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ACCREDITED

NVLAP LAB CODE 201042-0

Photometric Test Report

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

Prepared For

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Catalog Number

B4148SS1B3HXXXX

Order Number
10694920
Test Number
959580

Test Date

2015-03-17 - 2015-03-20

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	22195 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%	52.2%
Zonal Lumen Requirement 2	N/A	N/A
Minimum Luminaire Efficacy	≥77.6 lm/w	127 lm/w
Minimum Lamp Efficacy	N/A	N/A
Alowable CCTs*	≤5700 K	3551 K
Minimum CRI	≥68	84.6
L70 Lumen maintenance	35000 Hours	TM-21 must be completed
Minimum Luminaire Warranty	5 Years	N/A
Power Factor 120 / 277	≥0.87	0.965 at 277 V
Total Harmonic Distortion (A-%)	≤25%	11.5% 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

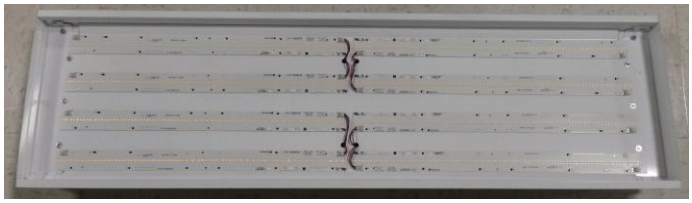
Laboratory results may not be representative of field performance
Ballast factors have not been applied

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 / reflector, no enclosure
Lamp: 768 white LEDs
Mounting: High Bay
Ballast/Driver: Two Everline D23CC90UNVT-F

Luminaire



Luminaire Characteristics

Luminous Length:	48.13	in.
Luminous Width:	12.75	in.

Summary of Results

Integrating Sphere

Total Output:	22800	Lumens
Efficacy:	130.0	lm/w
CCT:	3551	K
CRI (Ra):	84.6	

Distribution

Total Luminaire Output:	22200	Lumens
Luminaire Efficacy:	126.5	lm/w
Maximum Candela:	7964	Candela

Electrical Data at 277 VAC

Test Temperature:	25.8	°C
Voltage:	277.0	VAC
Current:	0.6520	A
Power:	174.3	W
Power Factor:	0.965	
Frequency:	60	Hz
Current THD:	11.5	%

In-Situ

LED Temperature:	51.0	°C
Driver Temperature:	66.7	°C
Maximum LED Current:	0.08110	A

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

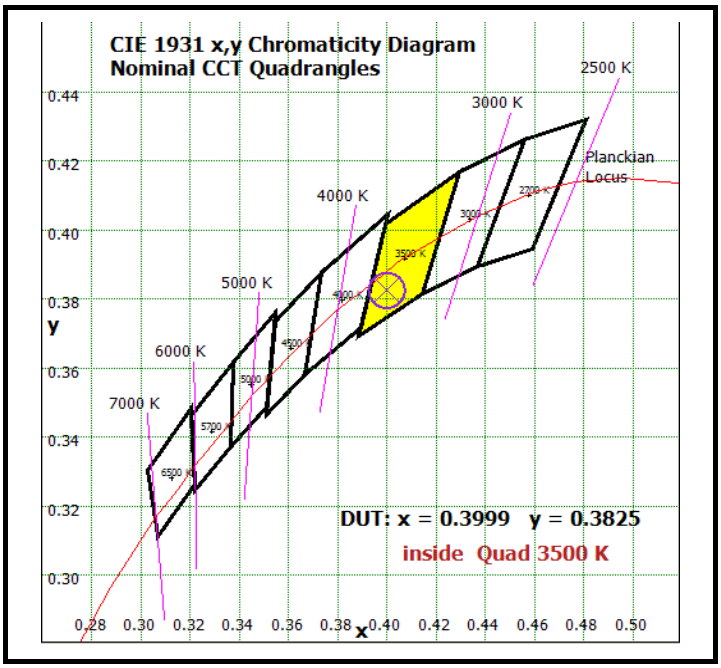
Color Quality - Integrating Sphere

Integrating Sphere Test Conditions

Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
25.7 °C	120.0 VAC	1.465 A	175.4 W	0.997	60 Hz	5.67 %

