



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

REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100555427

Date: January 20, 2012

REPORT NO. 100555427CRT-005

TEST OF ONE LED BULB

FIXTURE MODEL NO. LED-8024-DL

RENDERED TO

LIGHT EFFICIENT DESIGN
108 SOUTH WYSTONE PARK DRIVE SUITE 103
NORTH BARRINGTON, IL 60010

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

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

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 500336984.

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 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one sample of model number LED-8024-DL. The sample was received by Intertek on November 16, 2011, in undamaged condition, and one sample was tested as received. The sample designation was L238412-2.

DATES OF TESTS: December 9, 2011 through December 13, 2011.

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SUMMARY

Model No.:	LED-8024-DL
Description:	LED Bulb

Criteria	Result
Total Lumen Output	3777 Lumens
Total Power	44.20 W
Luminaire Efficacy	85.45
Power Factor	0.991
Current ATHD	5.34%
Correlated Color Temperature (CCT)	5669 K
Color Rendering Index (CRI) - Ra	83.9
Color Rendering Index (CRI) - R9	15.8
Duv	0.007
Chromaticity Coordinate (x)	0.328
Chromaticity Coordinate (y)	0.352
Chromaticity Coordinate (u')	0.200
Chromaticity Coordinate (v')	0.482

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/17/11	02/17/12
Data Precision Digital Voltmeter	3600	V124	02/17/11	02/17/12
Fluke Multimeter	45	M133	02/17/11	02/17/12
Fluke Temperature Meter	53 II	T1318	02/25/11	02/25/12
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	--	---	---
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hours of use
Xitron Power Analyzer	2503AH	E246	04/20/11	04/20/12
ITS 2 Meter Sphere	W/ CDS 600	N308	w/use	w/use
Fluke Temp Meter	53 II	N1324	03/11/11	03/11/12
Elgar AC Power Supply	CW1251	--	--	--
Yokogawa Power Meter	WT210	E464	04/19/11	04/19/12
LSI High Speed Mirror Goniometer	6440	--	w/use	w/use
Cole Parmer Hygro Thermometer	445703	T1359	10/26/11	10/26/12



TEST METHODS

Seasoning in Sample Orientation – LED Products

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

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.

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.

Estimated Total Operating Time

Model No.	Total Hours
LED-8024-DL	3

RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

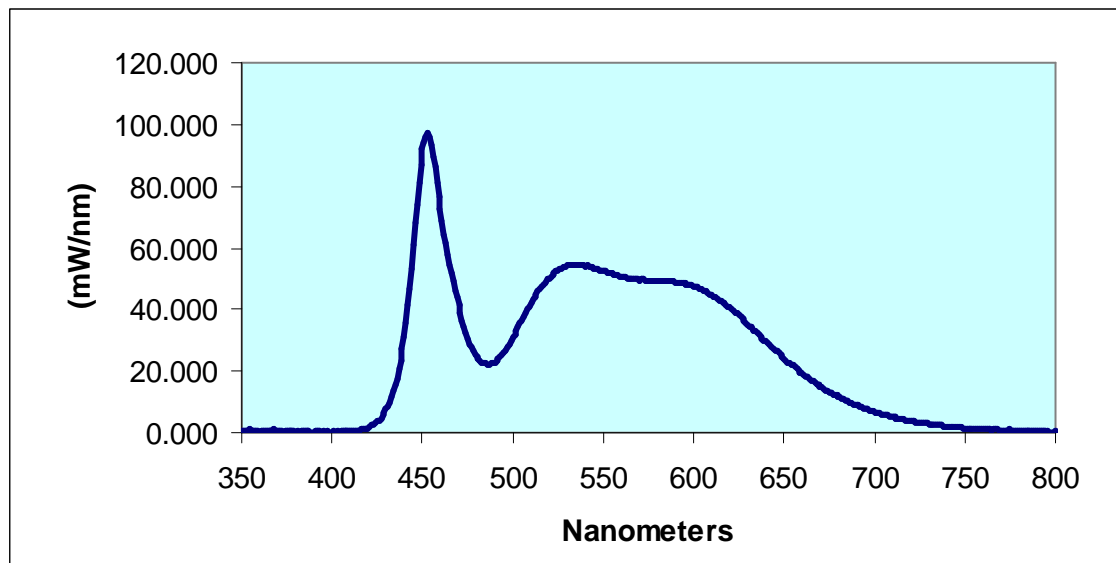
nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
LED-8024-DL							
350	0.645	460	72.815	570	49.592	680	11.555
355	0.444	465	54.711	575	49.360	685	10.126
360	0.229	470	41.421	580	49.470	690	8.857
365	0.703	475	30.646	585	49.312	695	7.731
370	0.430	480	24.508	590	48.833	700	6.751
375	0.714	485	22.428	595	48.404	705	5.795
380	0.284	490	23.017	600	47.541	710	5.020
385	0.533	495	25.985	605	46.257	715	4.359
390	0.238	500	30.987	610	44.630	720	3.845
395	0.486	505	36.622	615	42.887	725	3.415
400	0.122	510	42.159	620	40.708	730	2.848
405	0.336	515	46.794	625	38.100	735	2.425
410	0.476	520	50.061	630	35.346	740	2.106
415	0.748	525	52.744	635	32.294	745	1.750
420	1.614	530	54.302	640	29.533	750	1.552
425	3.615	535	54.634	645	26.698	755	1.476
430	7.535	540	54.120	650	23.988	760	1.346
435	15.428	545	53.479	655	21.753	765	0.000
440	31.136	550	52.502	660	19.319	770	0.972
445	60.784	555	51.575	665	17.090	775	1.065
450	91.798	560	50.757	670	15.010	780	0.656
455	93.086	565	50.124	675	13.217		

