



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

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G101586759

Date: April 18, 2014

REPORT NO. 101586759CRT-006

TEST OF ONE LED BR40 LAMP

MODEL NO. B40-L685-C30-W

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 500517767.

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 B40-L685-C30-W. The sample was received by Intertek on April 7, 2014, in undamaged condition and one sample was tested as received. The sample designation was CRT1404071324-001-2.

DATES OF TESTS: April 10, 2014 through April 15, 2014.

SUMMARY

Model No.:	B40-L685-C30-W
Description:	LED BR40 lamp

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	777.4	769.9
Total Power (W)	9.66	9.70
Lamp Efficacy (LPW)	80.48	79.37

Criteria	Result
Power Factor	0.896
Current ATHD %	41.04
Correlated Color Temperature (CCT - K)	3028
Color Rendering Index (CRI - Ra)	82.3
Color Rendering Index (CRI - R9)	18.2
DUV	0.000
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.520

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
ITS 2 Meter Integ. Sphere	---	N308	VBU	VBU
Labsphere Diode Array	CDS 600	W/N308	03/31/14	05/01/14
Xitron Power Analyzer	2503AH	E235	05/10/13	05/10/14
Fluke Temp Meter	52 k/j	T801	10/23/13	10/23/14
Cole-Parmer Hygro-Thermometer	445703	T1366	11/27/13	11/27/14
Elgar AC power supply	CW1251	---	VBU	VBU
Intensity Standard	---	BS5186	05/01/13	05/01/14
SECONDARY LM STD. #1	---	882295	05/01/13	05/01/14
SECONDARY LM STD. #2	---	BS4743	05/01/13	05/01/14
SECONDARY LM STD. #3	---	BS3616	05/01/13	05/01/14
LSI High Speed Mirror Goniometer	6440	---	03/25/14	04/25/14
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	03/14/14	03/15/15



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 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

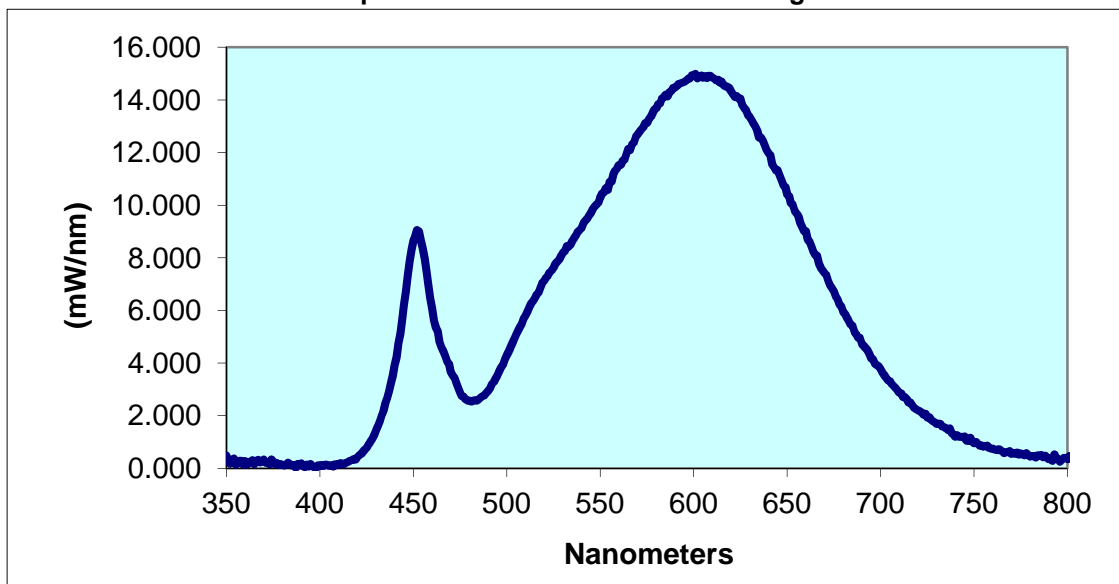
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
CRT1404071324-001-2	UP	120.0	90.00	9.66	0.896	41.04	777.4	80.48

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')
3028	82.3	18.2	0.000	0.434	0.402	0.250	0.520

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.485	440	3.919	530	8.194	620	14.33	710	2.872
355	0.143	445	6.213	535	8.646	625	14.05	715	2.495
360	0.274	450	8.659	540	9.123	630	13.35	720	2.210
365	0.149	455	8.348	545	9.697	635	12.57	725	1.925
370	0.333	460	6.082	550	10.30	640	11.99	730	1.681
375	0.250	465	4.606	555	10.89	645	11.32	735	1.527
380	0.139	470	3.677	560	11.52	650	10.41	740	1.199
385	0.098	475	2.863	565	12.15	655	9.692	745	1.213
390	0.190	480	2.572	570	12.68	660	9.020	750	0.956
395	0.164	485	2.615	575	13.13	665	8.118	755	0.820
400	0.071	490	2.938	580	13.69	670	7.418	760	0.743
405	0.092	495	3.532	585	14.21	675	6.717	765	0.647
410	0.171	500	4.313	590	14.47	680	5.942	770	0.545
415	0.230	505	5.088	595	14.69	685	5.416	775	0.562
420	0.420	510	5.804	600	14.96	690	4.738	780	0.444
425	0.776	515	6.458	605	14.84	695	4.170		
430	1.437	520	7.118	610	14.86	700	3.761		
435	2.471	525	7.627	615	14.70	705	3.307		

