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-075

TEST OF ONE DISK LIGHT LED 3000K

MODEL NO. D6-L740-C30-DSK
PART NO. 99001

RENDERED TO:

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

TESTS: 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:

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 D6-L740-C30-DSK. The sample was received by Intertek on August 18, 2015 in undamaged condition and one sample was tested as received. The sample designation was CRT1508181209-001B.

DATE OF TESTS: August 24, 2015 through September 4, 2015.

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SUMMARY:

MODEL NO. D6-L740-C30-DSK
PART NO. 99001
DESCRIPTION: Disk Light LED 3000K

Criteria	Integrating Sphere	Goniophotometer
Light Output (Lumens)	810.4	809.5
Total Power (W)	11.85	11.82
Lumen Efficacy (Lm/W)	68.40	68.49
Power Factor ( )	0.992	0.992

Criteria	Results
Current ATHD (%)	11.71
Correlated Color Temp. (CCT-K)	3072
Color Rendering Index (CRI - Ra)	85.7
CRI - R9	22.2
DUV ( )	0.001
Chromaticity Coordinate (x)	0.430
Chromaticity Coordinate (y)	0.399
Chromaticity Coordinate (u')	0.248
Chromaticity Coordinate (v')	0.519

EQUIPMENT LIST

Equipment Used	Model No.	Control No.	Last Cal.	Cal. Due
LSI High Speed Mirror Goniometer	6440	---	8/10/2015	9/10/2015
Elgar AC Power Supply	CW1251	---	VBU	VBU
Sorenson DC Power Supply	XG 150-10	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	4/20/2015	4/20/2016
ExTech Hygro Thermometer	445703	T1357	12/10/2014	12/10/2015
M-D Building Products Digital Level	Smart Tool	L112	3/25/2015	3/25/2016
NIST Luminous Intensity Standard Source	NBS10322	N1427	12/12/2014	12/12/2015
NIST Luminous Intensity Standard Source	NBS10215	N1432	12/12/2014	12/12/2015
NIST Luminous Intensity Standard Source	H754	N1433	12/12/2014	12/12/2015
NIST Luminous Flux Standard Source	NBS10428	N1424	12/17/2014	12/17/2015
2M Integrating Sphere Spectrometer System	CDS 600	W/N308	7/29/2015	8/29/2015
Yokogawa Power Analyzer	WT1600	E473	4/22/2015	4/22/2016
Extech Hygro-Thermometer	445703	T1359	12/10/2014	12/10/2015
Fisher Scientific Stopwatch	14-649-9	N1316	12/10/2014	12/10/2015
Sorensen DC Power Supply	XFR 35-35	---	VBU	VBU
Xantrex DC Power Supply	XTR 150-5.6	---	VBU	VBU
Elgar AC Power Supply	CW1251	---	VBU	VBU
NIST Spectral Flux Standard Source	RF1482	N1422	12/17/2014	100 Hrs of use
NIST Luminous Flux Standard Source	150-14	N1423	12/17/2014	12/17/2015
NIST Luminous Flux Standard Source	NBS10428	N1424	12/17/2014	12/17/2015
NIST Luminous Flux Standard Source	BS8830	N1425	12/17/2014	12/17/2015

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. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a 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 the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

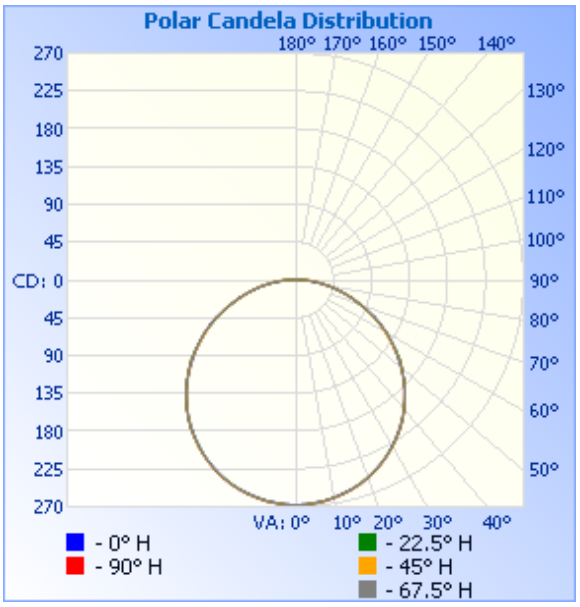
RESULTS:

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

Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Light Output (Lumens)	Lumen Efficacy (lm/W)
CRT1508181209-001B	Base Up	120.0	99.30	11.82	0.992	809.5	68.49

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	267	267	267	267	267
5	266	266	266	267	267
10	262	263	263	263	263
15	257	258	258	258	258
20	250	250	250	250	250
25	240	240	241	240	241
30	228	228	229	229	229
35	215	216	215	215	216
40	200	200	200	200	200
45	183	183	183	183	183
50	163	164	164	165	164
55	144	145	144	144	143
60	123	123	122	124	123
65	103	101	101	102	101
70	78	79	80	81	79
75	58	59	58	59	60
80	40	40	41	40	40
85	23	24	26	24	23
90	10	13	14	13	10
95	3	5	7	5	3
100	0	1	2	1	0