LIGHT EMITTING DESIGN

Sample No. L238412-2

Model No. LED-8024-DL

Spectral Data Over Visible Wavelengths



RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	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')
LED-8024-DL								
L238412-2	5669	83.9	15.8	0.007	0.328	0.352	0.200	0.482

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)
LED-8024-DL						
L238412-2	UP	120.0	368.6	44.04	0.996	5.34

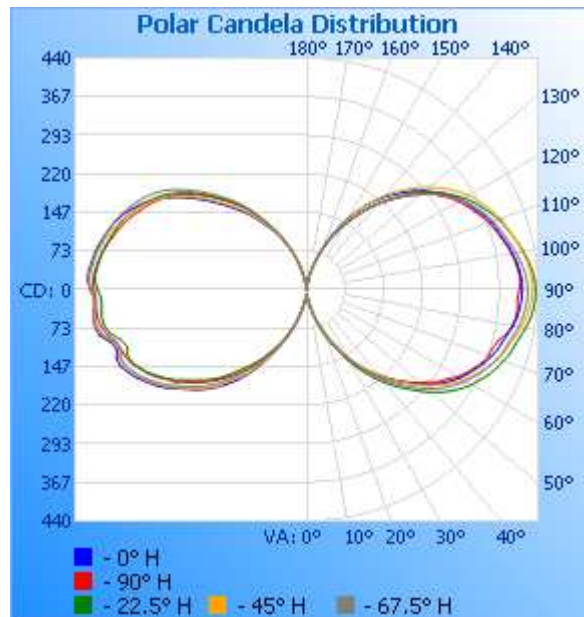
Photometric and Electrical Measurements – Distribution Method

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)
LED-8024-DL							
L238412-2	UP	120.0	371.5	44.20	0.991	3777	85.45

RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
LED-8024-DL					
0	8	8	8	8	8
5	14	14	14	13	12
10	27	26	28	25	24
15	50	49	50	44	48
20	80	79	78	72	76
25	113	112	108	103	108
30	147	153	142	142	141
35	183	193	177	183	176
40	216	230	211	221	211
45	247	266	246	257	244
50	280	303	282	293	276
55	311	336	315	324	306
60	336	362	344	349	331
65	356	382	366	368	352
70	373	398	387	385	368
75	385	410	400	396	377
80	398	422	414	409	397
85	407	432	424	417	402
90	410	435	429	420	405
95	407	430	426	415	404
100	398	418	416	404	396
105	385	404	404	391	383
110	374	390	393	379	370
115	357	369	376	361	352
120	341	347	358	341	335
125	319	320	332	315	311
130	292	288	303	284	282
135	263	253	270	249	248
140	231	216	235	215	214
145	196	178	195	177	178
150	156	142	153	143	143
155	116	106	113	109	109
160	79	74	77	77	76
165	45	46	44	47	49
170	19	22	17	22	18
175	1	1	1	2	1
180	1	1	1	1	1

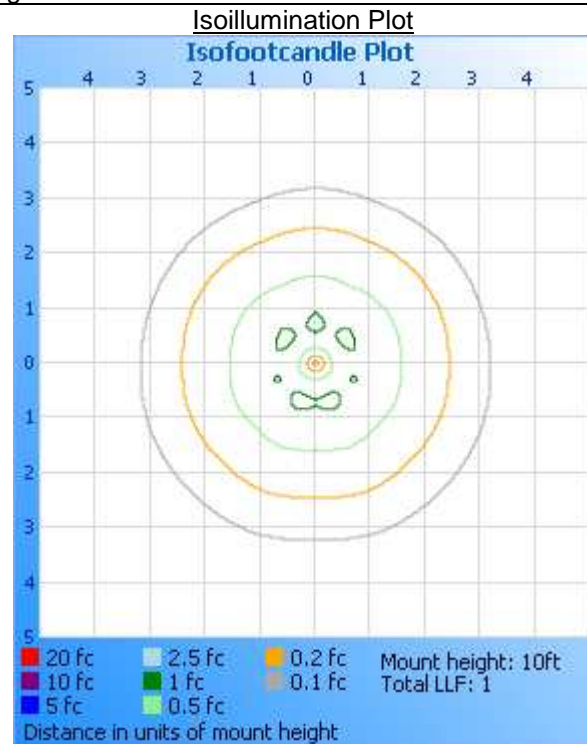
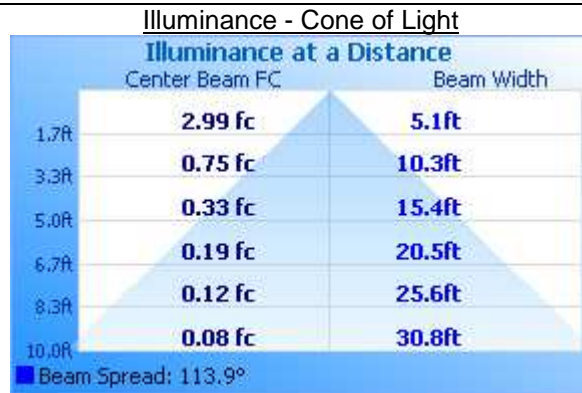


RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: LED-8024-DL

Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
LED-8024-DL		
0-30	69.3	1.8
0-40	185.0	4.9
0-60	665.6	17.6
60-90	1222	32.3
0-90	1887	50.0
90-180	1889	50.0
0-180	3777	100.0

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:

Kenda Branch
Engineer
Lighting Division

Attachment: None

Report Reviewed By:

Joseph Schledorn
Engineer
Lighting Division