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Photometric Test Report

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

Prepared For
LDPI Inc
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Chippewa Falls, WI 54729

Catalog Number
LE121-P16-4-4R-V1-C2-P-5-PW
Order Number
10895777
Test Number
1133842

Test Date

2015-08-06 - 2015-08-11

Prepared By

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Approved By

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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	28780 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	112 lm/w
Minimum Lamp Efficacy	N/A	N/A
Allowable CCTs*	≤5700 K	5339 K
Minimum CRI	≥68	84.2
L70 Lumen maintenance	35000 Hours	TM-21 must be completed
Minimum Luminaire Warranty	5 Years	N/A
Power Factor 120 / 277	≥0.87	0.979 at 277 V
Total Harmonic Distortion (A-%)	≤25%	10.3% 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

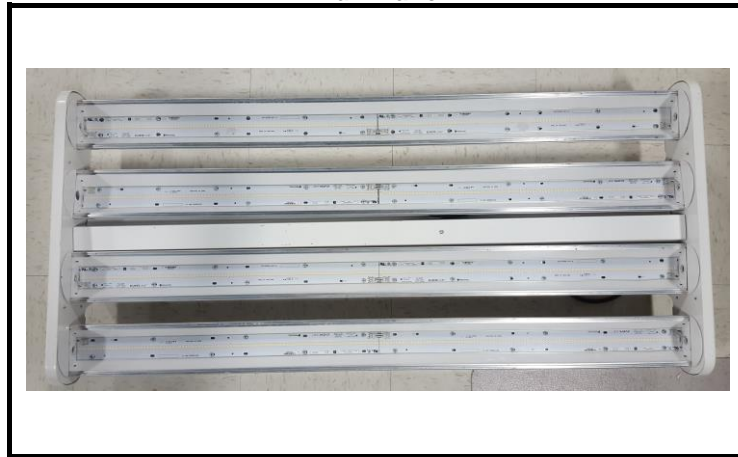
Testing was performed in a 3-meter integrating sphere using the 4π geometry method.

Absorption correction was employed for Sphere measurement



Luminaire Description: White steel housing, aluminum heatsink, clear plastic lenses
Lamp: 768 white LEDs, eight LED boards with 96 LEDs each
Mounting: High Bay
Ballast/Driver: Four Everline D21CC80UNVTW-D

Luminaire



Luminaire Characteristics

Luminous Length: 46.50 in.
Luminous Width: 21.00 in.

Summary of Results

Integrating Sphere

Luminous Flux: 29800 Lumens
Efficacy: 116.0 lm/w
CCT: 5339 K
CRI (Ra): 84.2

Distribution

Total Luminaire Output: 28780 Lumens
Luminaire Efficacy: 112 lm/w
Maximum Candela: 11879 Candela

Electrical Data at 277 VAC

Test Temperature: 24.6 °C
Voltage: 277.0 VAC
Current: 0.9389 A
Power: 254.5 W
Power Factor: 0.979
Frequency: 60 Hz
Current THD: 10.3 %

In-Situ

LED Temperature: 54.2 °C
Driver Temperature: 47.2 °C
Maximum LED Current: 0.1117 A

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



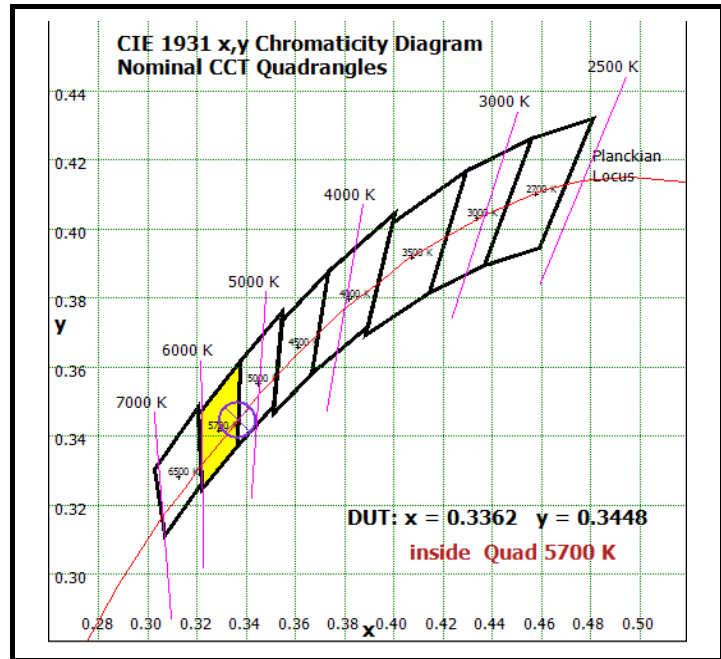
Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.3 °C	120.0 VAC	2.145 A	256.8 W	0.998	60 Hz	5.14 %

