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## Photometric Test Report

Relevant Standards  
IES LM-79-2008  
ANSI C82.77-2002  
UL1598-2008

**Prepared For**  
**LDPI Inc**  
Brandon Gerstl  
206 Cashman Dr  
Chippewa Falls, WI 54729

**Catalog Number**  
**LE121-P22-4-4R-V1-C2-P-5-PW**  
Order Number  
10772159  
Test Number  
1050086

Test Date

2015-04-30

Prepared By

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Approved By

Jeffrey Lockner, Project Engineer

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## DLC Results Summary

Technical Requirements v2.1

High-Bay Luminaires for Commercial and Industrial Buildings		
Requirement Category	Requirement	Test Results
Minimum Light Output	≥9000 Lumens	37600 Lumens
Minimum Lamp Output	N/A	N/A
Spacing Criteria (0-180°)	N/A	N/A
Spacing Criteria (90-270°)	N/A	N/A
Zonal Lumen Requirement (20-50°)	≥20%	56.9%
Zonal Lumen Requirement 2	N/A	N/A
Minimum Luminaire Efficacy	≥77.6 lm/w	104 lm/w
Minimum Lamp Efficacy	N/A	N/A
Allowable CCTs*	≤5700 K	5397 K
Minimum CRI	≥68	84.4
L70 Lumen maintenance	35000 Hours	TM-21 must be completed
Minimum Luminaire Warranty	5 Years	N/A
Power Factor 120 / 277	≥0.87	0.983 at 277 V
Total Harmonic Distortion (A-%)	≤25%	10.1% at 277 V

\*Defined by ANSI C78.377-2011†

†ANSI C78.377-2011 also referred to for Duv and (x,y) chromaticity coordinates tolerances for indoor categories

Laboratory results may not be representative of field performance  
Ballast factors have not been applied

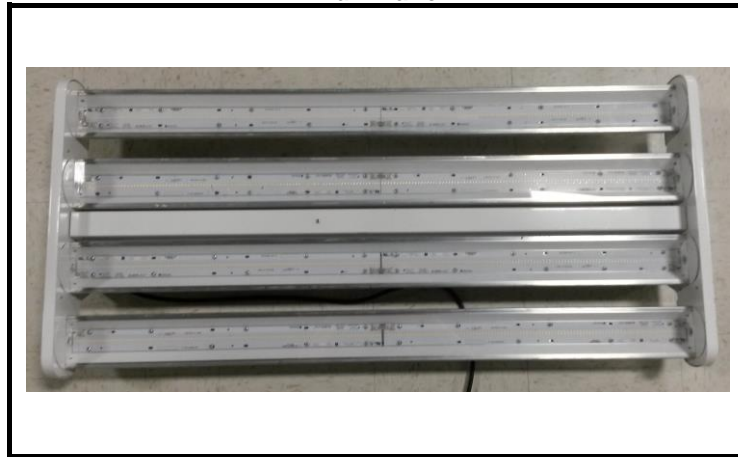
Testing was performed in a 3-meter integrating sphere using the 4π geometry method.

Absorption correction was employed for Sphere measurement



**Luminaire Description:** White steel housing, aluminum heatsink, clear plastic lenses  
**Lamp:** 768 white LEDs  
**Mounting:** High Bay  
**Ballast/Driver:** Four Everline D21CC80UNVTW-D

**Luminaire**



**Luminaire Characteristics**

Luminous Length: 44.00 in.  
Luminous Width: 20.75 in.  
Luminous Height: 2.00 in.

**Summary of Results**

**Integrating Sphere**

Luminous Flux: 38470 Lumens  
Efficacy: 107.2 lm/w  
CCT: 5397 K  
CRI (Ra): 84.4

**Distribution**

Total Luminaire Output: 37600 Lumens  
Luminaire Efficacy: 104.4 lm/w  
Maximum Candela: 15415 Candela

**Electrical Data at 277 VAC**

Test Temperature: 25.8 °C  
Voltage: 277.0 VAC  
Current: 1.287 A  
Power: 350.8 W  
Power Factor: 0.983  
Frequency: 60 Hz  
Current THD: 10.1 %

**In-Situ**

LED Temperature: 70.0 °C  
Driver Temperature: 53.1 °C  
Maximum LED Current: 0.1320 A

Temperature is offset to an ambient temperature of 25°C as described in UL1598-2008.



