

# Report of Test LLI-17138-2

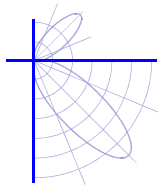
Leotek Electronics - Wall pack luminaire. Product ID: ES2-88H-MV-NW-W-DB-450  
Brown painted cast aluminum housing with specular reflectors and prismaic clear plastic lens.  
88 LEDs in 22 x 4 array with sheets of clear plastic individual lenses.  
One Inventronics LED Driver. Model: EUD-200S490DT  
Operating at 120 VAC and 60 Hz with dimming attached to switch set to "1".



## Performance Summary

Total Light Output	14297 lm	Min Power Factor	0.89 @ 277 V
Luminaire Power	130.0 W	Max THD(i)*	12.0 % @ 277 V
Luminous Efficacy	110.0 lm/W		
CCT	3930 K		
CIE(x,y) 1931	(0.387, 0.388)	Bug Rating	B3-U0-G2
CRI	72		

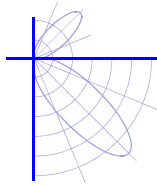
**PREPARED FOR : Leotek Electronics USA Corp, San Jose CA 95131.**



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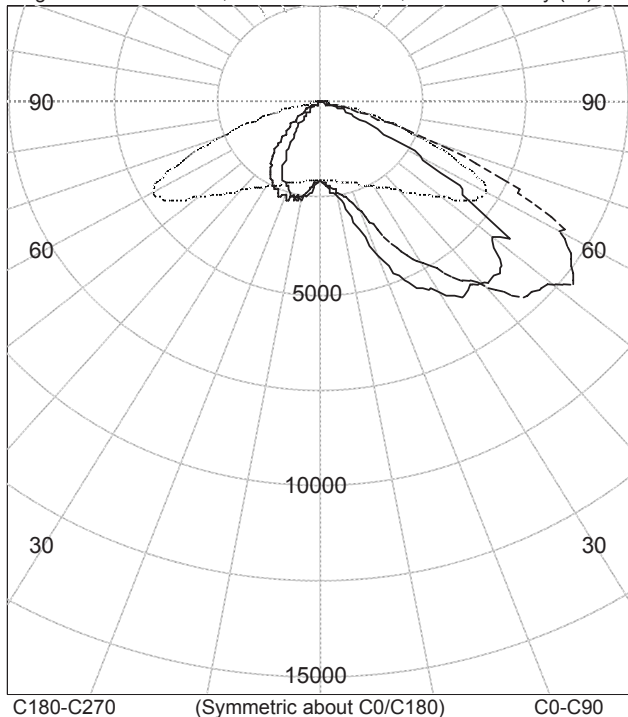




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Legend: C0/C180-Solid, C45/C225-Dashed, C90/C270-Grey (cd)



### INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	2050	2050	2050	2050	2050	214
5.0	2209	2189	2180	2119	2064	
10.0	2537	2500	2367	2211	2089	
15.0	3240	3047	2640	2352	2155	745
20.0	4417	4147	3179	2503	2238	1461
25.0	5198	4969	4049	2753	2359	
30.0	5706	5619	4765	3112	2525	
35.0	6146	6241	5586	3622	2735	2220
40.0	6178	6493	6318	4290	3003	2898
45.0	6137	6790	7137	4770	3378	
50.0	5446	6410	7402	5532	3872	
55.0	4195	6032	7403	6347	4442	3252
60.0	2777	3929	6720	7082	4650	2447
65.0	1228	1901	5330	6644	3835	
70.0	595	808	2694	5366	2397	
75.0	165	284	934	3514	1237	924
80.0	79	93	364	1526	507	135
85.0	30	35	95	467	114	
90.0	0	0	0	0	0	

### ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	2421	N / A	16.9
0-40	4640	N / A	32.5
0-60	10790	N / A	75.5
0-90	14297	N / A	100.0
40-90	9657	N / A	67.5
60-90	3507	N / A	24.5
90-180	0	N / A	0.0
0-180	14297	N / A	100.0

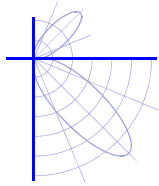
Total Light Output = 14,297 lm

Signed:

*Ryder Tunney*  
Ryder Tunney  
Authorized Signatory

Date of test 31-May-2017  
Date of report 1-Jun-2017

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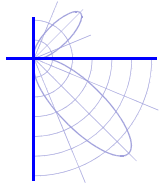


