FOR THE SCOPE OF ACCREDITATION UNDER NVLAP LAB CODE 100402-0.

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G101526677 Date: February 13, 2014

REPORT NO. 101526677CRT-010

TEST OF ONE 6 INCH EYEBALL LED DOWNLIGHT

MODEL NO. D6-L1200-C30-EB

RENDERED TO

VERBATIM AMERICAS
1200 WT HARRIS BLVD.
CHARLOTTE, NC 28262

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500504566.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number D6-L1200-C30-EB. The sample was received by Intertek on February 4, 2014, in undamaged condition and one sample was tested as received. The sample designation was CRT1402041126-001-10.

DATES OF TESTS: February 11, 2014.

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SUMMARY

Model No.:	D6-L1200-C30-EB
Description:	6 INCH EYEBALL LED DOWNLIGHT

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1238	1228
Total Power (W)	18.07	18.11
Luminaire Efficacy (LPW)	68.51	67.81

Criteria	Result
Power Factor	0.992
Current ATHD %	10.22
Correlated Color Temperature (CCT - K)	3026
Color Rendering Index (CRI - Ra)	82.5
Color Rendering Index (CRI - R9)	19.2
DUV	0.002
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.399
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.519

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
2 Meter Integ. Sphere	---	N308	VBU	VBU
Diode Array	CBS 600	W/N308	01/29/14	02/28/14
Power Analyzer	2503AH	E235	06/10/13	06/10/14
Temp Meter	53II	D588	03/15/13	03/15/14
Hygro-Thermometer	445703	T1366	11/27/13	11/27/14
AC power supply	CW1251	---	VBU	VBU
LSI High Speed Mirror Goniometer	6440	---	01/24/14	02/24/14
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	04/17/13	04/17/14
ExTech Hygro Thermometer	445703	T1357	11/25/13	11/25/14
Fisher Scientific	14-649-9	N1405	08/13/13	08/13/14
M-D Building Products	Smart Tool	L112	02/13/13	02/13/14

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

Photometric and Electrical Measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

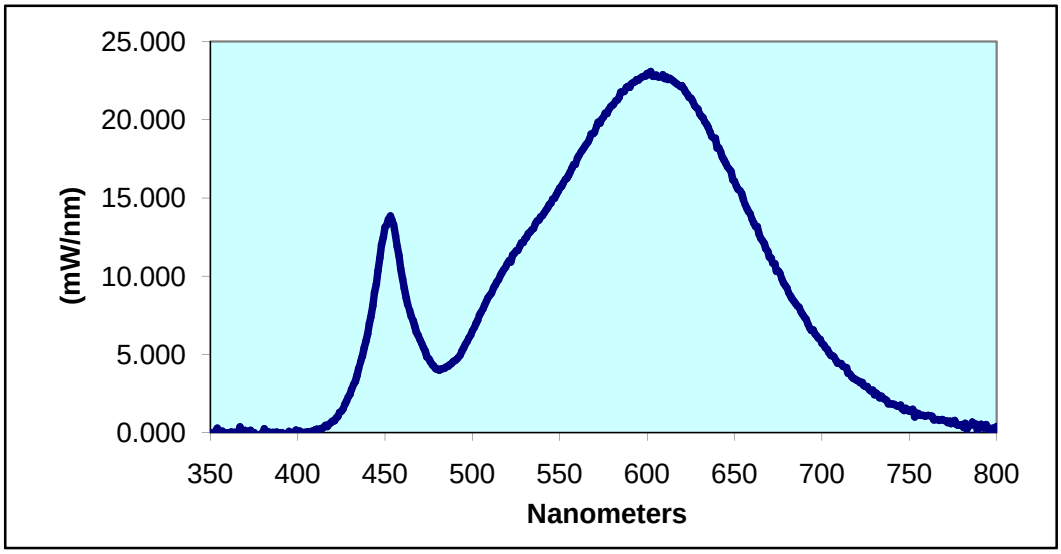
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
CRT1402041126-001-10	UP	120.0	151.5	18.07	0.992	10.22	1238	68.51

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3026	82.5	19.2	0.002	0.433	0.399	0.250	0.519

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.020	440	6.312	530	12.37	620	22.17	710	4.418
355	0.000	445	9.494	535	13.02	625	21.36	715	3.786
360	0.005	450	13.140	540	13.87	630	20.37	720	3.341
365	0.000	455	13.290	545	14.68	635	19.48	725	2.938
370	0.143	460	9.820	550	15.63	640	18.17	730	2.420
375	0.000	465	7.432	555	16.41	645	17.21	735	2.193
380	0.000	470	5.948	560	17.53	650	16.06	740	1.812
385	0.002	475	4.732	565	18.41	655	14.87	745	1.767
390	0.000	480	4.066	570	19.20	660	13.63	750	1.372
395	0.090	485	4.198	575	20.16	665	12.42	755	1.221
400	0.000	490	4.601	580	20.90	670	11.20	760	1.090
405	0.000	495	5.410	585	21.76	675	10.32	765	0.846
410	0.178	500	6.496	590	22.07	680	9.250	770	0.785
415	0.356	505	7.693	595	22.51	685	8.232	775	0.730
420	0.742	510	8.787	600	22.95	690	7.361	780	0.517
425	1.372	515	9.769	605	22.85	695	6.558		
430	2.455	520	10.790	610	22.63	700	5.716		
435	4.128	525	11.610	615	22.45	705	4.938		