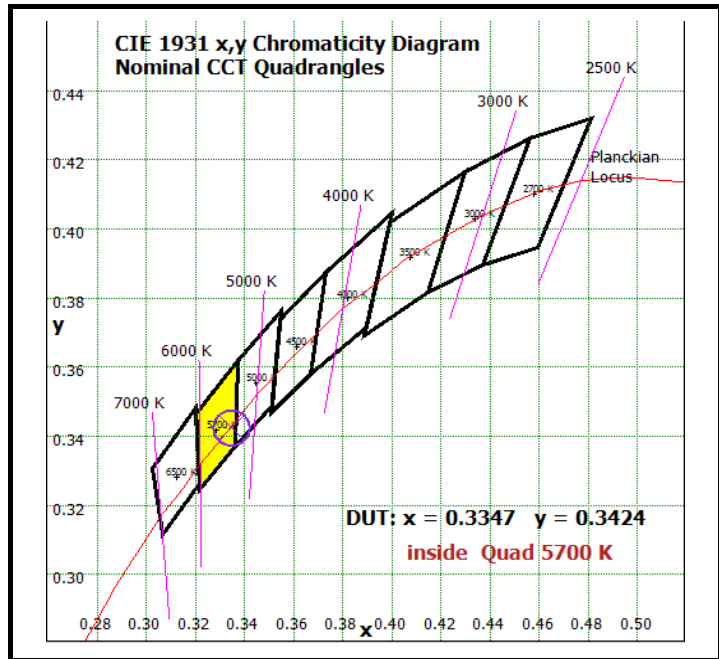
## Color Quality - Integrating Sphere

### Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.5 °C	120.0 VAC	2.997 A	359.0 W	0.998	60 Hz	4.39 %

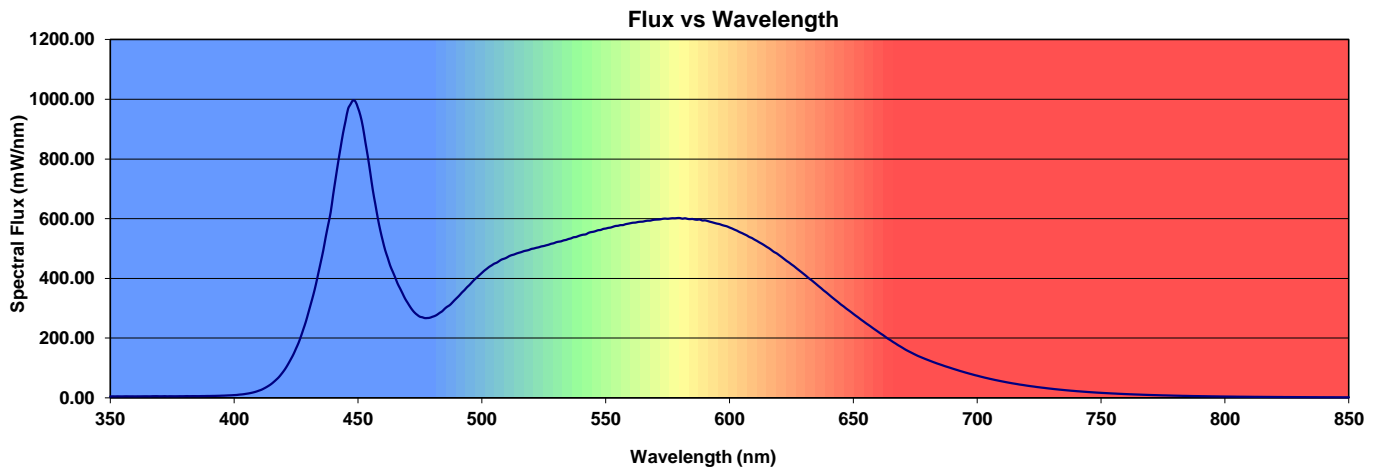
### Summary of Results

<b>Total Output:</b>	38470 Lumens
<b>Efficacy:</b>	107.2 lm/w
<b>CCT:</b>	5397 K
<b>CRI (Ra):</b>	84.4
<b>CRI (R9):</b>	16.0
Chromaticity (x):	0.3347
Chromaticity (y):	0.3424
Chromaticity (u):	0.2079
Chromaticity (v):	0.3190
Chromaticity (u')	0.2079
Chromaticity (v')	0.4785
Duv:	-0.0006



### Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
84.4	83.4	88.3	91.5	85.5	84.8	83.9	87.1	71.1	16.0	72.3	85.7	69.8	84.4	95.4





## Distribution - Goniophotometer

### Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.4 °C	120.0 VAC	3.005 A	360.1 W	0.998	60 Hz	4.37 %

### Summary of Results

#### Spacing Criteria

0-180: 1.27  
90-270: 1.27

#### Total Lumen Output:

37600 Lumens

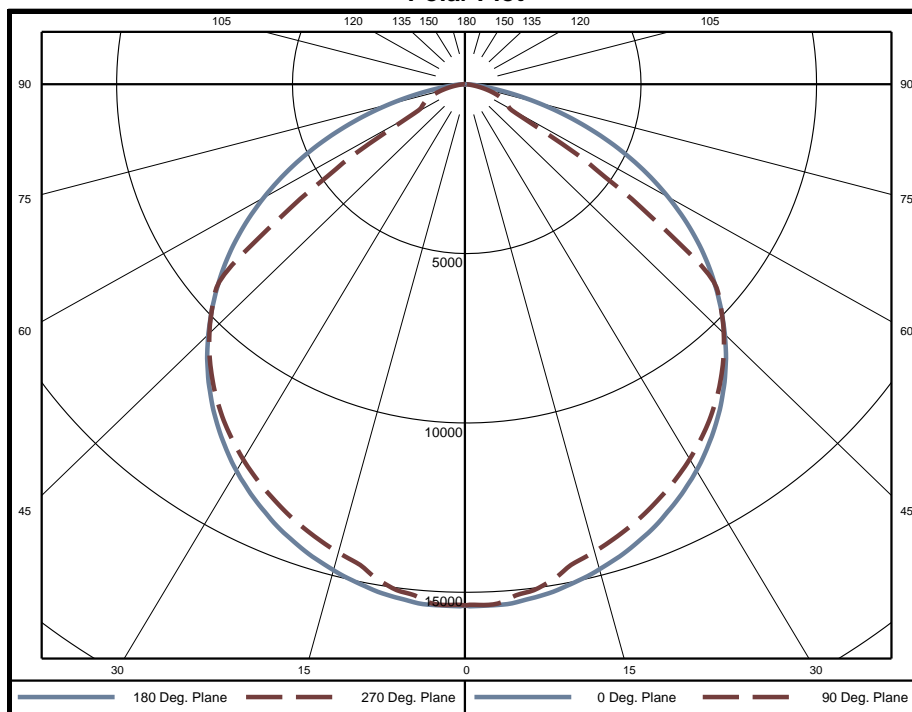
#### Luminaire Efficacy:

104.4 lm/w

#### Maximum Candela:

15415 Candela

### Polar Plot



### Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	368	1.0%	60-65	1803	4.8%	120-125	0	0.0%
5-10	1085	2.9%	65-70	1179	3.1%	125-130	0	0.0%
10-15	1748	4.6%	70-75	784	2.1%	130-135	0	0.0%
15-20	2345	6.2%	75-80	387	1.0%	135-140	0	0.0%
20-25	2873	7.6%	80-85	174	0.5%	140-145	0	0.0%
25-30	3301	8.8%	85-90	67	0.2%	145-150	0	0.0%
30-35	3624	9.6%	90-95	23	0.1%	150-155	0	0.0%
35-40	3834	10.2%	95-100	11	0.0%	155-160	0	0.0%
40-45	3910	10.4%	100-105	0	0.0%	160-165	0	0.0%
45-50	3843	10.2%	105-110	0	0.0%	165-170	0	0.0%
50-55	3533	9.4%	110-115	0	0.0%	170-175	0	0.0%
55-60	2709	7.2%	115-120	0	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	19178	51.0%
0-60	29872	88.2%
0-90	37567	99.9%
90-180	34	0.1%