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Intensity data (cd)					
Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	2050	2050	2050	2050	2050
2.5	2118	2105	2103	2078	2052
5.0	2209	2189	2180	2119	2064
7.5	2370	2347	2262	2159	2070
10.0	2537	2500	2367	2211	2089
12.5	2787	2692	2480	2246	2118
15.0	3240	3047	2640	2352	2155
17.5	3834	3482	2862	2411	2192
20.0	4417	4147	3179	2503	2238
22.5	4862	4595	3518	2627	2288
25.0	5198	4969	4049	2753	2359
27.5	5508	5345	4439	2921	2431
30.0	5706	5619	4765	3112	2525
32.5	5940	5926	5108	3366	2618
35.0	6146	6241	5586	3622	2735
37.5	5981	6452	5826	3941	2856
40.0	6178	6493	6318	4290	3003
42.5	6160	6678	6748	4563	3184
45.0	6137	6790	7137	4770	3378
47.5	5818	6704	7219	5100	3605
50.0	5446	6410	7402	5532	3872
52.5	5647	5986	7732	5908	4159
55.0	4195	6032	7403	6347	4442
57.5	3709	4613	7106	6828	4610
60.0	2777	3929	6720	7082	4650
62.5	1835	3162	5997	7024	4397
65.0	1228	1901	5330	6644	3835
67.5	877	1205	3855	6113	3119
70.0	595	808	2694	5366	2397
72.5	321	529	1617	4504	1757
75.0	165	284	934	3514	1237
77.5	115	140	555	2432	825
80.0	79	93	364	1526	507
82.5	52	61	207	912	272
85.0	30	35	95	467	114
87.5	12	14	28	149	24
90.0	0	0	0	0	0

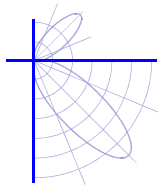




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Intensity data (cd)					
Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
0.0	2050	2050	2050	2050	2050
2.5	2052	2078	2073	2097	2100
5.0	2064	2081	2198	2306	2341
7.5	2070	2125	2337	2474	2499
10.0	2089	2243	2506	2486	2565
12.5	2118	2382	2490	2520	2629
15.0	2155	2468	2582	2502	2591
17.5	2192	2607	2687	2522	2412
20.0	2238	2650	2585	2384	2328
22.5	2288	2674	2586	2312	2249
25.0	2359	2797	2502	2201	2061
27.5	2431	2840	2407	2018	1909
30.0	2525	2955	2347	1872	1695
32.5	2618	2980	2233	1663	1486
35.0	2735	2968	2065	1451	1207
37.5	2856	3055	1931	1183	1007
40.0	3003	2932	1712	1000	807
42.5	3184	2886	1507	810	641
45.0	3378	2810	1263	635	487
47.5	3605	2730	1069	487	415
50.0	3872	2632	887	415	367
52.5	4159	2442	736	368	321
55.0	4442	2217	575	326	276
57.5	4610	1973	456	280	232
60.0	4650	1729	382	237	194
62.5	4397	1461	330	199	161
65.0	3835	1200	277	162	133
67.5	3119	951	227	132	110
70.0	2397	744	182	107	90
72.5	1757	566	142	86	72
75.0	1237	410	108	66	55
77.5	825	280	78	49	41
80.0	507	179	53	33	28
82.5	272	101	32	20	17
85.0	114	47	15	10	8
87.5	24	13	4	3	3
90.0	0	0	0	0	0



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### LM-79 Performance Data

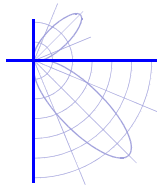
<b>Spectral</b>	CIE 1931 (x, y) <sup>(1)</sup>	(0.387, 0.388)
	CIE 1976 (u', v') <sup>(1)</sup>	(0.224, 0.508)
	Correlated Color Temperature (CCT) <sup>(1)</sup>	3930 K
	Spatial Δ (u', v') Uniformity <sup>(2)</sup>	0.0112
	Color Rendering Index (Ra) <sup>(1)</sup>	72.4
	Special CRI 9 (R <sub>9</sub> ) <sup>(1),(3)</sup>	-24.8
	Distance from Planckian Locus (Duv) <sup>(1),(3)</sup>	0.0037
	Scotopic/Photopic Ratio <sup>(1),(3)</sup>	1.48
<b>Electrical</b>	Voltage	120.0 V (Setpoint 1)
	Frequency	60.0 Hz
	Current	1.088 A
	Power	130 W
	Power Factor	0.996
	Current THD	5.2 %
	Voltage	277.0 V (Setpoint 2)
	Frequency	60.0 Hz
	Current	0.517 A
	Power	128 W
	Power Factor	0.894
	Current THD	12 %

Performance data in accordance with IESNA LM-79-08. Spectral calculations are for a CIE 2° observer  
Photometric and spectral values were measured at Setpoint 1