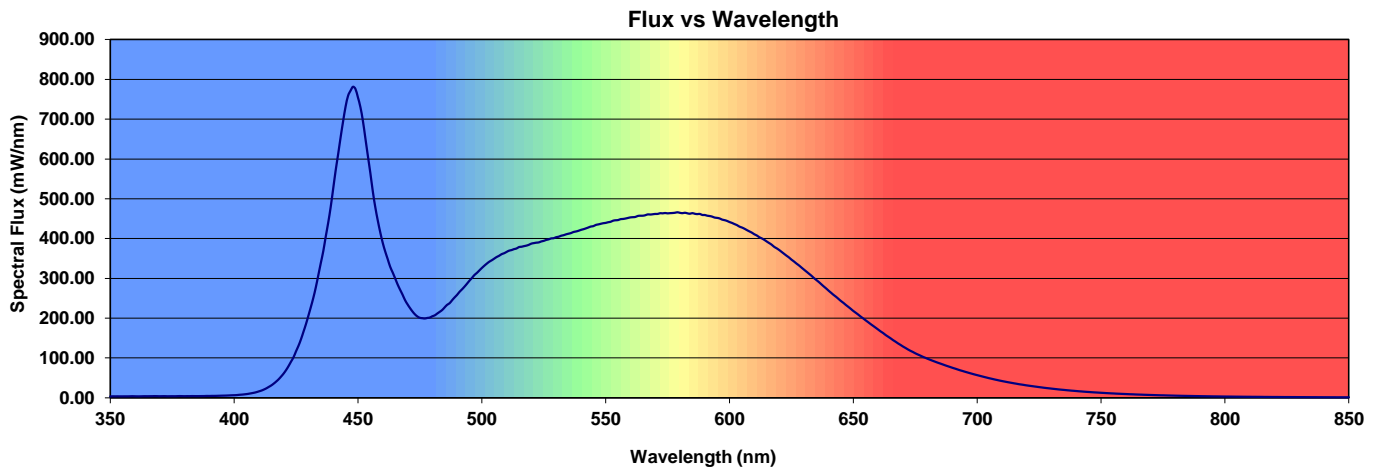
Summary of Results

Total Output:	29800 Lumens
Efficacy:	116.0 lm/w
CCT:	5339 K
CRI (Ra):	84.2
CRI (R9):	14.8
Chromaticity (x):	0.3362
Chromaticity (y):	0.3448
Chromaticity (u):	0.2080
Chromaticity (v):	0.3200
Chromaticity (u'):	0.2080
Chromaticity (v'):	0.4800
Duv:	0.0000



Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
84.2	83.0	88.1	91.5	85.2	84.4	83.7	87.0	70.7	14.8	71.8	85.5	69.2	84.0	95.5





Distribution - Goniophotometer

Distribution Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.6 °C	120.0 VAC	2.145 A	256.9 W	0.998	60 Hz	5.14 %

Summary of Results

Spacing Criteria

0-180: 1.26
90-270: 1.26

Total Lumen Output:

