



PHOTOMETRIC EVALUATION OF AN LED STRIP LUMINAIRE

Model: Spyder – Hybrid

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Bryan Cubitt, Technical Team Leader



Program Description

Photometric Evaluation of a strip LED luminaire.

Executive Summary

The following table provides a brief overview of the key results for the “hybrid” Spyder LED sample:

Sample	Luminous Efficacy (Lumens / Watt)	Luminous Flux (Lumens)	Input Power (Watts)	Stabilization Time
Spyder Hybrid	33.86	1064.6	31.44	36 minutes



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Test Results – Spyder Hybrid	
The following results were measured after stabilization. Stability is reached when the variation of 3 readings of light output and electrical power, taken 15 minutes apart, is less than 0.50% (in accordance with IES LM-79-08).	
Key Photometric Results	Sample Reference# Spyder Hybrid
Luminous Efficacy (Lumens/Watt)	33.86
Total Luminous Flux (Lumens)	1064.6
Stabilization Time	36 minutes
Total Run Time – Goniophotometer	75 minutes
Electrical Input Results:	Sample Reference# Spyder Hybrid
Input Power (Watts)	31.44
Input Voltage (Volts AC)	120.0
Input Current (Amps)	0.572
Input Frequency (Hertz)	60.0
Power Factor	0.458
Additional Information	Sample Reference# Spyder Hybrid
Ambient Temperature	25.7° C

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Test Results – Zonal Lumen Summary

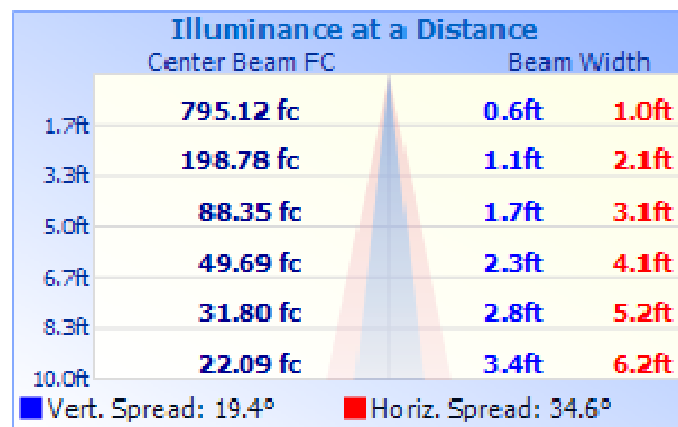
The following table depicts the zonal lumen summary for the hybrid Spyder strip luminaire:

Zone	Lumens	% Total
0 - 10	179.7	16.9
10 - 20	322.3	30.3
20 - 30	258.2	24.3
30 - 40	141.6	13.3
40 - 50	73.8	6.9
50 - 60	43.7	4.1
60 - 70	27.4	2.6
70 - 80	14.4	1.3
80 - 90	3.5	0.3
Total	1064.6 Lumens	100%

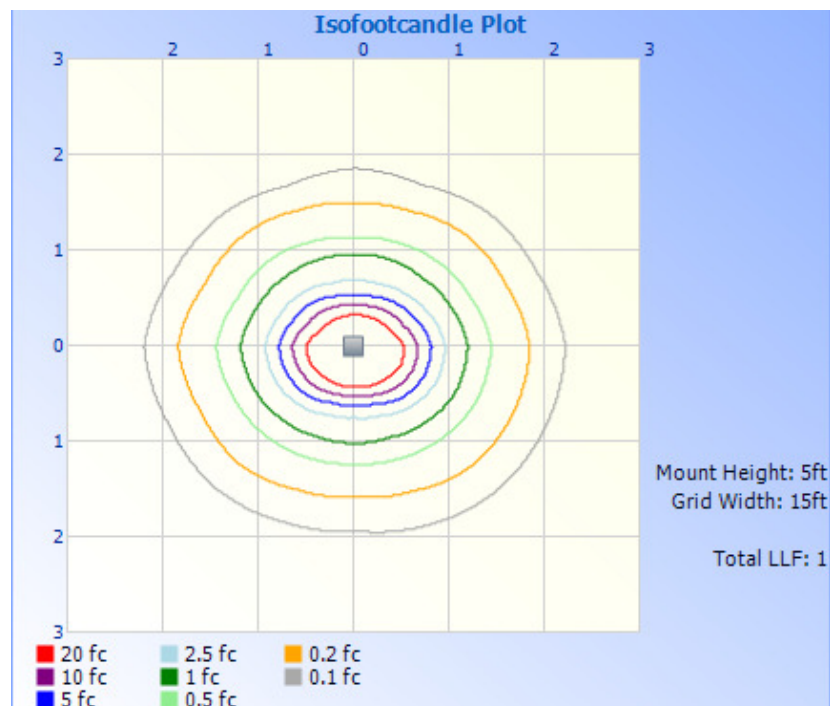
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Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.