(1) Value is computed from the weighted average of the spatial measurements

(2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average

(3) Quantity is in addition to the scope of IESNA LM-79-08



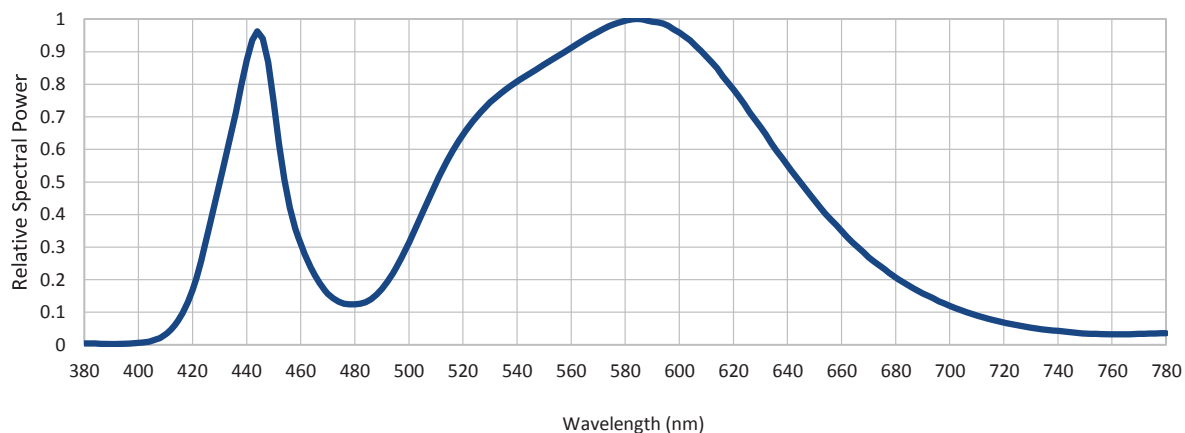
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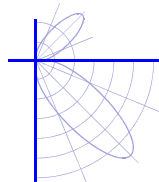
### LM-79 Performance Data

#### Summary relative spectral irradiance distribution (wavelength – nm, irradiance – relative to peak = 1)

380	0.004	480	0.124	580	0.995	680	0.207
385	0.004	485	0.135	585	1.000	685	0.181
390	0.003	490	0.172	590	0.992	690	0.158
395	0.004	495	0.233	595	0.982	695	0.138
400	0.006	500	0.315	600	0.959	700	0.120
405	0.013	505	0.405	605	0.927	705	0.104
410	0.032	510	0.494	610	0.885	710	0.090
415	0.080	515	0.577	615	0.837	715	0.079
420	0.169	520	0.645	620	0.784	720	0.068
425	0.321	525	0.700	625	0.726	725	0.060
430	0.499	530	0.744	630	0.669	730	0.053
435	0.677	535	0.779	635	0.608	735	0.047
440	0.874	540	0.808	640	0.552	740	0.043
445	0.951	545	0.834	645	0.496	745	0.039
450	0.748	550	0.861	650	0.445	750	0.035
455	0.464	555	0.886	655	0.394	755	0.033
460	0.309	560	0.912	660	0.350	760	0.032
465	0.218	565	0.938	665	0.308	765	0.032
470	0.157	570	0.961	670	0.269	770	0.034
475	0.129	575	0.982	675	0.238	775	0.035
						780	0.036



The relative spectral power distribution combines the weighted spectral power distributions of all spatial measurements.



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### LM-79 Performance Data

#### Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0° plane	Horiz. 90° plane
0.0	( 0.224, 0.510)	( 0.224, 0.510)
10.0	( 0.224, 0.506)	( 0.224, 0.510)
20.0	( 0.224, 0.503)	( 0.225, 0.511)
30.0	( 0.223, 0.502)	( 0.225, 0.511)
40.0	( 0.223, 0.498)	( 0.225, 0.513)
50.0	( 0.223, 0.499)	( 0.226, 0.515)
60.0	( 0.223, 0.502)	( 0.227, 0.517)
70.0	I <= 10% peak	( 0.226, 0.519)
80.0	I <= 10% peak	I <= 10% peak
-	-	-

#### Spatial measurements

Vert. angle (°)	CIE 1976 (u',v') coordinates	
	Horiz. 0° plane	Horiz. 90° plane
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

#### Test procedure

All measurements were performed in an environmentally controlled laboratory employing suitable baffling to minimize stray light. The sample was mounted in its normal operating orientation on a rotating mirror goniophotometer and operated from a stabilized supply. The photometric output was monitored and measurements were performed once stability was achieved.

The goniophotometer was used to measure the spatial distribution of both luminous intensity and, in conjunction with a spectroradiometer, spectral irradiance. The distribution locus comprises points in two or more planes (as indicated in the table above) at no more than 10° vertical intervals. The CIE (x,y) coordinates and other derived metrics (CIE (u', v'), CCT and CRI) are calculated from the weighted sum (weighted for intensity and represented solid angle) of the measured spectral irradiances.