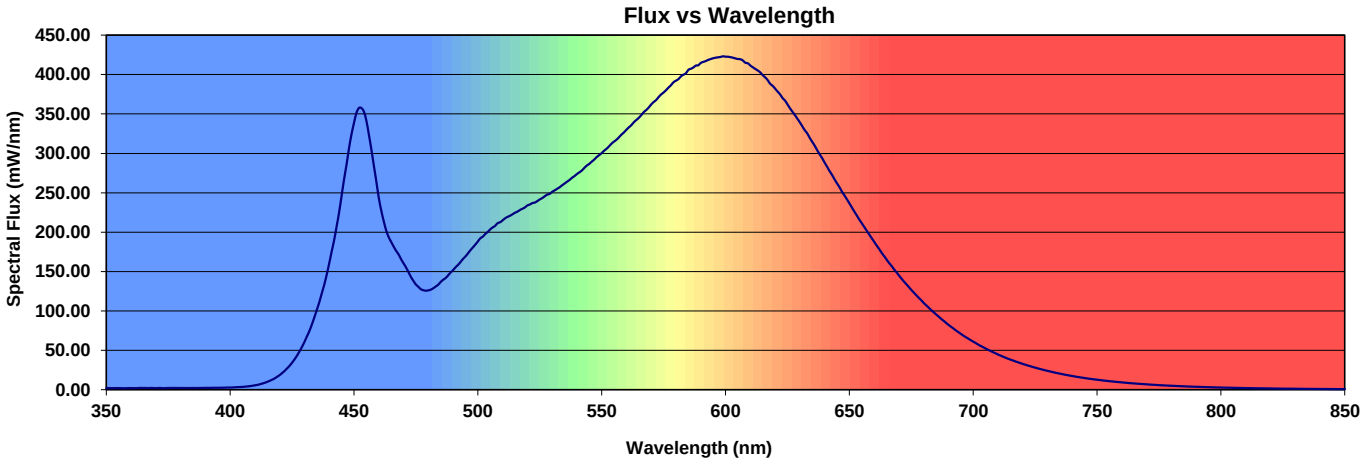
Summary of Results

Luminous Flux:	22800	Lumens
Efficacy:	130.0	lm/w
CCT:	3551	K
CRI (Ra):	84.6	
CRI (R9):	15.3	
Chromaticity (x):	0.3999	
Chromaticity (y):	0.3825	
Chromaticity (u):	0.2356	
Chromaticity (v):	0.3380	
Chromaticity (u'):	0.2356	
Chromaticity (v'):	0.5070	
Duv:	-0.0026	



Color Rendering Index Detail

Ra (CRI)	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
84.6	83.5	92.7	95.8	82.4	84.0	89.8	84.3	64.1	15.3	82.6	81.6	72.5	85.9	98.4