28780 Lumens

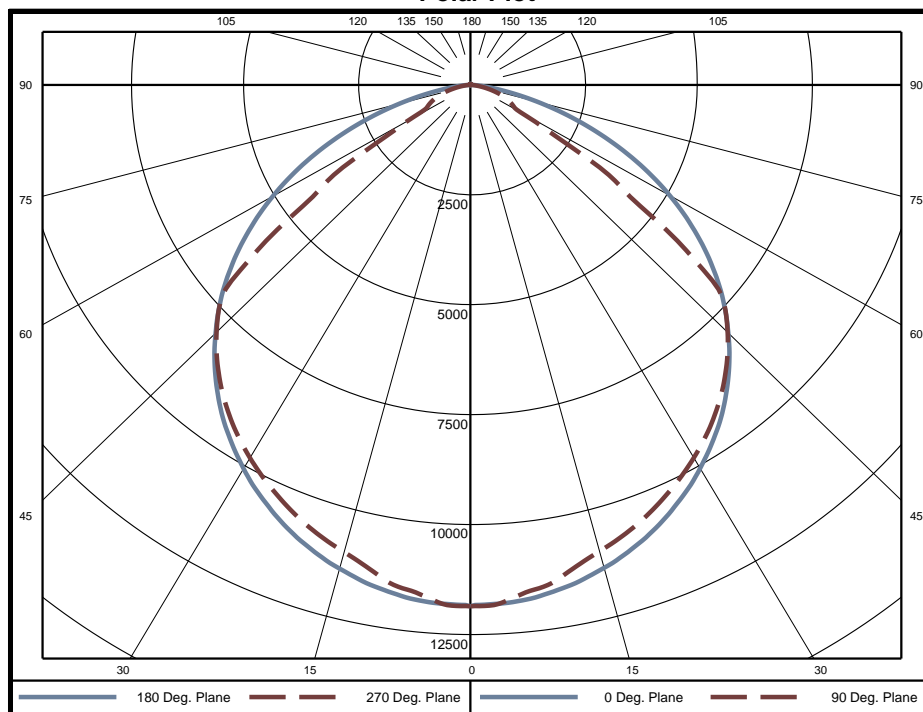
Luminaire Efficacy:

112.0 lm/w

Maximum Candela:

11879 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	283	1.0%	60-65	1368	4.8%	120-125	5	0.0%
5-10	832	2.9%	65-70	900	3.1%	125-130	5	0.0%
10-15	1341	4.7%	70-75	583	2.0%	130-135	5	0.0%
15-20	1801	6.3%	75-80	291	1.0%	135-140	5	0.0%
20-25	2204	7.7%	80-85	134	0.5%	140-145	5	0.0%
25-30	2533	8.8%	85-90	53	0.2%	145-150	5	0.0%
30-35	2779	9.7%	90-95	17	0.1%	150-155	4	0.0%
35-40	2937	10.2%	95-100	8	0.0%	155-160	4	0.0%
40-45	2995	10.4%	100-105	6	0.0%	160-165	3	0.0%
45-50	2941	10.2%	105-110	5	0.0%	165-170	2	0.0%
50-55	2652	9.2%	110-115	5	0.0%	170-175	1	0.0%
55-60	2060	7.2%	115-120	5	0.0%	175-180	0	0.0%

Zone	Lumens	% of Luminaire
0-40	14710	51.1%
0-60	25358	88.1%
0-90	28687	99.7%
90-180	90	0.3%



