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

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G101936679 Date: September 4, 2015

REPORT NO. 101936679CRT-087

TEST OF ONE BR30 LED 2700K

LAMP MODEL NO.: LED BR30 R30-L850-C30-U
PART NO.: 99254

RENDERED TO

VERBATIM AMERICAS
1200 W.T. HARRIS BLVD.
CHARLOTTE, NC 28269

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 500565507.

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: 2011: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number LED BR30 R30-L850-C30-U. The sample was received by Intertek on August 25, 2015, in undamaged condition and one sample was tested as received. The sample designation was CRT1508251248-002-4.

DATES OF TESTS: August 27, 2015 through September 4, 2015.

SUMMARY

Lamp Model No.:	LED BR30 R30-L850-C30-U
Part No.:	99254
Description:	BR30 LED 2700K

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	920.6	939.8
Total Power (W)	11.24	11.26
Luminaire Efficacy (LPW)	81.93	83.46

Criteria	Result
Power Factor	0.958
Current ATHD %	25.96
Correlated Color Temperature (CCT - K)	3092
Color Rendering Index (CRI - Ra)	82.6
Color Rendering Index (CRI - R9)	10.0
DUV	0.001
Chromaticity Coordinate (x)	0.430
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.248
Chromaticity Coordinate (v')	0.519

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
LSI High Speed Mirror Goniometer	6440	---	08/10/15	09/10/15	09/04/15
Elgar AC Power Supply	CW1251	---	VBU	VBU	09/04/15
Sorenson DC Power Supply	XG 150-10	---	VBU	VBU	09/04/15
Yokogawa Power Analyzer	WT210	E464	04/20/15	04/20/16	09/04/15
ExTech Hygro Thermometer	445703	T1357	12/10/14	12/10/15	09/04/15
M-D Building Products Digital Level	Smart Tool	L112	03/25/15	03/25/16	09/04/15
NIST Luminous Intensity Standard Source	NBS10322	N1427	12/12/14	12/12/15	09/04/15
NIST Luminous Intensity Standard Source	NBS10215	N1432	12/12/14	12/12/15	09/04/15
NIST Luminous Intensity Standard Source	H754	N1433	12/12/14	12/12/15	09/04/15
NIST Luminous Flux Standard Source	NBS10428	N1424	12/17/14	12/17/15	09/04/15
2M Integrating Sphere Spectrometer Sy	CDS 600	W/N308	07/29/15	08/29/15	08/27/15
Yokogawa Power Analyzer	WT1600	E473	04/22/15	04/22/16	08/27/15
Extech Hygro-Thermometer	445703	T1359	12/10/14	12/10/15	08/27/15
Fisher Scientific Stopwatch	14-649-9	N1316	12/10/14	12/10/15	08/27/15
Sorensen DC Power Supply	XFR 35-35	---	VBU	VBU	08/27/15
Xantrex DC Power Supply	XTR 150-5.6	---	VBU	VBU	08/27/15
Elgar AC Power Supply	CW1251	---	VBU	VBU	08/27/15
NIST Spectral Flux Standard Source	RF1482	N1422	12/17/14	100 Hrs of use	08/27/15
NIST Luminous Flux Standard Source	150-14	N1423	12/17/14	12/17/15	08/27/15
NIST Luminous Flux Standard Source	NBS10428	N1424	12/17/14	12/17/15	08/27/15
NIST Luminous Flux Standard Source	BS8830	N1425	12/17/14	12/17/15	08/27/15

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 600 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

