart StudioTek 100's superb white-field uniformity and virtually perfect color balance. With Da-Lite's attempt in putting out a product of this high reference stature—and with the JKP logo on it—without the quality control it deserves, is a direct insult to you, Joe Kane Productions, and your credible volume of work over the years.

The conclusion I have come to is that perhaps there was a production run of the Affinity Screen material that does not reflect the intended performance specification. This is purely conjecture on my part. But I have not heard or have been advised that a recall of these defective screens has been formally offered.

Now for the second communication, which attacks *Widescreen Review's* and my own personal integrity.

Letter To The Home Theater Industry

WARSAW, IN—September 15, 2009—In a day and age of less than honest political rhetoric, it has been comforting to know that the companies in the audio visual industry have stayed above the fray. Now, it seems that some in our industry have lost their moral compass and journalistic integrity.

When did it become acceptable to publish propaganda masquerading as editorial? When did copy and paste journalism begin substituting for honest reporting? When did the word new become a synonym for badge-engineering or simple re-branding? When were the words 'long association' meant you spoke with someone once upon a time? When did subjective opinion-based adjectives start sufficing for real objectivity and fact-based measurement? When did non-certified projection screen materials contribute to any LEED rated project? When did editors begin publishing manufacturer-based press releases as editorials?

Da-Lite knows. It started this year. "When erroneous information has been published in the past about our company, I've always turned the other cheek," stated Richard E. Lundin, Da-Lite Screen Company Chairman and CEO. "However, there comes a time when you have to stand up for your company, your people and your products. Such a time is now for Da-Lite. When our products are intentionally misrepresented by a competitor and these misrepresentations

are then put in print by an industry magazine, it is time to express our extreme disappointment in both."

Da-Lite has a 100-year heritage of product innovation, industry leadership and fair play. The company thrives on competition and a good fight in the marketplace, but there is no room for poor business ethics and shoddy reporting in the audio visual industry. "I want to go on the record that Da-Lite will always protect our investment in our people and our products," continued Lundin. "To this end, we request a complete retraction of the "Editor's Couch" in the current issue of *Widescreen Review* (#142) and that any future product comparison be performed in an objective third-party location, rather than in our competitor's factory."

Da-Lite Screen Company is the manufacturer of the exclusive line of Joe Kane's JKP Affinity Screen series, the only projection screen material designed for high-definition video 1080p projectors.

Editor-In-Chief and Publisher Gary Reber Comments: The Da-Lite Screen Company has issued a character assassination and indirect slander aimed at Widescreen Review *and to me personally with the distribution of their "Letter To The Home Theater Industry." Essentially Da-Lite has accused* Widescreen Review *of losing our "moral compass and journalistic integrity." If that is the case then every other reviewer who has written critically about the performance attributes of the new JKP Affinity Screen compared to the Stewart StudioTek 100 screen has lost their "moral compass and journalistic integrity."*

My screen comparison editorial was not malicious. Sometimes the truth hurts but in reality reviews assist companies who appreciate the truth so that they can improve their product. I believe that the winning attitude, when challenged by a negative review, should be for the company to show appreciation for bringing the problem or deficiency to its attention and to act on criticism to improve in the future.

Widescreen Review *has been publishing leading-edge editorial and technology articles for 18 years. Back in 1998, we published a 388-page special edition entitled "Imaging Science Theatre 2000" when Joe Kane was our Video Technical Contributing Editor and a major contributor to this edition. As well, Da-Lite's Dr. Richard Burrows was a contributor and we published therein a 56-page series entitled "Angles Of View" written by Da-Lite's M.K. Milliken, Jr. "IST 2000" remains an incredible test book on imaging science, including screen technology.*

Da-Lite reduces our "long association" with Joe Kane as meaning "you spoke with someone once upon a time." In this regard the Da-Lite company is completely ignorant of the fact that Joe Kane has been associated with Widescreen Review *as a Contributing Editor for upwards of 16 years and during that time has authored countless articles which have been published in the magazine. Joe's latest article was entitled "Component Video," which was published in Issue 138, January/February 2009. Joe has written a new article entitled "Projection Screen Update," which is published on the* WSR *Web site.*

The Da-Lite Screen Company even slights the Leadership in Energy and Environmental Design (LEED®) for Homes "extreme green" national showcase home when they state "When did non-certified projection screen materials contribute to any LEED rated project?" I designed this showcase home, which is now under construction at The Sea Ranch in Northern Sonoma County, California (www.ultimatehomedesign.com/oph-ibeam.php). This project also is a CEDIA Electronic Lifestyle showcase. Perhaps, Da-Lite should direct their question to CEDIA. From my perspective, this home is designed to showcase "the best that it can be" in performance high-definition video and 7.1-channel surround audio. I was a panelist on a three-hour educational seminar during the CEDIA Expo 2009 in which I discussed the "extreme green" and "electronics applications" in the home.

