Chauvet Professional Ovation E-910FC

By: Mike Wood

Figure 1: Fixture as tested.

About a year ago, we took a look at Chauvet Professional's first entry into the LED profile spot market, the Ovation ED-190WW. This month, we examine the color version in the Ovation family, the Ovation E-910FC. The styling is similar, but this time with a five-color LED light engine. The results presented here are based on the testing, with the fixture operating on a nominal 115V 60Hz supply, of a single Ovation E-910FC unit supplied to me by Chauvet (Figure 1).

Light source

The Ovation E-910FC uses a hexagonal array of 90 LEDs in five colors, red, green, blue, amber, and lime. There are 18 emitters for each color, apart from blue, which has 19. Figure 2 offers a view into the lens, showing the LED array and the surrounding hexagonal mirror tube array that serves to homogenize the colors. Each LED has its own primary optic feeding into the long hexagonal tube, which, in turn,

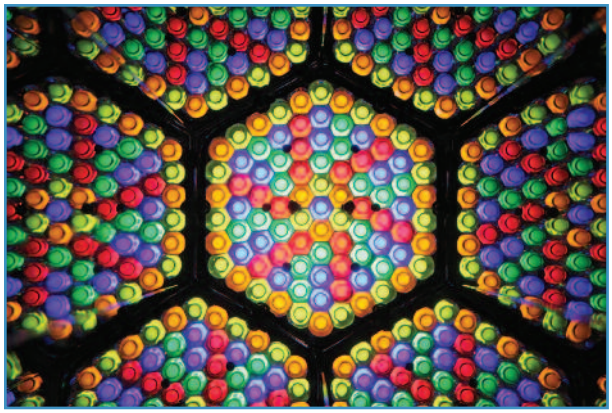

Figure 2: LED layout and homogenizer.

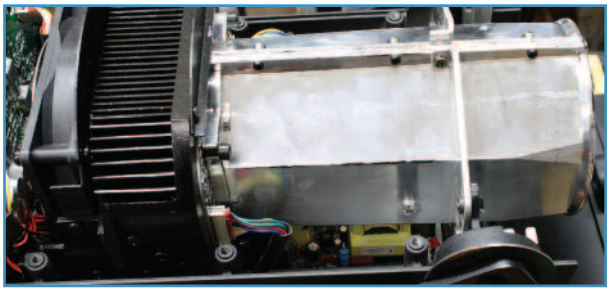

Figure 3: Integrating tube.

has a second field lens at its output. Figure 3 shows the layout of the mixing tube with the LEDs on the left.

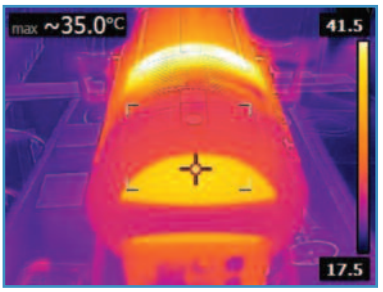

Figure 4: Thermal.

The LED board is attached to a large finned heat sink with a fan (also visible in Figure 3) drawing air through and away. Finally, layered behind all this at the rear of the unit are the driver and display electronics. The main power supply is mounted underneath the tube. As with the Ovation ED-190WW, the fan is temperature-controlled and the Ovation provides the option to run it all the time or in auto mode. I ran all tests in auto fan mode. Figure 4 shows a thermal camera view of the fixture after running at full output for 30 minutes. Most of the heat, as expected, is immediately behind the LEDs.

Dimming

The Ovation E-910FC offers a choice of options for control. I ran the unit with 16-bit control on all five LED channels through DMX512. Further options are provided through the menu system for dimmer curve and speed; here I used the default settings to achieve the result shown in Figure 5. When controlled from DMX512, the dimming was smooth and clean, with a dimming curve that is a very good match for a standard square law curve. The various options for dimmer speed allow the unit to emulate the thermal lag of an incandescent lamp.