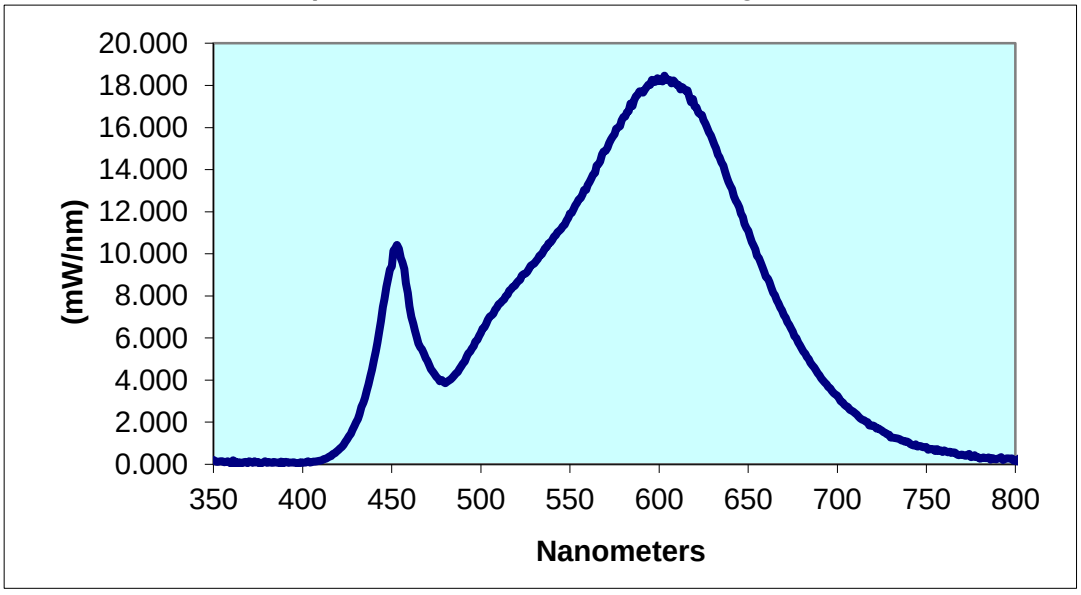
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
CRT1508251248-002-4	UP	120.0	97.74	11.24	0.958	25.96	920.6	81.93

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3092	82.6	10.0	0.001	0.430	0.400	0.248	0.519

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.207	440	4.950	530	9.536	620	17.01	710	2.420
355	0.142	445	7.477	535	10.11	625	16.35	715	2.093
360	0.023	450	9.409	540	10.65	630	15.42	720	1.839
365	0.077	455	9.790	545	11.17	635	14.34	725	1.594
370	0.145	460	7.494	550	11.91	640	13.22	730	1.272
375	0.115	465	5.736	555	12.57	645	12.19	735	1.195
380	0.067	470	4.915	560	13.27	650	11.08	740	1.044
385	0.083	475	4.155	565	14.20	655	9.901	745	0.842
390	0.115	480	3.847	570	14.88	660	8.906	750	0.806
395	0.091	485	4.221	575	15.68	665	8.027	755	0.621
400	0.057	490	4.786	580	16.50	670	7.092	760	0.660
405	0.101	495	5.489	585	17.02	675	6.297	765	0.562
410	0.177	500	6.246	590	17.72	680	5.500	770	0.464
415	0.364	505	7.016	595	18.02	685	4.823	775	0.346
420	0.671	510	7.607	600	18.21	690	4.232	780	0.268
425	1.181	515	8.057	605	18.28	695	3.669		
430	1.975	520	8.615	610	18.02	700	3.263		
435	3.150	525	9.050	615	17.74	705	2.762		

Spectral Data Over Visible Wavelengths



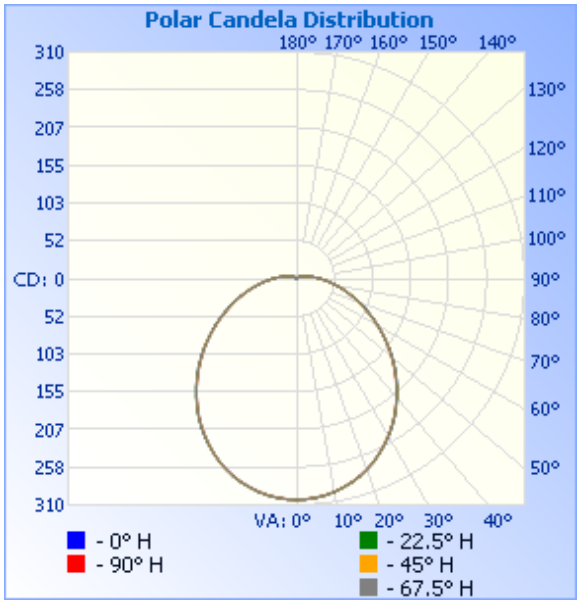
RESULTS OF TEST (cont'd)