The statement that really caught my attention was "Da-Lite Screen Company is the manufacturer of the exclusive line of Joe Kane's JKP Affinity Screen series, the only projection screen material designed for high-definition video 1080p projectors." This statement blatantly implies that no other screen manufacturer's material is comparable to or is capable of resolving high-definition video projected by 1080p projectors. I am certain that other reputable screen manufacturers will dispute this claim. I can attest to the fact that there are manufacturers of competing screen material that produce excellent 1080p performance screens, both designed for front projection (including acoustically transparent front projection) and rear projection.

It is apparent that the Da-Lite Screen Company today has limited knowledge of Widescreen Review's very long history of advocating projection as the ultimate display technology. And as I stated in my previous editorial, along with the projector is the necessity of accurate screen material to mate with the projector. We have been an advocate for low-gain screens, neutral color screens where all colors of light would be reflected equally, and screens whose surface structure would not interfere or in any way reduce the detail found in high-definition content.

I am not about to comply with Mr. Lundin's request for "a complete retraction of the 'Editor's Couch'" in the last issue. I stand by my assessment as I am sure others who have similarly reported will. I will issue this challenge, or should I say reciprocate the Da-Lite advertisement which contains the quote from Joe Kane, "I challenged Da-Lite, now I'm challenging you," which is to propose a public shoot-out between the JKP Affinity Screen and the Stewart StudioTek 100 screen.

I suggest a neutral venue, with ideally absolute black room levels. Da-Lite would provide one screen, Stewart a second. And one more of each would be sourced from independent dealers. Da-Lite and Stewart Filmscreen should be present, Joe Kane should be present, invited members of the videophile community should be present, and, of course, I will also be present. Using a jointly accepted projector, test content, and test equipment, we would evaluate all screens, with Widescreen Review publishing the results.

Should the outcome award the performance advantage in white-field uniformity and color balance to Da-Lite's JKP Affinity Screen, then I will acknowledge so. And I will publish the results of the shoot-out in Widescreen Review.

Now the criteria for the shoot-out testing must follow acceptable screen performance evaluation methods. I inquired about such testing methods and Gary Browning, Manager R&D at Stewart Filmscreen complied with the following test procedures and environmental conditions. I invite the Da-Lite Screen Company to submit your screen performance evaluation methods so that no step is missed in the shoot-out test.

We will arrange for an independent facility for the shoot-out testing and invite industry professionals with expertise in screen evaluation to serve as judges.

Both Da-Lite and Stewart will be required to submit an identical-sized screen, one comprised of the JKP Affinity Screen material and the other the StudioTek 100 screen material. Additionally, Widescreen Review will act as a "mystery shopper" and acquire an identical-sized screen from a Da-Lite dealer and a screen from a Stewart Filmscreen dealer, unbeknown to either screen company. This will assure that "the golden screen" factor is removed from the shoot-out testing.

I will look for a favorable response to participating in this screen shoot-out test from the Da-Lite Screen Company and Stewart Filmscreen, and will publish the letters accepting the challenge.

This exercise should settle the issue and serve as a valued educational experiment for our readers throughout the industry, both end-user serious enthusiasts and the trade. **WSR**

Evaluation Parameters

Equipment

- Projection screen to be tested.
- Projector with 1.8 lens or longer throw distance.
- Photometer with spectral luminance response of the standard observer with photopic vision as defined in CIE S002. The acceptance angle of the meter needs to be 2° or less.
- Minolta LS100 or LS110 are acceptable.
- Reflectance standard similar to a Lambertian diffuser that reflects all incident light, so that luminance is the same regardless of the angle of view. The standard could be magnesium oxide (MgO), barium sulfate (BaSO4), magnesium carbonate (MgCO3), Spectralon, or other matte white surface that has been calibrated to verify reflectivity.
- Regulated power supply with ability to maintain the projector specified voltage ±1%. This is important because a 1 percent change in voltage equates to approximately 4 percent change in light output from the projection lamp.
  Tripod for the photometer.
- Laser Protractor or other angle-measuring device.
Masking tape or equal.
- Measuring tape.
- Calculator.
- Signal source for the projector and test patterns: Full field white and ANSI checkerboard pattern.