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	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860	11860
5	11790	11850	11780	11690	11670	11690	11780	11850	11790	11850	11780	11690	11670	11690	11780	11850
10	11620	11610	11470	11420	11380	11420	11470	11610	11620	11610	11470	11420	11380	11420	11470	11610
15	11370	11240	11090	10990	10980	10990	11090	11240	11370	11240	11090	10990	10980	10990	11090	11240
20	11030	10860	10620	10640	10650	10640	10620	10860	11030	10860	10620	10640	10650	10640	10620	10860
25	10590	10330	10160	10210	10240	10210	10160	10330	10590	10330	10160	10210	10240	10210	10160	10330
30	10070	9679	9619	9728	9794	9728	9619	9679	10070	9679	9619	9728	9794	9728	9619	9679
35	9480	8980	9009	9175	9280	9175	9009	8980	9480	8980	9009	9175	9280	9175	9009	8980
40	8788	8235	8330	8561	8678	8561	8330	8235	8788	8235	8330	8561	8678	8561	8330	8235
45	8000	7408	7578	7840	7976	7840	7578	7408	8000	7408	7578	7840	7976	7840	7578	7408
50	7130	6497	6732	7022	6928	7022	6732	6497	7130	6497	6732	7022	6928	7022	6732	6497
55	6141	5531	5791	4709	4006	4709	5791	5531	6141	5531	5791	4709	4006	4709	5791	5531
60	5065	4506	4438	2089	1445	2089	4438	4506	5065	4506	4438	2089	1445	2089	4438	4506
65	3907	3446	2139	983	988	983	2139	3446	3907	3446	2139	983	988	983	2139	3446
70	2711	2401	740	784	779	784	740	2401	2711	2401	740	784	779	784	740	2401
75	1598	1032	543	542	517	542	543	1032	1598	1032	543	542	517	542	543	1032
80	703	328	322	298	266	298	322	328	703	328	322	298	266	298	322	328
85	229	180	154	127	92	127	154	180	229	180	154	127	92	127	154	180
90	7	72	70	43	11	43	70	72	7	72	70	43	11	43	70	72
95	7	20	27	20	6	20	27	20	7	20	27	20	6	20	27	20
100	14	12	16	12	4	12	16	12	14	12	16	12	4	12	16	12
105	15	11	12	10	4	10	12	11	15	11	12	10	4	10	12	11
110	15	11	10	8	4	8	10	11	15	11	10	8	4	8	10	11
115	15	11	11	8	5	8	11	11	15	11	11	8	5	8	11	11
120	17	12	12	9	6	9	12	12	17	12	12	9	6	9	12	12
125	17	13	12	10	7	10	12	13	17	13	12	10	7	10	12	13
130	13	13	13	11	9	11	13	13	13	13	13	11	9	11	13	13
135	14	12	14	12	11	12	14	12	14	12	14	12	11	12	14	12
140	14	13	15	13	12	13	15	13	14	13	15	13	12	13	15	13
145	18	16	15	14	13	14	15	16	18	16	15	14	13	14	15	16
150	19	17	16	15	15	15	16	17	19	17	16	15	15	15	16	17
155	19	18	16	15	15	15	16	18	19	18	16	15	15	15	16	18
160	19	18	16	16	16	16	16	18	19	18	16	16	16	16	16	18
165	18	18	17	16	17	16	17	18	18	18	17	16	17	16	17	18
170	18	18	17	18	17	18	17	18	18	18	17	18	17	18	17	18
175	17	17	18	18	18	18	18	17	17	17	18	18	18	18	18	17
180	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18

Average Luminance (cd/m²)
Horizontal Angle (Degrees)

	0	45	90
0	18820	18820	18820
45	17960	17010	17910
55	16990	16030	11090
65	14680	8034	3710
75	9801	3332	3168
85	4167	2810	1681



