LM-79 Test Report

Relevant Standards

IES LM-79-2008
IES TM-30-2015
CIE 13.3-1995

Product SKU

FLUID VIEW® 24V LED Tape Light DI-24V-FV42-90**

Test Conditions

Test Temperature: 25.2 °C
Luminaire Sample Length: 12.00 in.
Power Supply: Agilent E3634A DC Power Supply
Voltage: 24 VDC
Current: 0.057 A
Power Consumption: 1.37 W

Test Date

8/19/2016

Prepared By

Micah Corson, Product Engineer

Approved By

Wes Buck, Compliance Manager

The results contained in this report pertain only to the tested sample.
Photometric & Colorimetry data measured in accordance to IES LM-79-2008 standards, at the Elemental LED, Inc. Innovation Lab.
### SUMMARY OF RESULTS

<table>
<thead>
<tr>
<th>Metric</th>
<th>Test</th>
<th>Reference</th>
<th>Notes</th>
<th>Metric</th>
<th>Test</th>
<th>Reference</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_f$</td>
<td>89</td>
<td>100</td>
<td>IES TM-30-15 Fidelity Index</td>
<td>$CCT$</td>
<td>4096</td>
<td>4096</td>
<td>Correlated Color Temperature</td>
</tr>
<tr>
<td>$R_g$</td>
<td>99</td>
<td>100</td>
<td>IES TM-30-15 Gamut Index</td>
<td>$D_{uv}$</td>
<td>-0.0008</td>
<td>0.0000</td>
<td>Distance from the blackbody locus</td>
</tr>
<tr>
<td>$R_a\ (CRI)$</td>
<td>93</td>
<td>100</td>
<td>CIE Test Color Method General Index</td>
<td>$x$</td>
<td>0.3758</td>
<td>0.3763</td>
<td>CIE 1931 chromaticity coordinate</td>
</tr>
<tr>
<td>$R_g$</td>
<td>68</td>
<td>100</td>
<td>CIE Test Color Method Sample Nine Score</td>
<td>$y$</td>
<td>0.3721</td>
<td>0.3742</td>
<td>CIE 1931 chromaticity coordinate</td>
</tr>
<tr>
<td>LER</td>
<td>288</td>
<td>192</td>
<td>Luminous Efficacy of Radiation</td>
<td>$u$</td>
<td>0.2239</td>
<td>0.2234</td>
<td>CIE 1960 chromaticity coordinate</td>
</tr>
<tr>
<td>Lumens</td>
<td>115</td>
<td>1852</td>
<td>Luminous Flux</td>
<td>$v$</td>
<td>0.3325</td>
<td>0.3332</td>
<td>CIE 1960 chromaticity coordinate</td>
</tr>
<tr>
<td>$R_{f,\text{skin}}$</td>
<td>94</td>
<td>100</td>
<td>Average of CES15 and CES18 (skin)</td>
<td>$u'$</td>
<td>0.2239</td>
<td>0.2234</td>
<td>CIE 1976 chromaticity coordinate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$v'$</td>
<td>0.4988</td>
<td>0.4998</td>
<td>CIE 1976 chromaticity coordinate</td>
</tr>
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</table>

### SOURCE PROPERTIES

#### GENERAL COLOR RENDITION

<table>
<thead>
<tr>
<th>$R_1$</th>
<th>$R_2$</th>
<th>$R_3$</th>
<th>$R_4$</th>
<th>$R_5$</th>
<th>$R_6$</th>
<th>$R_7$</th>
<th>$R_8$</th>
<th>$R_9$</th>
<th>$R_{10}$</th>
<th>$R_{11}$</th>
<th>$R_{12}$</th>
<th>$R_{13}$</th>
<th>$R_{14}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>92.9</td>
<td>95.3</td>
<td>95.4</td>
<td>92.4</td>
<td>91.8</td>
<td>91.5</td>
<td>94.6</td>
<td>87.2</td>
<td>87.4</td>
<td>91.9</td>
<td>71.2</td>
<td>93.7</td>
<td>97.1</td>
<td></td>
</tr>
</tbody>
</table>

#### SOURCE CHROMATICITY COMPARISON

This chart plots the chromaticity of the test and reference sources in the CIE 1931 chromaticity diagram.

#### SPECTRAL POWER DISTRIBUTION COMPARISON

This chart displays the spectral power distributions for the test and reference source. Each SPD has been normalized so that the maximum values is 100%.