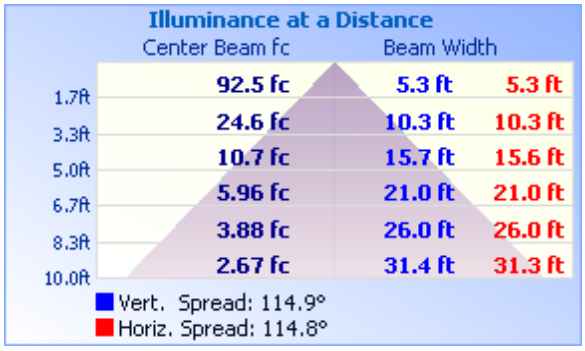


RESULTS:

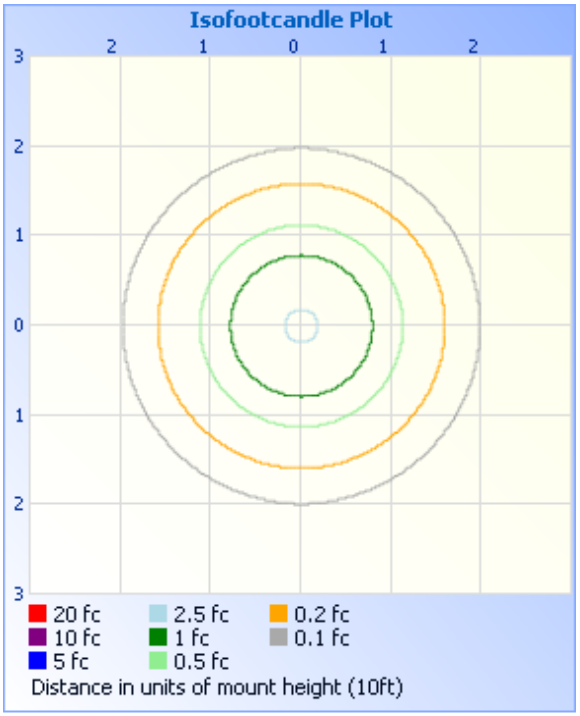
Illumination Plots

Mounting Height: 10 Feet

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	208.9	25.8
0-40	343.5	42.4
0-60	613.1	75.7
60-90	190.1	23.5
0-90	803.2	99.2
90-180	6.3	0.8
0-180	809.5	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	25.3	3.1
10-20	72.7	9.0
20-30	110.8	13.7
30-40	134.6	16.6
40-50	140.9	17.4
50-60	128.7	15.9
60-70	100.3	12.4
70-80	62.4	7.7
80-90	27.4	3.4
90-100	6.2	0.8
100-110	0.1	0.0

RESULTS:

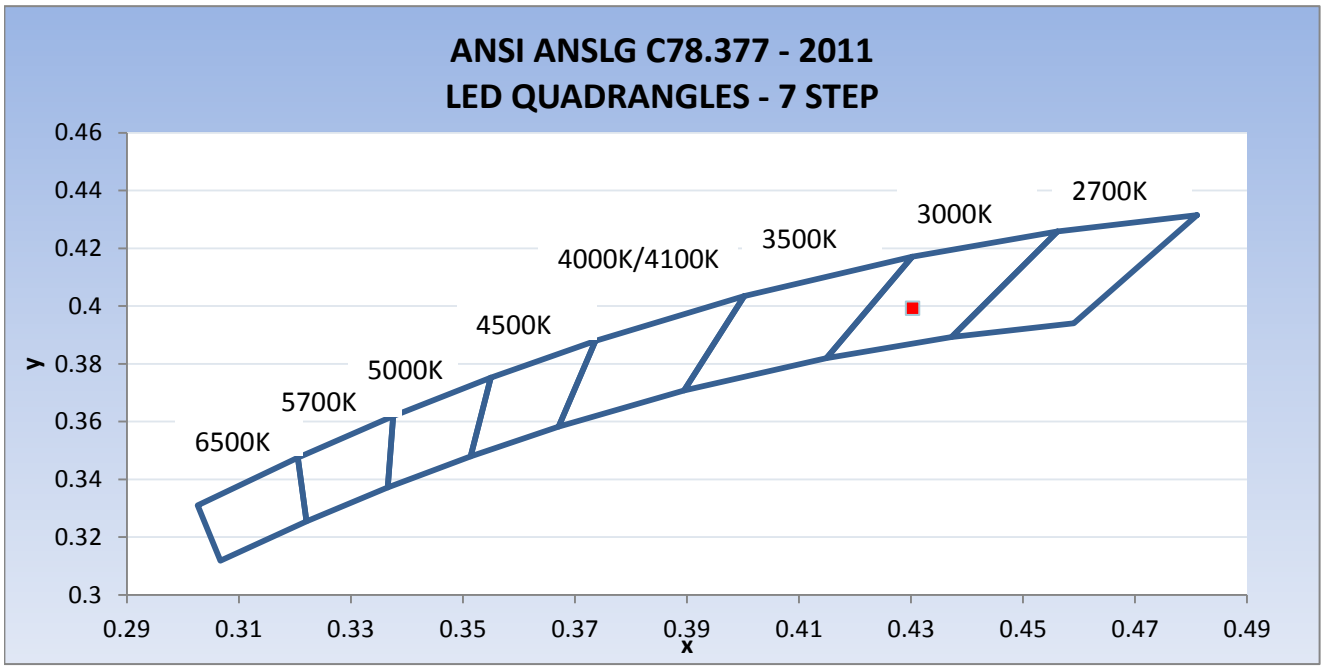
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Sphere Method