Spectral Data Over Visible Wavelengths



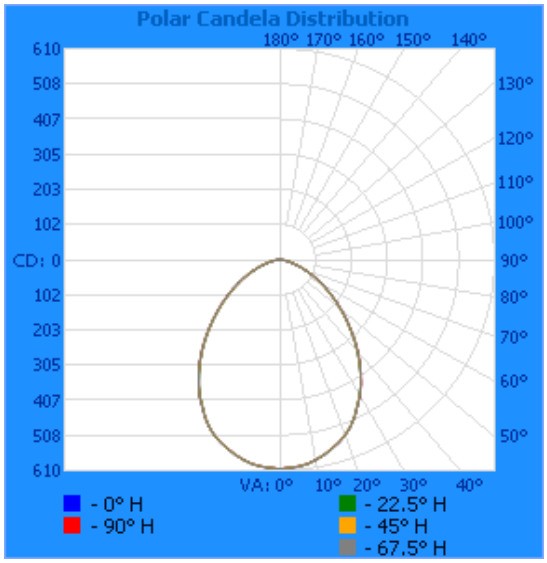
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
CRT1402041126-001-10	UP	120.1	152.0	18.11	0.993	1228	67.81

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	604	604	604	604	604
5	601	600	600	600	600
10	588	588	588	587	587
15	567	567	566	566	566
20	541	541	541	541	540
25	502	501	502	502	502
30	454	454	454	455	455
35	400	399	399	401	401
40	342	342	342	343	344
45	284	283	284	285	286
50	230	229	229	230	231
55	180	179	179	180	181
60	136	136	135	136	136
65	97	97	97	97	98
70	64	65	65	64	65
75	38	39	39	39	39
80	21	22	22	22	22
85	12	12	12	11	11
90	0	0	0	0	0

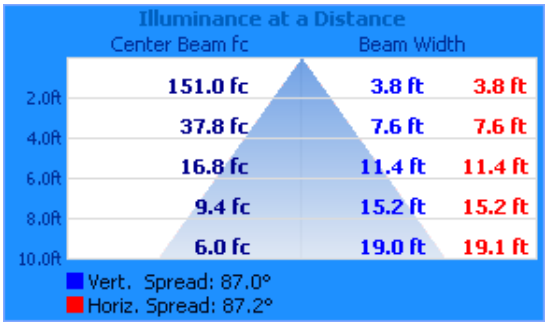


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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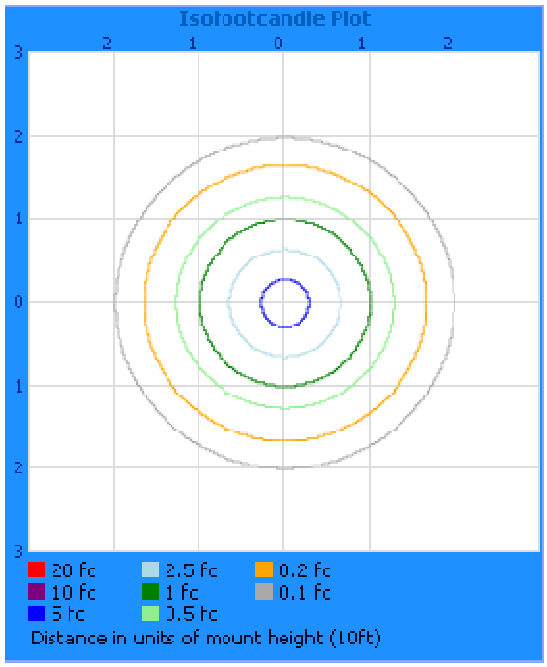

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	446.5	36.3
0-40	696.0	56.7
0-60	1077	87.7
60-90	151.5	12.3
0-90	1228	100.0
90-180	0.0	0.0
0-180	1228	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	56.9	4.6
10-20	159.7	13.0
20-30	229.9	18.7
30-40	249.5	20.3
40-50	219.5	17.9
50-60	161.3	13.1
60-70	97.1	7.9
70-80	42.5	3.5
80-90	11.9	1.0

PICTURE (not to scale)

CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

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Lighting Division

Report Reviewed By:

Kenda Branch
Project Engineer
Lighting Division

Attachment: None