Illuminance Beam Spread (Footcandles)

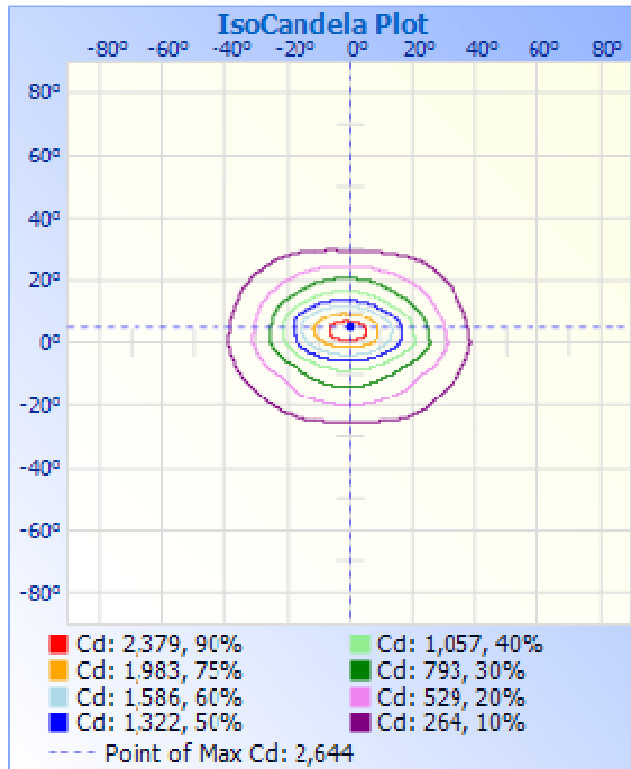


Illuminance Distribution Plot (Footcandles)

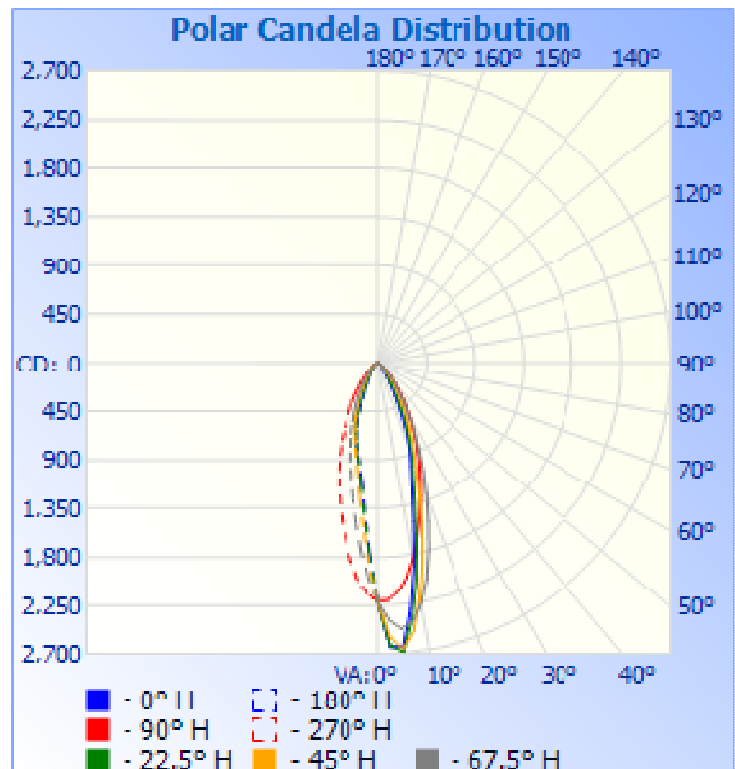
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Test Results – Candela Plots

The following images depict the luminous intensity distribution characteristics of the hybrid Spyder strip LED luminaire.