Spectral Data Over Visible Wavelengths



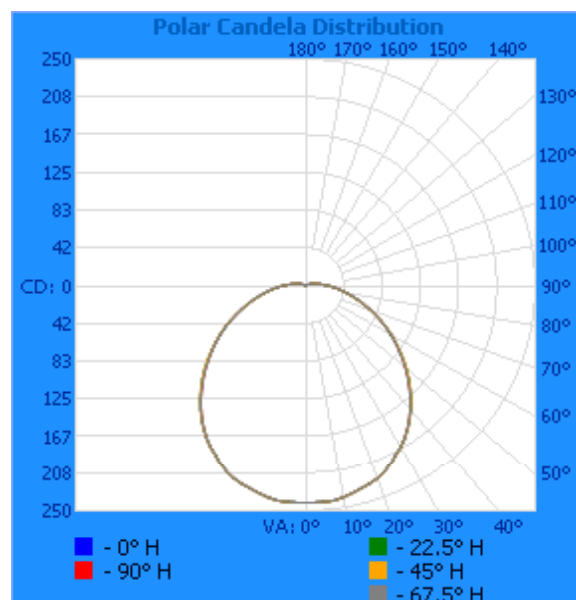
RESULTS OF TEST (cont'd)

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)
CRT1404071324-001-2	UP	120.0	89.85	9.70	0.899	769.9	79.37

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	241	241	241	241	241
5	241	241	241	241	241
10	238	238	239	239	239
15	233	233	233	233	233
20	228	228	228	228	228
25	218	218	218	218	218
30	206	206	207	206	206
35	193	193	194	193	193
40	178	178	178	177	177
45	161	161	161	160	160
50	143	143	144	142	142
55	125	125	126	124	124
60	107	107	108	107	107
65	90	90	90	90	90
70	73	73	73	74	73
75	58	58	58	58	58
80	46	45	45	45	45
85	35	34	34	34	34
90	25	25	25	25	25
95	18	18	18	18	18
100	12	12	12	12	12
105	8	8	8	8	8
110	6	6	6	6	6
115	4	4	4	4	4
120	3	3	3	3	3
125	2	2	2	2	2
130	1	1	1	1	1

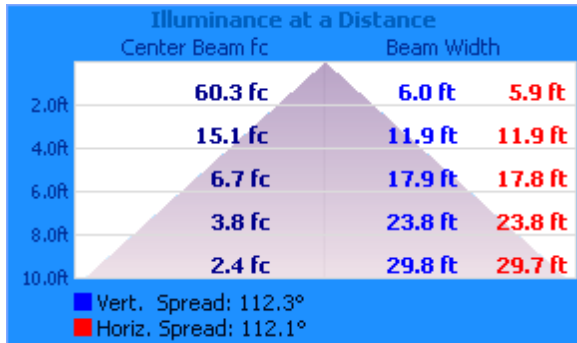


RESULTS OF TEST (cont'd)

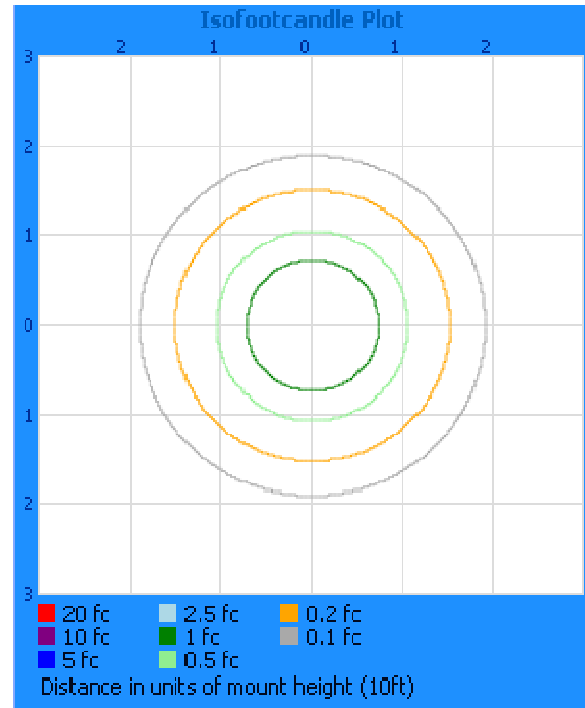
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	189.4	24.6
0-40	310.1	40.3
0-60	545.8	70.9
60-90	188.8	24.5
0-90	734.5	95.4
90-180	35.3	4.6
0-180	769.9	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	22.9	3.0
10-20	66.0	8.6
20-30	100.5	13.1
30-40	120.7	15.7
40-50	123.9	16.1
50-60	111.8	14.5
60-70	89.2	11.6
70-80	61.9	8.0
80-90	37.7	4.9
90-100	19.9	2.6
100-110	9.2	1.2
110-120	4.2	0.5
120-130	1.7	0.2
130-140	0.4	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.

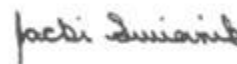
In Charge Of Tests:



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Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



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