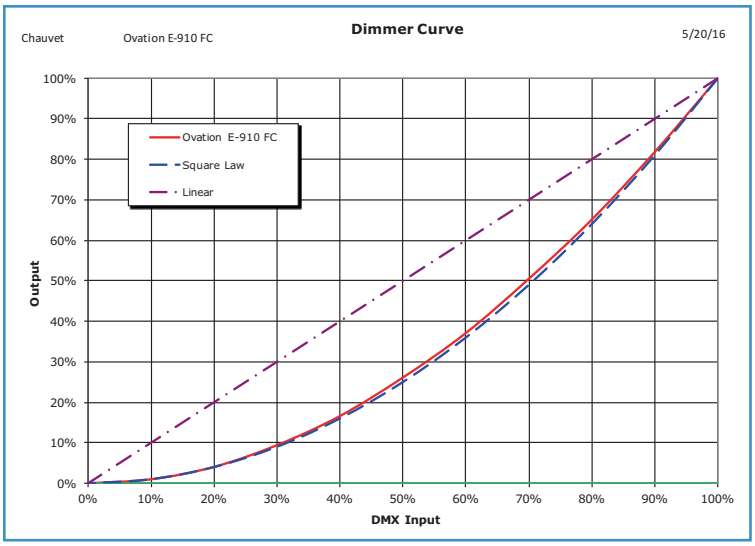

Figure 5: Dimmer curve.

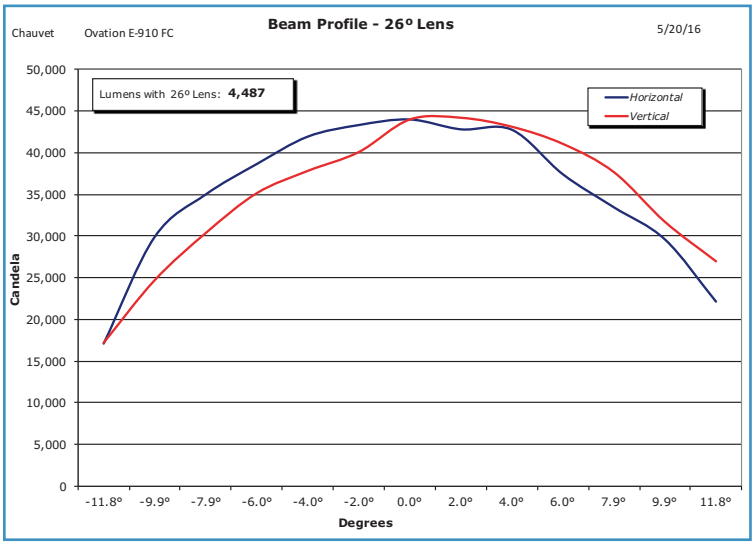

Figure 6: Output.