Distribution - Goniophotometer

Distribution Test Conditions

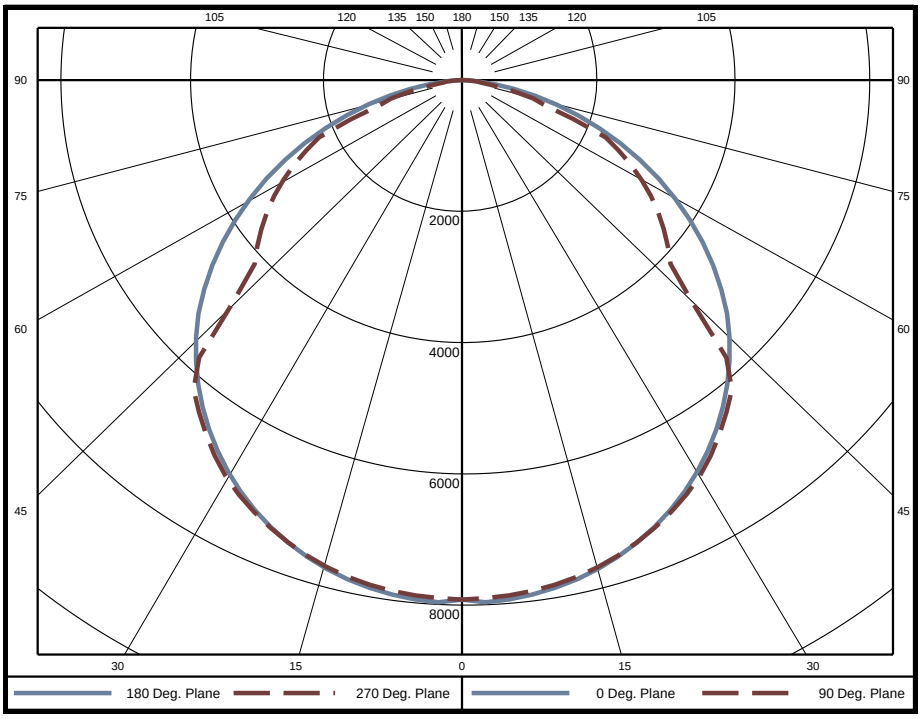
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.7 °C	120.0 VAC	1.465 A	175.4 W	0.998	60 Hz	5.70 %

Summary of Results

Spacing Criteria
0-180: 1.29
90-270: 1.30

Total Lumen Output: 22195 Lumens
Luminaire Efficacy: 126.5 lm/w
Maximum Candela: 7964 Candela

Polar Plot



Zonal Lumen Summary

Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire	Zone	Lumens	% of Luminaire
0-5	200.7	0.9%	60-65	1440.3	6.5%	120-125	0.0	0.0%
5-10	561.4	2.5%	65-70	1173.7	5.3%	125-130	0.0	0.0%
10-15	918.3	4.1%	70-75	797.4	3.6%	130-135	0.0	0.0%
15-20	1248.6	5.6%	75-80	479.6	2.2%	135-140	0.0	0.0%
20-25	1542.1	6.9%	80-85	211.0	1.0%	140-145	0.0	0.0%
25-30	1789.6	8.1%	85-90	57.8	0.3%	145-150	0.0	0.0%
30-35	1982.1	8.9%	90-95	1.8	0.0%	150-155	0.0	0.0%
35-40	2111.0	9.5%	95-100	0.0	0.0%	155-160	0.0	0.0%
40-45	2151.0	9.7%	100-105	0.0	0.0%	160-165	0.0	0.0%
45-50	2018.0	9.1%	105-110	0.0	0.0%	165-170	0.0	0.0%
50-55	1863.8	8.4%	110-115	0.0	0.0%	170-175	0.0	0.0%
55-60	1647.1	7.4%	115-120	0.0	0.0%	175-180	0.0	0.0%

Zone	Lumens	% of Luminaire
0-40	10353.6	46.6%
0-60	18033.6	81.2%
0-90	22193.5	100.0%
90-180	1.8	0.0%

Candela Tabulation

Horizontal Angle (Degrees)