Utilization of Lumens - Zonal Cavity Method

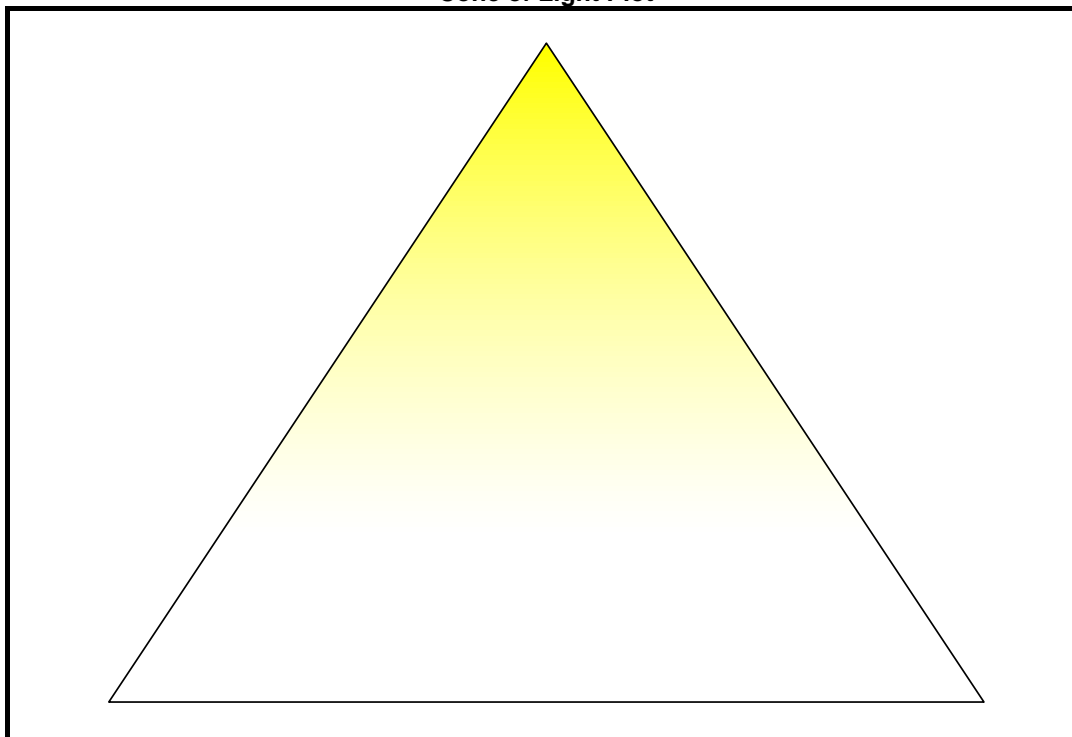
Effective Floor Cavity Reflectance 20%

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	34235	34235	34235	34235	33428	33428	33428	33428	31923	31923	31923	30545	30545	30545	29280	29280	29280	28686
1	31720	30532	29469	28510	30950	29880	28915	28040	28658	27869	27145	27536	26897	26305	26501	25992	25515	24935
2	29144	27032	25285	23815	28410	26493	24890	23529	25481	24137	22976	24547	23430	22449	23684	22765	21945	21356
3	26758	24000	21866	20165	26068	23550	21574	19981	22702	21014	19624	21918	20484	19279	21190	19982	18947	18354
4	24613	21422	19086	17301	23972	21044	18865	17179	20330	18438	16940	19667	18031	16707	19050	17644	16480	15890
5	22702	19236	16813	15026	22113	18916	16642	14941	18311	16310	14775	17748	15992	14613	17223	15687	14454	13873
6	21003	17375	14940	13193	20466	17103	14804	13132	16588	14540	13013	16107	14287	12896	15656	14043	12781	12215
7	19495	15786	13382	11697	19007	15554	13272	11652	15112	13059	11564	14698	12854	11477	14310	12656	11392	10843
8	18159	14424	12075	10461	17715	14224	11985	10427	13843	11811	10361	13486	11642	10295	13150	11479	10230	9700
9	16970	13248	10968	9429	16568	13075	10894	9403	12746	10750	9351	12435	10610	9300	12142	10474	9250	8741
10	15911	12229	10025	8558	15546	12079	9963	8538	11792	9842	8497	11521	9725	8457	11265	9611	8417	7928

Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	741	4.90
6.00	329	7.35
8.00	185	9.80
10.0	119	12.3
12.0	82.3	14.7
14.0	60.5	17.2
16.0	46.3	19.6

Cone of Light Plot





In-Situ Test

In-Situ Test Conditions

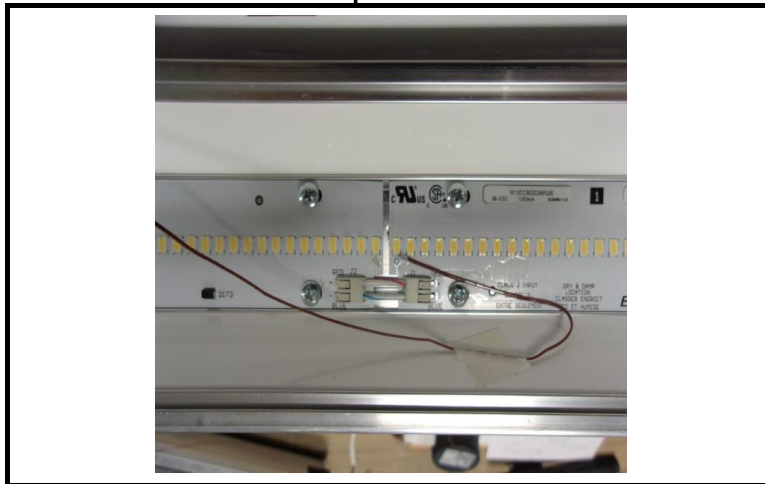
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
23.8 °C	119.2 VAC	N/A	N/A	N/A	60 Hz	N/A

Summary of Results

LED Temperature: 54.2 °C
Driver Temperature: 47.2 °C
Maximum LED Current: 0.1117 A

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

LED Temperature Location



Driver Temperature Location