Sample Orientation

Horizontal

Stabilization & total operation time 2.5 / 3.5 hours

#### Equipment and uncertainties

LightLab International R80A C-gamma rotating mirror goniophotometer with a test distance of 8 m.

Luminous Intensity	± 4 %	Temperature	± 1 °C
Luminous Flux	± 4 %	Luminous Efficacy	± 4.5 %
Horiz., Vert. Angles	± 0.25°		

PhotoResearch PR-670 spectroradiometer (grating with 380 - 780 nm range, 2 nm / pixel, 5 nm bandwidth, incandescent/halogen calibration source). Measured at a distance from the sample deemed >5 times the maximum observed luminous opening dimension.

CIE (x, y) coordinates	± 0.003	CCT	± 100 K
CIE (u', v') coordinates	± 0.002	CRI (Ra)	± 2
Spatial Δ (u', v') uniformity	± 0.001	Scotopic / Photopic Ratio *	± 0.02
Rel. Spectral Irradiance *	± 2 %	R9 *	± 2
Duv *	± 5E-04		

Yokogawa WT210 power meter connected in circuit to the sample electrical supply

Voltage	± 0.5 %	Frequency *	± 0.1 Hz
Current	± 0.5 %	Power	± 0.5 %
Current THD *	± 3 %	Power Factor	± 0.02

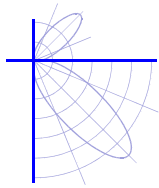
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Calculator / report version 1.0.7 / 5.7 (30th Jan 2017)

Page 8 of 10

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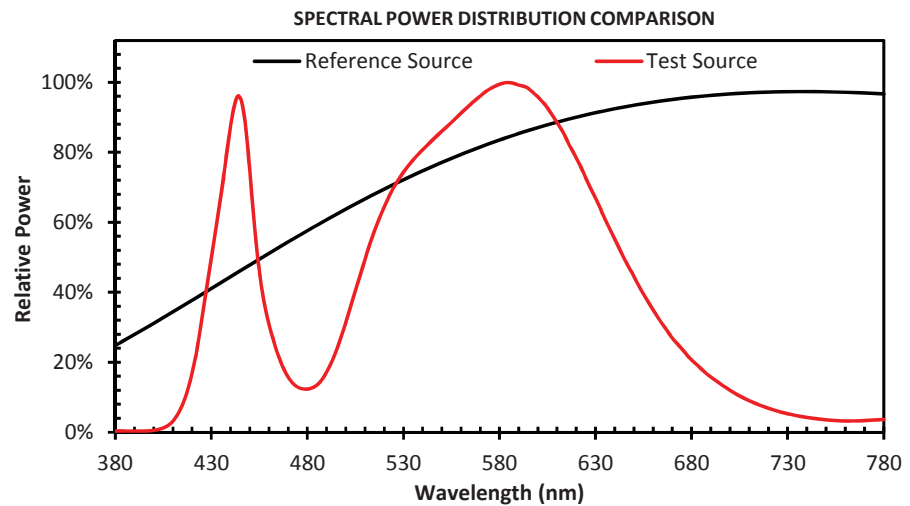




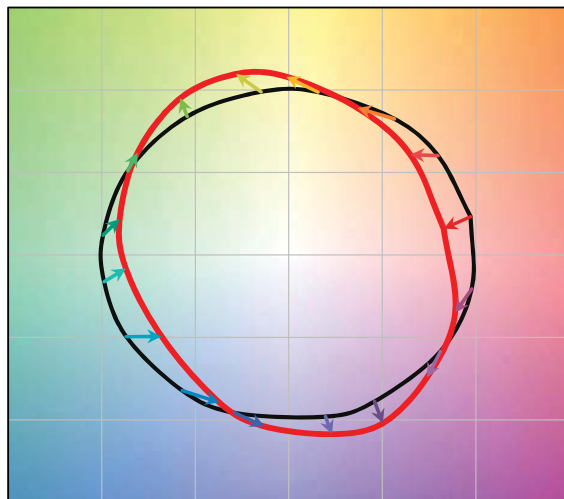
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$R_f$	71
$R_g$	96



COLOR VECTOR GRAPHIC

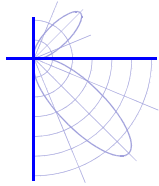


— Reference Illuminant — Test Source

COLOR DISTORTION GRAPHIC



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**Test Distance** 8.0 m  
**Test Temperature** 24.9 °C

**Notes** The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2011, ANSI C82.77:2002.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE Gamma coordinate system as defined in CIE publication number 121.

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