Environment

- The area where the screen is to be tested needs to have complete control of ambient light.
- If possible the walls should be painted or covered with a light-absorbing material to minimize stray light reflection. Those conducting the test should also wear dark clothing.
- With the projector off, ambient light measured off the screen should be 0.01 fl or less.

Gain Measurement

- 1) Set up the projector and screen so that the projector is as close to the perpendicular centerline of the screen surface as possible. The throw distance to fill the screen should be at least 1.8 x screen width.
- 2) Connect the projector to the voltage regulator, turn it on, and let it warm up for at least 30 minutes. This time is needed for the bulb to stabilize its light output.
- 3) Display a full-field white (100 IRE) pattern.
- 4) Place or have someone hold the reflectance standard on the center of the screen.

• From directly behind the projector, as close to the optical axis as possible, target the standard with the photometer and read the luminance. The standard should be flat against the screen and its surface perpendicular to the projection light. If the active area of the spot meter area is not well within the standard's reflective area, move closer until it is slightly off axis, as not to occlude the projector light on the standard.

• 5) Next remove the standard and read the luminance off the projection screen in the same spot.

• 6) Divide the luminance from the screen by the luminance from the standard to get the screen gain. Gain = Luminance of screen / Luminance of standard

Half-Gain Angle

• 1) Keep the same setup as above.

• 2) Using a tab of tape, mark the center area of the screen

• 3) With the tape as a reference mark, move the meter in an arc around the screen while reading the meter, until the value is half of the maximum luminance reading. Make sure the active area of the spot meter is reading luminance from the screen and not the reference tape.

• 4) Mark the floor with tape and using the protractor from the screen center, read the half-gain viewing angle from screen center line to the tape mark.

Uniformity

• 1) Keep the same setup as above.

• 2) Using a tab of tape, mark each corner area of the screen. Measure in from each edge about 5 percent of the screen's width. You should now have five areas marked on the screen. Center and each corner.

• 3) From the same location as when measuring the maximum gain, put up the reflectance standard on a marked screen area and take a luminance reading. Record the value and its location. i.e., center, top left, top right, etc.

• 4) Remove the reflectance standard and measure the luminance from the screen area underneath. Record the value and its location.

5) Repeat for each location, recording the luminance from the standard and the screen for each of the five locations.

6) Determine the gain of each location.

7) Luminance readings from the corners should be within 75 percent to 90 percent of the center area.

Contrast

• 1) Put up the ANSI checkerboard test pattern and measure luminance from a centered viewing area the center of each square.

• 2) Record the readings for all the white areas and all the black areas.

• 3) Average the luminance values of the white squares and divide by the average luminance of the black squares. That will yield the effective contrast ratio of the display in that environment. Contrast Ratio = Luminance max / Luminance min

Ambient Light Rejection

• 1) Keeping the same setup as with ANSI contrast measurement, blank the projector or cover up the lens. Do not turn off.

2) Turn on some room lights to simulate ambient light in a room. Try not to have any light sources wash directly on the screen.

3) Measure the ambient light falling on the screen surface by measuring the reflectance standard placed on the screen. This will yield the amount of illuminance in footcandles falling on the screen surface. If you have an illuminance meter available you can also use that.

• 4) Unblank the projector and repeat the contrast measurement (Items 2 and 3) as above. This will yield a new contrast ratio of the display in ambient light conditions. Higher gain, more directional screens, and tinted screens perform better in ambient light than matte white screens.

Definitions

• Gain is the ratio of the luminance or light reflected from a screen material to that reflected from a Lambertian reflectance standard under the same viewing conditions and viewing angle. The gain of a rear-projection screen is the ratio of the light refracted by a screen material to that reflected by the standard.

• Gain = Luminance of screen / Luminance of standard

• Half-gain angle is the angle where the luminance value is half of the maximum luminance value measured from a centerline perpendicular to the screen surface along a horizontal plane.

• Contrast ratio is the ratio of the maximum luminance value over the minimum luminance value of a projection display.

• Contrast Ratio = Luminance max / Luminance min

• Uniformity is a comparison of the luminance of the screen viewing surface from center to edge under the same viewing conditions and viewing angle.