Vertical 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	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915	7915
5	7942	7916	7861	7870	7882	7870	7861	7916	7942	7916	7861	7870	7882	7870	7861	7916
10	7854	7834	7785	7798	7809	7798	7785	7834	7854	7834	7785	7798	7809	7798	7785	7834
15	7709	7693	7651	7669	7683	7669	7651	7693	7709	7693	7651	7669	7683	7669	7651	7693
20	7497	7491	7461	7483	7495	7483	7461	7491	7497	7491	7461	7483	7495	7483	7461	7491
25	7226	7228	7211	7239	7257	7239	7211	7228	7226	7228	7211	7239	7257	7239	7211	7228
30	6891	6905	6897	6952	6968	6952	6897	6905	6891	6905	6897	6952	6968	6952	6897	6905
35	6497	6523	6539	6584	6581	6584	6539	6523	6497	6523	6539	6584	6581	6584	6539	6523
40	6048	6084	6129	6145	6155	6145	6129	6084	6048	6084	6129	6145	6155	6145	6129	6084
45	5542	5588	5628	5434	4756	5434	5628	5588	5542	5588	5628	5434	4756	5434	5628	5588
50	4958	5044	5090	3930	3939	3930	5090	5044	4958	5044	5090	3930	3939	3930	5090	5044
55	4304	4434	3776	3498	3510	3498	3776	4434	4304	4434	3776	3498	3510	3498	3776	4434
60	3602	3738	2968	3028	3038	3028	2968	3738	3602	3738	2968	3028	3038	3028	2968	3738
65	2875	3007	2440	2521	2532	2521	2440	3007	2875	3007	2440	2521	2532	2521	2440	3007
70	2139	1878	1882	1928	1741	1928	1882	1878	2139	1878	1882	1928	1741	1928	1882	1878
75	1425	1238	1260	1077	1081	1077	1260	1238	1425	1238	1260	1077	1081	1077	1260	1238
80	772	724	631	493	455	493	631	724	772	724	631	493	455	493	631	724
85	243	219	191	215	214	215	191	219	243	219	191	215	214	215	191	219
90	8	10	14	16	17	16	14	10	8	10	14	16	17	16	14	10
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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^2)

Horizontal Angle (Degrees)

Vertical Angle (Degrees)	0	45	90
0	20000	20000	20000
45	19800	20100	16990
55	18960	16630	15460
65	17190	14580	15130
75	13900	12300	10550
85	7051	5535	6201

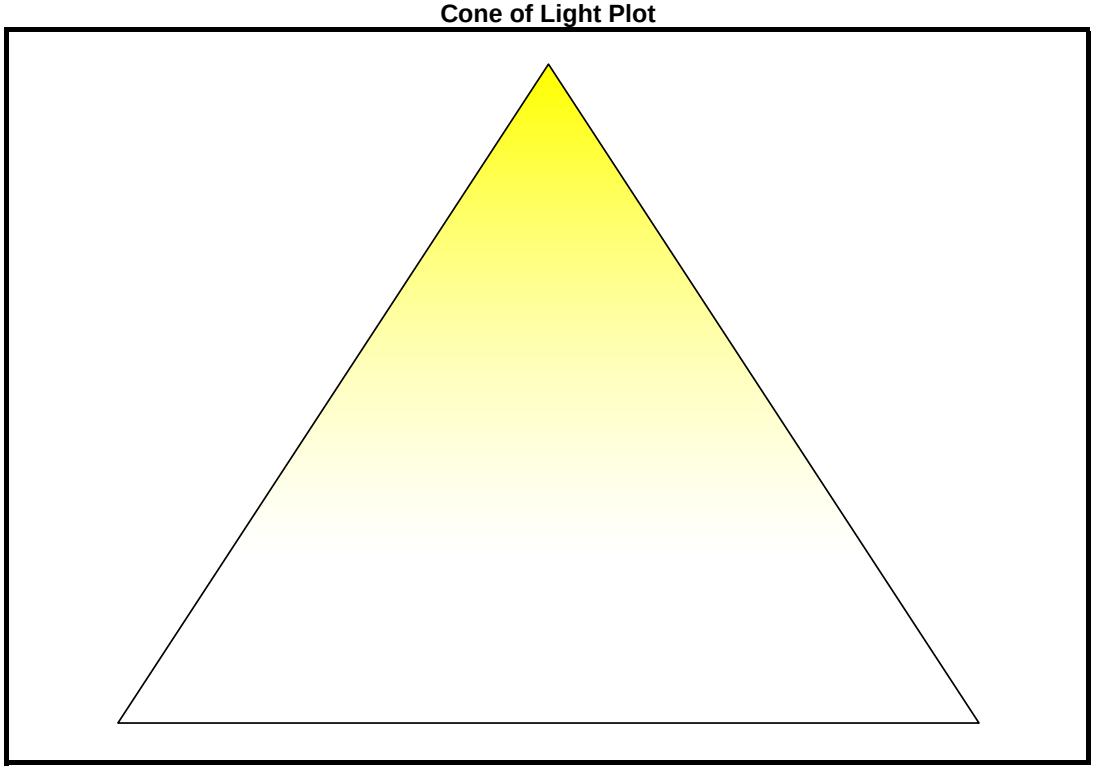
Utilization of Lumens - Zonal Cavity Method