#### CES CHROMATICITY COMPARISON

This plot shows the shift in chromaticity for each individual CES.

#### COLOR VECTOR GRAPHIC

This plot shows the $R_f$ and $R_g$ values relative to possible values.
COLOR SAMPLE COMPARISON (APPROXIMATION)

NOTE: CES stands for "Color Evaluation Sample", these 99 samples are used in place of the 16 R values. The colors shown are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately. For each sample, the color on the left represents the reference source, and the color on the right represents the test source.

Sample Type:
A - Nature
B - Skin
C - Textiles
D - Paints

<table>
<thead>
<tr>
<th>Type</th>
<th>Elemental</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><img src="image1" alt="Sample A" /></td>
<td><img src="image2" alt="Sample A" /></td>
</tr>
<tr>
<td>B</td>
<td><img src="image3" alt="Sample B" /></td>
<td><img src="image4" alt="Sample B" /></td>
</tr>
<tr>
<td>C</td>
<td><img src="image5" alt="Sample C" /></td>
<td><img src="image6" alt="Sample C" /></td>
</tr>
<tr>
<td>D</td>
<td><img src="image7" alt="Sample D" /></td>
<td><img src="image8" alt="Sample D" /></td>
</tr>
</tbody>
</table>
COLOR RENDITION BY HUE

This chart displays the average Fidelity Index for all samples within the hue bin. The number of samples per bin, which can vary based on the CCT used for the calculation, is shown at the top. The color of the bar is based on the average chromaticity under the 5000 K reference illuminant; the colors may not display accurately depending on the calibration of the monitor, and should be used for orientation only.

COLOR FIDELITY BY SAMPLE

This chart displays the Fidelity Index for each of the 99 CES. The CES are arranged by their hue angle under the 5000 K reference source, which was also used to determine the color of each bar. The colors are approximate and depend on proper monitor calibration. Some colors may be outside of the gamut of the monitor, and will not be displayed accurately.
Goniophotometer Test

SUMMARY OF RESULTS

Luminaire: FLUID VIEW® 24V LED Tape Light
SKU: DI-24V-FV42-90**
Luminous Flux: 119.73 Lumens
Power Consumption: 1.37 Watts
Efficacy: 87.39 Lumens/Watt
Spacing Criterion (0-180): 1.28
Spacing Criterion (90-270): 1.28

*Graphs below are for reference, full IES files are available on Diode LED website*

DISTRIBUTION CHARTS AND TABLES

**Zonal Lumen Data**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Lumens</th>
<th>%Luminaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>14.97</td>
<td>12.50</td>
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<tr>
<td>0-30</td>
<td>31.92</td>
<td>26.70</td>
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<tr>
<td>0-40</td>
<td>52.52</td>
<td>43.90</td>
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<tr>
<td>0-60</td>
<td>93.58</td>
<td>78.20</td>
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<tr>
<td>0-80</td>
<td>117.06</td>
<td>97.80</td>
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<tr>
<td>0-90</td>
<td>119.73</td>
<td>100.00</td>
</tr>
<tr>
<td>20-40</td>
<td>37.55</td>
<td>31.40</td>
</tr>
<tr>
<td>20-50</td>
<td>59.07</td>
<td>49.30</td>
</tr>
<tr>
<td>40-70</td>
<td>55.93</td>
<td>46.70</td>
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<tr>
<td>60-80</td>
<td>23.48</td>
<td>19.60</td>
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<tr>
<td>70-80</td>
<td>8.60</td>
<td>7.20</td>
</tr>
<tr>
<td>80-90</td>
<td>2.67</td>
<td>2.20</td>
</tr>
<tr>
<td>90-180</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>0-180</td>
<td>119.73</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Polar Candela Distribution**

**Illuminance at a Distance**

- Center Beam fc
- Beam Width
- 1.5 ft: 18.1 fc, 4.7 ft
- 3.0 ft: 4.53 fc, 9.4 ft
- 4.5 ft: 2.01 fc, 14.0 ft
- 6.0 ft: 1.13 fc, 18.7 ft
- 7.5 ft: 0.72 fc, 23.4 ft
- 9.0 ft: 0.50 fc, 28.1 ft

Vert. Spread: 114.1°
Horiz. Spread: 114.6°

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