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)
CRT1508251248-002-4	UP	120.0	97.87	11.26	0.958	939.8	83.46

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	303	303	303	303	303
5	301	301	301	301	301
10	296	296	296	296	296
15	289	289	289	289	288
20	278	279	278	278	278
25	265	265	265	265	264
30	249	249	249	249	249
35	232	232	231	231	231
40	212	212	212	211	211
45	192	191	191	191	190
50	170	170	170	169	169
55	148	148	148	147	148
60	128	127	127	127	126
65	108	107	106	106	105
70	88	88	88	88	88
75	71	71	71	71	71
80	56	56	56	56	56
85	43	43	43	43	43
90	32	32	32	32	32
95	24	24	24	24	24
100	17	17	17	17	17
105	13	13	13	13	13
110	10	10	10	10	10
115	7	7	7	7	7
120	6	6	6	6	6
125	4	4	4	4	4
130	3	3	3	3	3
135	3	3	3	3	3
140	2	2	2	2	2
145	1	1	1	1	1
150	1	1	1	1	1
155	1	1	1	1	1

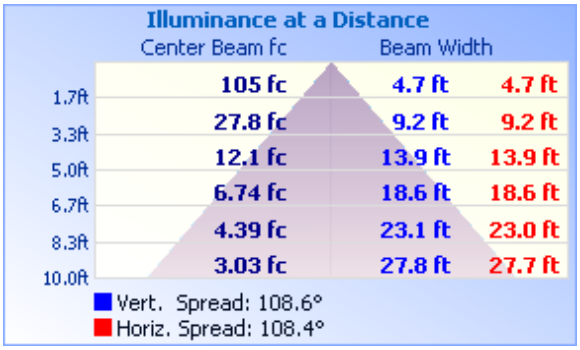


RESULTS OF TEST (cont'd)

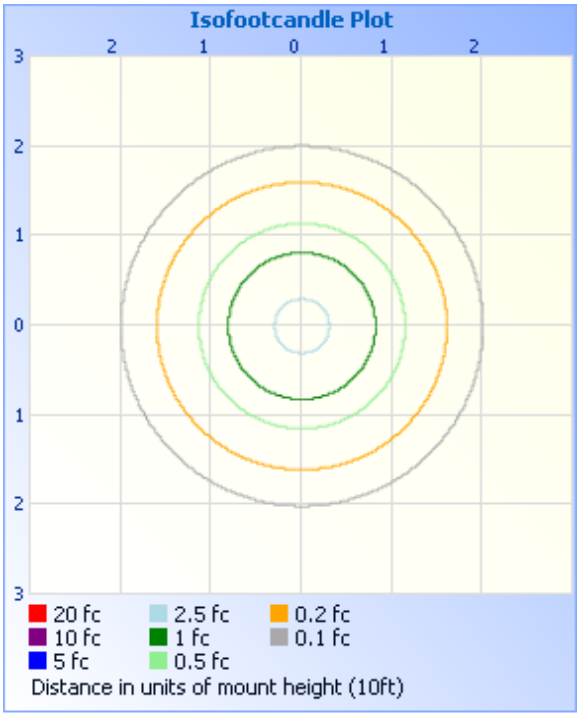
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	231.9	24.7
0-40	376.5	40.1
0-60	656.4	69.8
60-90	228.5	24.3
0-90	884.9	94.2
90-180	54.9	5.8
0-180	939.8	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	28.6	3.0
10-20	81.4	8.7
20-30	121.9	13.0
30-40	144.6	15.4
40-50	147.3	15.7
50-60	132.5	14.1
60-70	105.8	11.3
70-80	75.3	8.0
80-90	47.4	5.0
90-100	26.4	2.8
100-110	13.7	1.5
110-120	7.4	0.8
120-130	4.1	0.4
130-140	2.0	0.2
140-150	0.9	0.1
150-160	0.3	0.0
160-170	0.1	0.0

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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Report Reviewed By:

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Ryan Siddon
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Attachment: None