Isocandela Plot



Polar Candela Distribution

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Test Results – Candela Tabulation

The following table provides the tabulated Candela measurements:

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5	225.0	247.5	270.0	292.5	315.0	337.5	360.0
0.0	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66	2208.66
2.5	2637.60	2625.00	2541.70	2386.00	2201.40	2027.40	1882.20	1784.30	1748.80	1771.50	1855.10	1986.10	2146.90	2329.70	2489.20	2592.20	2636.30
5.0	2643.60	2688.30	2659.40	2472.80	2130.80	1804.00	1557.10	1417.40	1366.20	1401.10	1526.10	1741.50	2027.70	2346.10	2525.40	2601.80	2644.00
7.5	2292.90	2390.40	2511.00	2421.50	2004.00	1565.30	1285.30	1151.40	1106.10	1135.10	1252.90	1502.10	1871.90	2232.20	2306.40	2266.50	2292.70
10.0	1909.80	2038.40	2208.70	2271.90	1839.30	1341.70	1081.80	982.81	948.62	963.10	1048.10	1287.20	1699.30	2031.10	1960.40	1898.20	1909.90
12.5	1502.20	1649.10	1886.50	2052.80	1657.90	1144.30	935.92	865.36	836.38	841.85	899.68	1102.80	1526.70	1783.20	1629.30	1513.40	1501.60
15.0	1194.80	1299.60	1558.50	1792.80	1472.90	981.20	822.59	767.53	738.63	742.14	785.69	952.24	1362.10	1529.70	1325.20	1199.80	1194.80
17.5	1006.30	1061.10	1250.80	1529.60	1297.70	845.46	721.13	664.87	631.81	644.24	688.00	820.20	1209.30	1291.40	1075.30	995.69	1006.40
20.0	852.66	899.78	1009.90	1293.80	1132.70	728.67	622.76	546.71	500.01	532.13	595.60	704.25	1068.00	1084.40	887.67	848.97	852.67
22.5	678.17	750.64	829.14	1082.90	981.20	621.04	525.28	420.16	373.15	416.35	506.90	598.83	932.05	904.71	745.58	699.12	678.29
25.0	495.99	592.00	689.60	897.52	839.34	521.42	427.95	311.38	270.12	314.44	419.99	501.49	798.39	747.68	622.81	541.29	495.53
27.5	336.72	438.10	568.44	731.37	705.07	432.82	338.58	229.94	201.93	232.88	340.91	416.16	673.44	607.18	510.50	396.31	336.72
30.0	232.44	308.06	458.04	586.58	584.76	354.82	262.22	176.61	154.78	178.92	270.00	341.18	557.20	485.60	407.32	282.41	232.33
32.5	174.73	218.24	360.81	465.26	478.18	288.71	202.73	138.98	128.59	140.78	213.56	277.76	451.65	385.89	316.81	205.56	174.76
35.0	138.44	163.95	276.93	365.72	385.60	233.53	157.63	115.28	111.76	116.55	168.55	225.09	359.88	304.97	243.45	157.06	138.70
37.5	113.15	129.52	210.52	285.48	305.48	188.01	125.20	99.57	95.63	101.23	134.49	181.72	282.21	240.06	184.60	125.17	113.21
40.0	96.18	105.27	160.35	222.01	238.25	151.20	101.94	84.78	87.91	85.40	109.12	146.59	218.26	188.66	141.49	103.47	96.24
42.5	82.96	88.33	124.95	172.43	183.40	122.26	85.40	77.19	78.26	75.91	90.64	119.02	169.71	149.17	111.77	87.82	83.01