**Candela Tabulation**  
Horizontal Angle (Degrees)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390	15390
5	15390	15410	15370	15260	15210	15260	15370	15410	15390	15410	15370	15260	15210	15260	15370	15410
10	15160	15170	14980	14890	14810	14890	14980	15170	15160	15170	14980	14890	14810	14890	14980	15170
15	14820	14680	14430	14310	14280	14310	14430	14680	14820	14680	14430	14310	14280	14310	14430	14680
20	14380	14190	13820	13840	13860	13840	13820	14190	14380	14190	13820	13840	13860	13840	13820	14190
25	13820	13470	13230	13310	13360	13310	13230	13470	13820	13470	13230	13310	13360	13310	13230	13470
30	13170	12560	12530	12690	12790	12690	12530	12560	13170	12560	12530	12690	12790	12690	12530	12560
35	12380	11710	11750	11980	12120	11980	11750	11710	12380	11710	11750	11980	12120	11980	11750	11710
40	11480	10740	10870	11180	11330	11180	10870	10740	11480	10740	10870	11180	11330	11180	10870	10740
45	10450	9674	9896	10240	10410	10240	9896	9674	10450	9674	9896	10240	10410	10240	9896	9674
50	9302	8498	8799	9180	9345	9180	8799	8498	9302	8498	8799	9180	9345	9180	8799	8498
55	8059	7258	7595	6658	5326	6658	7595	7258	8059	7258	7595	6658	5326	6658	7595	7258
60	6680	5915	6201	2594	1542	2594	6201	5915	6680	5915	6201	2594	1542	2594	6201	5915
65	5211	4542	2798	1266	1288	1266	2798	4542	5211	4542	2798	1266	1288	1266	2798	4542
70	3677	3176	950	1034	1033	1034	950	3176	3677	3176	950	1034	1033	1034	950	3176
75	2202	1439	712	712	685	712	712	1439	2202	1439	712	712	685	712	712	1439
80	967	427	422	384	342	384	422	427	967	427	422	384	342	384	422	427
85	308	239	196	151	103	151	196	239	308	239	196	151	103	151	196	239
90	10	98	94	58	16	58	94	98	10	98	94	58	16	58	94	98
95	10	29	38	29	8	29	38	29	10	29	38	29	8	29	38	29
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Average Luminance (cd/m<sup>2</sup>)**  
Horizontal Angle (Degrees)

	0	45	90
0	26130	26130	26130
45	24000	21590	22800
55	22400	19660	13860
65	19070	9251	4288
75	12350	3397	3306
85	3953	1775	950