Intertek Control No.	Base Orientation	Input Voltage (VAC)	Input Current (mA)	Input Power (W)	Input Power Factor ( )	Current ATHD (%)
CRT1508181209-001B	Base Up	120.0	99.52	11.85	0.992	11.71

Light Output (Lumens)	Lumen Efficacy (lm/W)	Correlated Color Temperature - CCT (K)	CRI -Ra	CRI -R9	DUV ( )
810.4	68.40	3072	85.7	22.2	0.001

CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
0.430	0.399	0.248	0.519

ANSI C78.377 SSL Chromaticity (2011 Version)

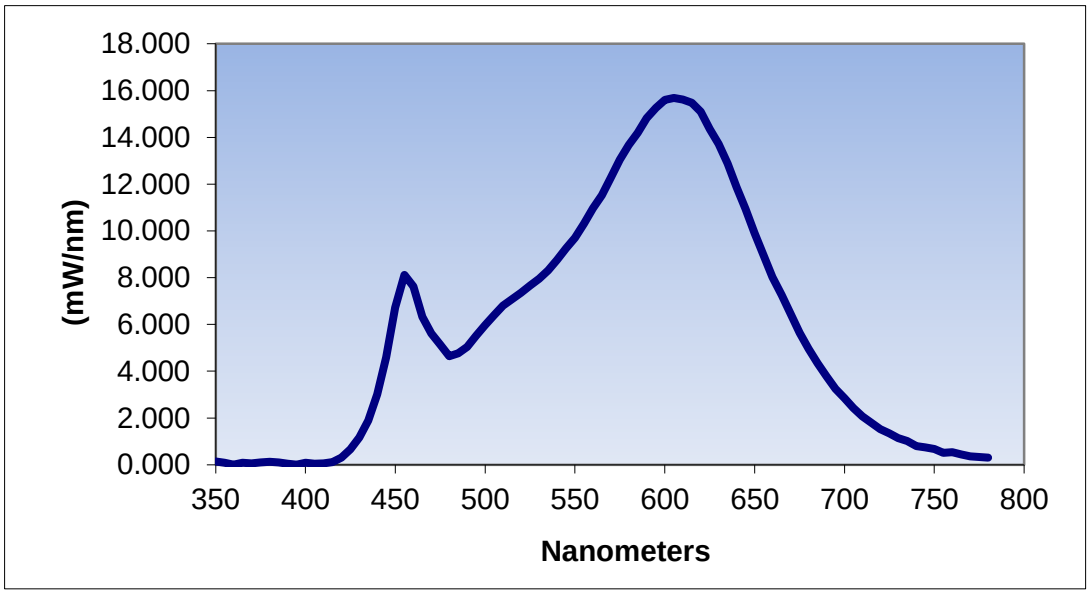


RESULTS:

Spectral Distribution Over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.142	460	7.633	570	12.28	680	4.953
355	0.081	465	6.323	575	13.04	685	4.336
360	0.001	470	5.609	580	13.68	690	3.779
365	0.085	475	5.132	585	14.20	695	3.245
370	0.053	480	4.649	590	14.83	700	2.848
375	0.097	485	4.766	595	15.26	705	2.423
380	0.126	490	5.039	600	15.60	710	2.075
385	0.099	495	5.523	605	15.69	715	1.803
390	0.038	500	5.967	610	15.62	720	1.528
395	0.007	505	6.394	615	15.49	725	1.350
400	0.083	510	6.799	620	15.10	730	1.135
405	0.046	515	7.082	625	14.36	735	1.021
410	0.059	520	7.351	630	13.72	740	0.800
415	0.109	525	7.672	635	12.89	745	0.736
420	0.304	530	7.960	640	11.86	750	0.673
425	0.662	535	8.314	645	10.94	755	0.511
430	1.167	540	8.767	650	9.907	760	0.534
435	1.899	545	9.258	655	8.961	765	0.436
440	3.008	550	9.700	660	8.030	770	0.365
445	4.601	555	10.303	665	7.263	775	0.335
450	6.716	560	10.962	670	6.446	780	0.307
455	8.116	565	11.525	675	5.639		

Spectral Data Over Visible Wavelengths



PRODUCT PICTURE:

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:

Ryan Siddon

Ryan Siddon
Engineer
Lighting Division

Attachments: IES File - CRT1508181209-001B