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	26428	26428	26428	26428	25813	25813	25813	25813	24666	24666	24666	23616	23616	23616	22652	22652	22652	22199
1	24259	23247	22340	21522	23660	22745	21920	21171	21805	21126	20504	20941	20388	19877	20145	19702	19288	18829
2	22112	20337	18868	17633	21534	19919	18569	17422	19135	17999	17017	18412	17464	16630	17743	16960	16261	15788
3	20184	17895	16124	14713	19638	17545	15903	14580	16887	15480	14321	16278	15079	14072	15712	14699	13831	13352
4	18491	15873	13956	12491	17984	15579	13788	12404	15024	13466	12232	14508	13159	12065	14029	12866	11903	11427
5	17009	14191	12221	10767	16545	13942	12091	10707	13473	11841	10589	13035	11600	10474	12627	11371	10361	9894
6	15708	12779	10814	9403	15285	12569	10711	9360	12169	10512	9277	11796	10321	9194	11447	10137	9113	8659
7	14563	11586	9657	8304	14179	11406	9574	8273	11065	9414	8212	10744	9259	8151	10444	9110	8092	7653
8	13554	10571	8695	7406	13207	10417	8627	7382	10123	8496	7336	9847	8370	7290	9587	8247	7245	6824
9	12661	9699	7885	6661	12346	9566	7830	6643	9312	7722	6607	9073	7617	6572	8847	7515	6537	6133
10	11867	8946	7198	6035	11582	8831	7152	6021	8610	7062	5993	8402	6974	5966	8205	6889	5939	5552

Cone of Light Tabulation

Mounting Height (Feet)	Footcandles at Nadir	Diameter (Feet)
4.00	495	5.19
6.00	220	7.79
8.00	124	10.4
10.0	79.2	13.0
12.0	55.0	15.6
14.0	40.4	18.2
16.0	30.9	20.8

Cone of Light Plot



In-Situ Test

In-Situ Test Conditions

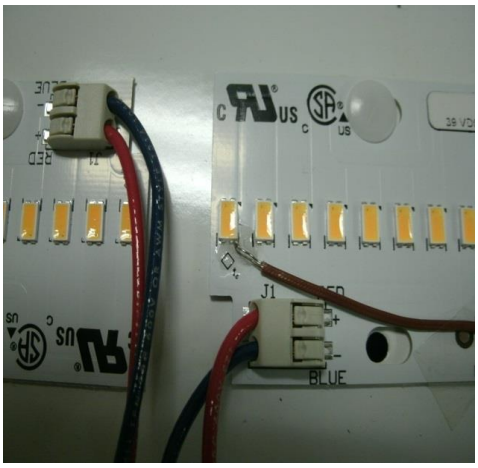
Temperature	Voltage	Current	Power	Power Factor	Frequency	Current THD
24.8 °C	118.6 VAC	N / A	N / A	N / A	60 Hz	N / A

Summary of Results

LED Temperature:	51.0 °C
Driver Temperature:	66.7 °C
Maximum LED Current:	0.08110 A

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

LED Temperature Location



Driver Temperature Location