### Utilization of Lumens - Zonal Cavity Method

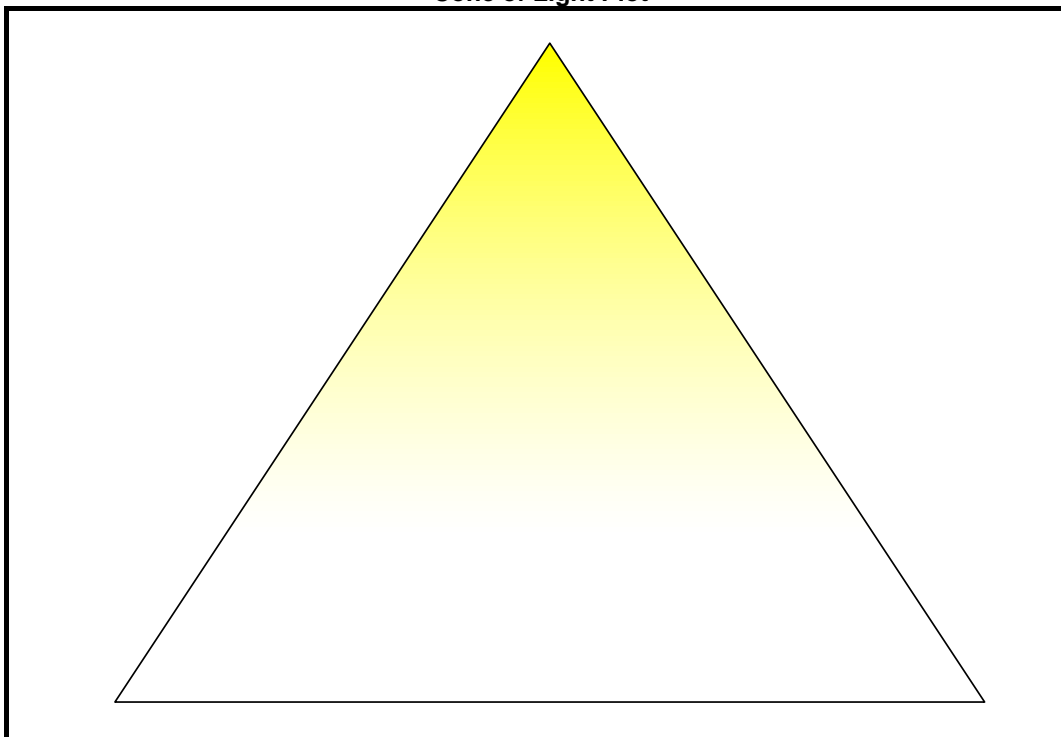
Effective Floor Cavity Reflectance 20%

Ceiling Cavity Reflectance	80				70				50			30			10			0
Wall Reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **																	
0	44753	44753	44753	44753	43708	43708	43708	43708	41758	41758	41758	39974	39974	39974	38335	38335	38335	37565
1	41458	39903	38510	37255	40461	39059	37795	36649	37477	36442	35493	36024	35185	34409	34684	34015	33390	32637
2	38083	35316	33028	31103	37130	34619	32518	30735	33308	31546	30024	32100	30634	29347	30982	29776	28700	27934
3	34958	31345	28549	26321	34062	30763	28173	26087	29666	27453	25630	28651	26770	25190	27710	26123	24765	23992
4	32149	27971	24911	22574	31318	27482	24626	22418	26558	24078	22114	25701	23556	21818	24903	23057	21531	20761
5	29649	25110	21938	19597	28885	24697	21718	19490	23915	21292	19281	23187	20884	19076	22508	20493	18876	18117
6	27427	22677	19489	17201	26729	22326	19315	17125	21660	18977	16976	21038	18652	16830	20457	18340	16686	15945
7	25456	20600	17452	15247	24821	20300	17312	15191	19730	17040	15082	19196	16778	14974	18694	16524	14868	14150
8	23709	18820	15745	13633	23133	18562	15631	13591	18071	15409	13509	17610	15194	13428	17176	14986	13348	12656
9	22156	17284	14301	12286	21634	17062	14207	12254	16637	14023	12191	16236	13844	12128	15859	13672	12066	11401
10	20773	15954	13070	11150	20299	15760	12991	11125	15391	12837	11076	15042	12688	11027	14711	12543	10978	10339

### Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	962	4.92
6.00	428	7.38
8.00	240	9.84
10.0	154	12.3
12.0	107	14.8
14.0	78.5	17.2
16.0	60.1	19.7

### Cone of Light Plot





## In-Situ Test

### In-Situ Test Conditions

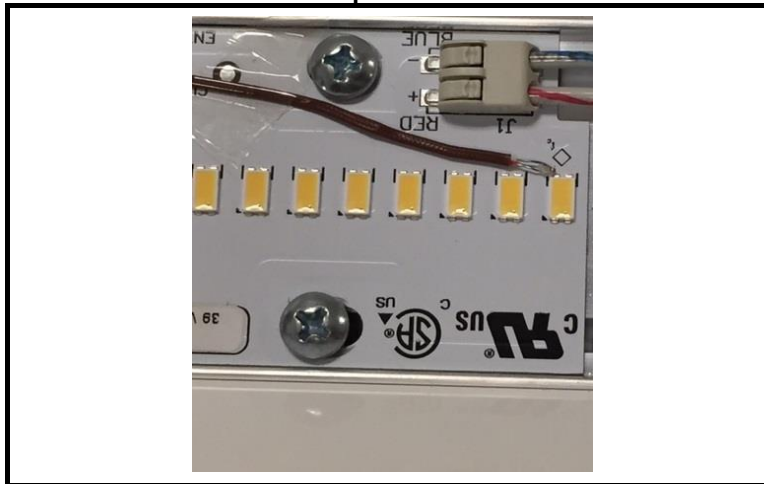
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.0 °C	118.7 VAC	N/A	N/A	N/A	60 Hz	N/A

### Summary of Results

LED Temperature: 70.0 °C  
Driver Temperature: 53.1 °C  
Maximum LED Current: 0.1320 A

Temperatures are offset to an ambient temperature of 25°C as described in UL1598-2008

### LED Temperature Location



### Driver Temperature Location