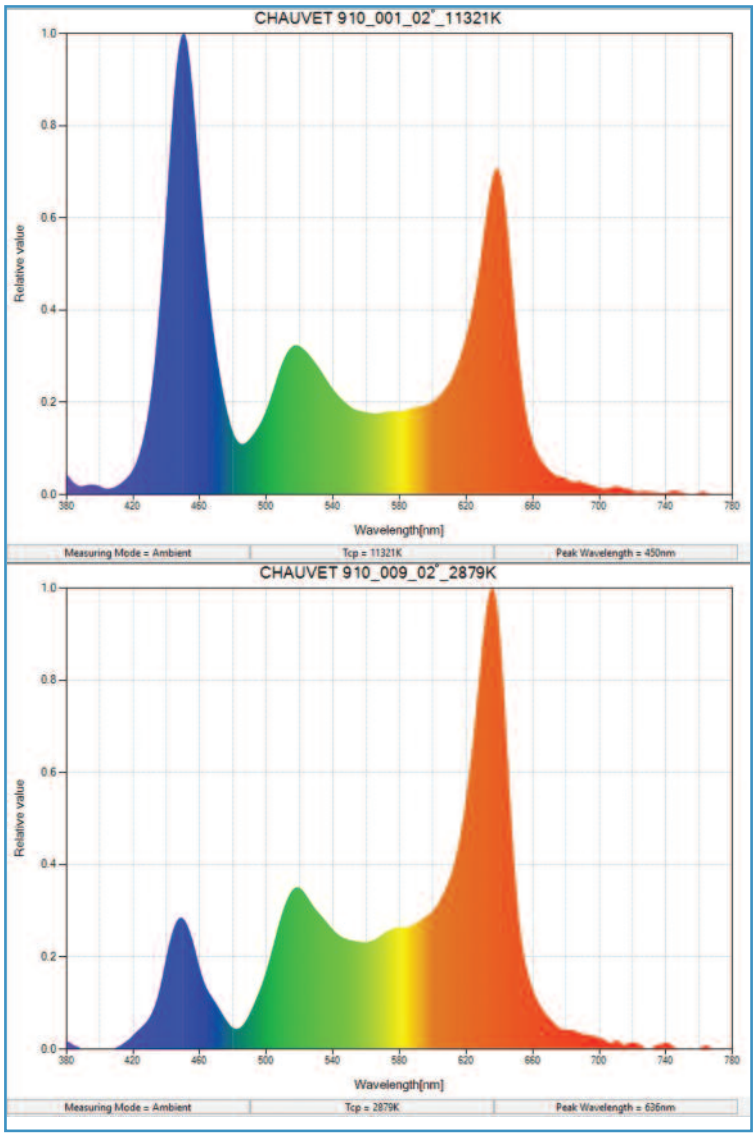

Figure 7: Spectral curves.

Output

As with the Ovation ED-190WW, the E-910FC uses standard changeable ellipsoidal lens tubes, offering a range of output angles. These offer manual shutters and accessory slots for gobos and color frames—although, in this case, with a full color-mixing unit the color frame is more likely to be used for diffusion rather than color. For my tests, I used the 26° lens (as I did with the ED-190WW last year); all results are reported with that lens fitted. At full output with all colors running at maximum, I measured 4,500 lumens at a field angle of just under 24°(Figure 6). The output is very flat, which is good for gobo projection, but a little tricky for blending adjacent units.

Whites

The color with all emitters at full is somewhat pink but, by pulling back just the red emitter, I was able to get back to the black body curve at 17,500K with very little reduction in output. This is effectively the brightest white the unit can produce. The table below shows the measured results for the pre-specified white color points that Chauvet offers in the fixture through the virtual color wheel channel. The measured color rendering metrics at 3,200K were: TM-30 Rf of 83, TM-30 Rg of 115, TLCI 68, CRI 77. (Note: I highly recommend using TM-30 instead of CRI to judge color rendering, particularly with LED sources. CRI can give wildly incorrect values with narrow band sources.) A TM-30 Rf of 83 is a reasonable result and the TM-30 Rg value of 115 shows that the unit oversaturates some colors. In this case, reds and greens were somewhat over-saturated. The color rendering varied across the color temperature range, with the higher color temperatures providing better rendering in general. This is primarily because of the lack of deep red for the lower color temperatures. Figure 7 shows the spectra at the extremes.

SPECIFIED COLOR TEMPERATURE	MEASURED COLOR TEMPERATURE
2,800K	2,744K
3,200K	3,167K
3,500K	3,493K
4,000K	4,054K
4,500K	4,631K
5,000K	5,209K
5,600K	5,960K
6,000K	6,381K
6,500K	6,909K

Thermal droop was quite low; I measured a drop from 100% output to 90% in 30 minutes at full power.

Color

Color mixing from a five-color system using amber and lime on top of the usual RGB is a great improvement. As you know if you've read prior reviews, I'm not a great believer in RGB alone. It's okay for lighting backings and effects use, but, in my opinion, never looks that great on skin tones. The lack of cyan and magenta and the narrow spikes always make the result look a bit cartoonish. Lime is the great addition that a number of manufacturers have put into their mixes in recent years. First developed by Philips for use in its Hue domestic color-changing lamps in 2014, it's now finding its way into an increasing number of entertainment lighting products. It's a blue, pumped, broad-phosphor LED designed to address precisely the problem of maximizing efficacy and improving color.