45.0	72.81	75.51	99.64	134.38	141.98	98.62	72.62	67.61	59.30	67.12	76.61	98.06	135.74	119.09	91.17	74.83	72.85
47.5	64.02	65.61	81.76	106.24	113.08	81.06	63.01	54.11	47.45	54.82	66.36	82.34	112.00	96.85	76.57	64.97	64.09
50.0	52.65	57.63	68.95	86.32	93.13	68.14	54.28	44.58	39.37	46.04	57.88	69.45	94.57	80.23	66.15	56.96	52.68
52.5	43.47	49.94	59.51	72.45	78.92	58.30	48.20	38.30	34.16	40.09	50.52	58.94	81.03	67.78	57.41	48.73	43.45
55.0	37.51	42.41	51.89	62.00	68.09	50.93	43.57	33.62	30.49	35.24	44.22	50.52	69.93	57.32	49.98	41.17	37.52
57.5	32.71	37.00	46.57	53.60	58.43	44.76	38.52	29.43	27.50	29.91	39.01	43.48	60.06	48.53	44.61	35.57	32.71
60.0	28.93	32.87	41.71	46.74	49.98	38.64	33.87	24.69	24.84	24.39	32.34	37.21	51.55	41.67	39.20	31.24	28.92
62.5	25.85	29.94	36.82	40.62	43.15	33.26	28.31	21.19	23.31	20.44	27.23	32.02	43.86	36.14	34.34	28.17	25.87
65.0	23.39	27.28	31.93	34.85	37.21	28.78	24.96	17.83	21.82	17.41	23.12	27.95	36.93	31.28	29.35	25.64	23.40
67.5	21.70	24.01	27.89	30.40	31.96	24.93	20.41	16.56	17.81	14.74	18.42	23.88	30.84	27.13	25.03	22.71	21.71
70.0	21.86	21.96	23.74	25.92	27.35	21.69	17.31	11.08	13.78	10.58	15.80	20.74	25.84	22.83	21.30	20.37	21.87
72.5	18.09	21.88	21.30	22.57	23.14	18.48	15.26	7.30	8.26	7.07	12.23	18.44	21.64	19.64	19.41	20.11	18.17
75.0	12.57	14.91	19.80	19.03	19.66	16.38	9.86	4.35	4.36	4.04	7.90	17.06	18.08	16.62	18.05	13.03	12.60
77.5	7.97	10.22	16.62	17.38	16.24	14.84	6.02	1.95	2.50	1.97	4.03	12.88	14.39	15.84	12.45	8.82	8.01
80.0	4.57	6.30	9.52	17.23	12.96	10.71	2.82	1.58	0.74	1.44	2.05	7.28	10.51	11.81	7.28	5.14	4.58
82.5	2.38	3.34	5.51	11.52	9.64	5.74	1.81	1.42	0.07	1.19	1.55	3.53	6.76	6.99	3.39	2.55	2.40
85.0	1.88	1.97	2.41	5.82	6.21	3.02	1.36	1.38	0.06	1.14	1.17	2.28	4.15	3.13	2.05	1.81	1.88
87.5	1.70	1.90	1.92	2.84	3.77	2.04	1.10	1.31	0.06	1.06	1.01	1.63	3.61	2.10	1.76	1.61	1.70
90.0	1.66	1.83	1.69	2.11	3.61	1.45	0.97	1.00	1.08	0.98	0.91	1.32	6.61	1.61	1.56	1.52	1.80

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Photometric Testing Information

This sample was evaluated for photometric and electrical characteristics using a goniophotometer located in purpose-built, temperature and humidity-controlled, draft free environment. The goniophotometer was manufactured by Mayer Engineering and is calibrated using a frosted tungsten filament FDS/DZE lamp with the following specifications:

Manufacturer: General Electric
Part Number: CSB-110
Bulb Number: 108-A
Voltage: 24.0 Volts
Wattage: 150.0 Watts
Calibration Current: 4.799 Amperes
Luminous Intensity: 150.3 Candelas
Calibration Date: 4-14-2009 (NIST traceable)