Figure 8 shows the SPD (spectral power distribution) of a lime LED superimposed over the top of the photopic curve (both the old familiar CIE 1924, and the new E1.48) to show you how good a fit it is. It peaks at just over 560nm, right about where the human eye is most sensitive, and follows the photopic curve very closely either side. In other words, lime (and the similar mint from Osram) is an LED designed to be as efficacious as possible. A perfect match to the human eye response is as good as you can get when you want to make visible light. As far as theatre is concerned, lime helps a lot when trying to mix good pastels, particularly the pale blue and yellow tints beloved of lighting designers. The measured output contribution from each emitter was as follows:

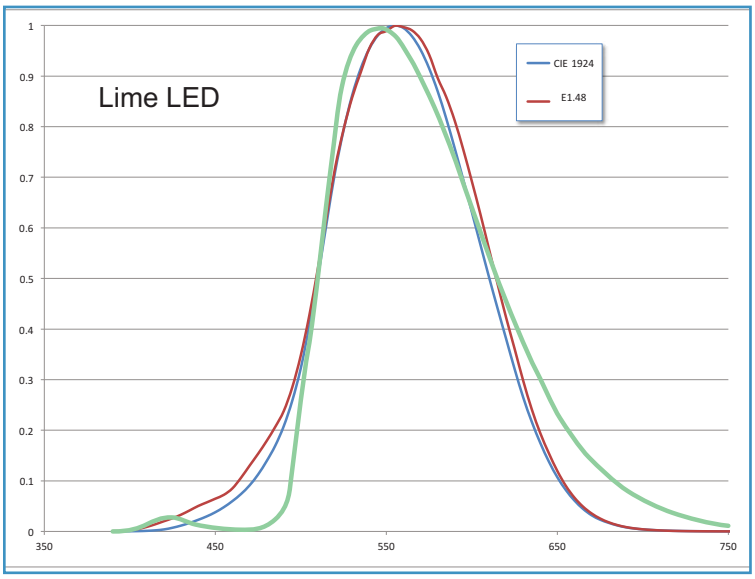

Figure 8: Lime vs V(Lambda).

COLORS					
Color	Red	Green	Blue	Amber	Lime
Transmission	17%	21%	4.7%	19%	40%

One difficulty from having all those colors, of course, is trying to mix them into a single homogenized beam. Ovation has done a pretty good job with the mixing tube; however, there is still some color variation visible across the beam and some colored shadows. Figures 9 and 10 show the front lens and a cyc with a single vertical pipe to cast shadows.

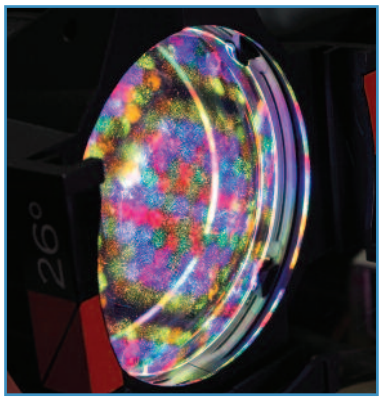

Figure 9: Front lens.

Figure 10: Colored shadows.

Noise

The cooling fan is the only noise source. I measured 37.4dBA at 1m when run in full power with the fan in auto mode.

Electrical parameters

I measured power consumption with the LEDs at full power at 1.82A from a nominal 115V 60Hz supply. Power was 218W, 220VA, with a power factor of 0.99. Quiescent consumption with the LEDs off was 0.13A, 8W, 16VA at a power factor of 0.5.

Figure 11: Rear panel.

Construction and electronics

As with its siblings, the Chauvet Ovation E-910FC is styled like a familiar theatrical luminaire, featuring black die-cast aluminum and a manual yoke. The rear panel of the unit, shown in Figure 11, has both five-pin XLR DMX connectors and three-pin data connectors as well as powerCON in and out to allow daisy-chaining units. The menu system through the LCD panel allows local control, choice of the DMX-512 or dimmer control modes, as well as self-test and configuration options. The unit also offers RDM and a range of preset colors for stand-alone operation along with quick access to a "focus" mode where the light turns on full, overriding DMX-512, for focusing. There is a virtual color wheel channel offering a range of pre-mixed gel colors but you can always mix your own using the five colors.

That about covers it for the Chauvet Professional E-910FC. I hope I've given you enough information to decide if you should try it out for yourself.

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