



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

REPORT

3933 US ROUTE 11, CORTLAND, NEW YORK 13045

Project No. G101468480

Date: January 23, 2013

REPORT NO. 101468480CRT-005

TEST OF ONE LED RECESSED LUMINAIRE

MODEL NO. LSL35-UM6060FT(NDWCA)
LED MODEL NO. SEOUL SEMICONDUCTOR / STW8Q14C
DRIVER MODEL NO. DPU4035ZD-U

RENDERED TO

DONGBU LIGHTEC CO., LTD.
739-8 OJEONG-DONG OJEONG-GU
BUCHEON-SI 421-170 REPUBLIC OF KOREA

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 500498498.

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 LSL35-UM6060FT(NDWCA). The sample was received by Intertek on January 8, 2014, in undamaged condition and one sample was tested as received. The sample designation was CRT1401081407-005.

DATES OF TESTS: January 18, 2014 through January 21, 2014.

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SUMMARY

Model No.:	LSL35-UM6060FT(NDWCA)
Description:	LED RECESSED LUMINAIRE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3248	3232
Total Power (W)	34.39	34.53
Luminaire Efficacy (LPW)	94.45	93.6

Criteria	Result
Power Factor at 120Vac	0.993
Power Factor at 277Vac	0.916
Current ATHD % at 120Vac	7.03
Current ATHD % at 277Vac	13.81
Correlated Color Temperature (CCT - K)	3955
Color Rendering Index (CRI - Ra)	82.7
Color Rendering Index (CRI - R9)	11.4
DUV	0.002
Chromaticity Coordinate (x)	0.384
Chromaticity Coordinate (y)	0.384
Chromaticity Coordinate (u')	0.225
Chromaticity Coordinate (v')	0.505

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Sorenson DC Power Supply	XFR 150-8	---	VBU	VBU
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hrs of use
LABSPHERE 3M	W/ CDS 1100	N307	VBU	VBU
Fluke Temperature Meter	53 II	T1318	03/15/13	03/15/14
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT1600	E474	03/15/13	03/15/14
Extech Hygro-Thermometer	445703	T1366	11/27/13	11/27/14
LSI High Speed Mirror Goniometer	6440	---	12/23/13	01/23/14
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

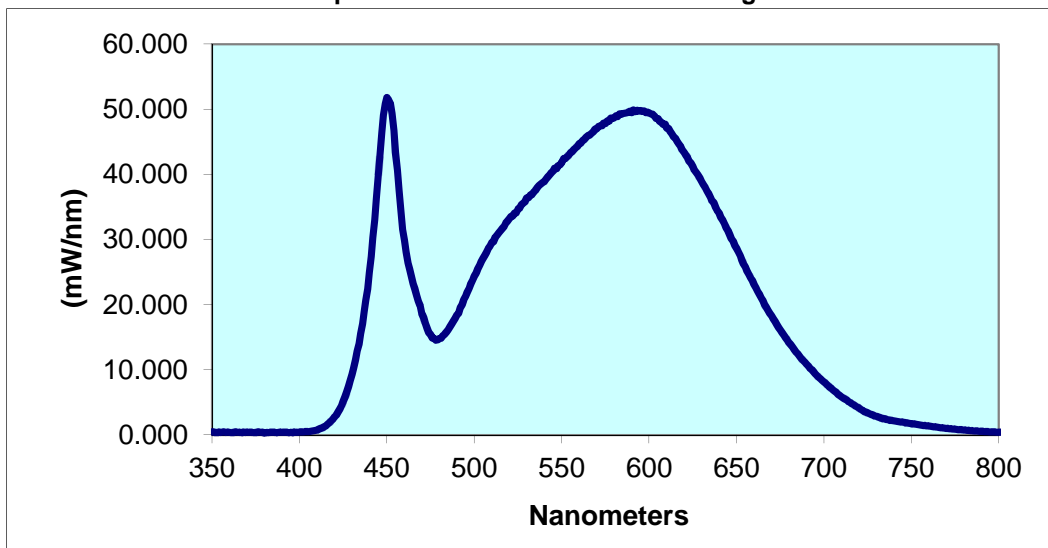
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
CRT1401081407-005	UP	120.0	288.7	34.39	0.993	7.03	3248	94.45
		277.0	135.8	34.44	0.916	13.81		

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')
3955	82.7	11.4	0.002	0.384	0.384	0.225	0.505

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.433	440	24.910	530	36.350	620	43.340	710	5.854
355	0.393	445	39.850	535	37.530	625	41.190	715	4.963
360	0.383	450	51.790	540	38.910	630	38.950	720	4.113
365	0.412	455	43.400	545	40.490	635	36.450	725	3.378
370	0.452	460	29.860	550	41.850	640	34.040	730	2.841
375	0.371	465	23.190	555	43.360	645	31.390	735	2.440
380	0.314	470	18.630	560	44.730	650	28.610	740	2.157
385	0.406	475	15.320	565	45.940	655	25.770	745	1.959
390	0.379	480	14.800	570	47.050	660	23.110	750	1.740
395	0.383	485	16.140	575	47.810	665	20.590	755	1.551
400	0.430	490	18.420	580	48.720	670	18.290	760	1.368
405	0.478	495	21.300	585	49.370	675	16.130	765	1.176
410	0.764	500	24.400	590	49.490	680	14.140	770	1.012
415	1.404	505	27.100	595	49.800	685	12.460	775	0.881
420	2.737	510	29.540	600	49.420	690	10.870	780	0.755
425	5.094	515	31.360	605	48.570	695	9.417		
430	9.287	520	33.200	610	47.140	700	8.133		
435	15.590	525	34.710	615	45.540	705	6.942		

Spectral Data Over Visible Wavelengths



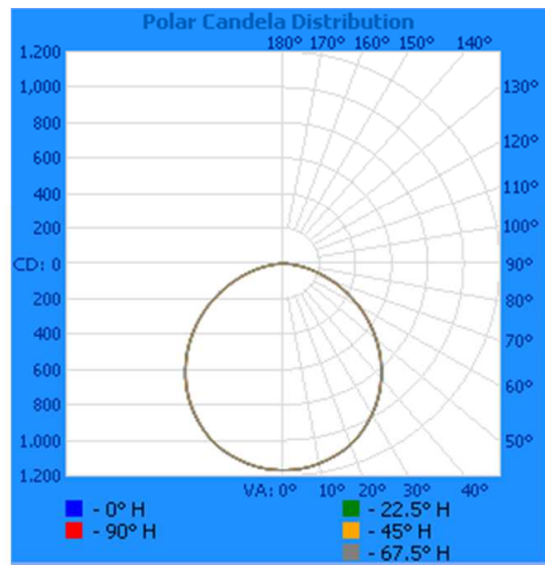
RESULTS OF TEST (cont'd)

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)
CRT1401081407-005	UP	120.0	298.3	34.53	0.994	3232	93.6

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1168	1168	1168	1168	1168
5	1164	1163	1162	1162	1163
10	1148	1146	1146	1146	1147
15	1123	1122	1121	1121	1122
20	1090	1089	1088	1088	1088
25	1042	1042	1040	1039	1039
30	985	984	983	981	981
35	920	920	918	916	916
40	846	845	844	841	842
45	764	763	762	760	760
50	676	674	674	670	673
55	583	580	581	576	581
60	486	483	485	481	485
65	388	386	385	386	386
70	292	292	287	292	289
75	201	202	196	201	198
80	116	118	115	117	117
85	45	44	43	41	43
90	0	0	0	0	0

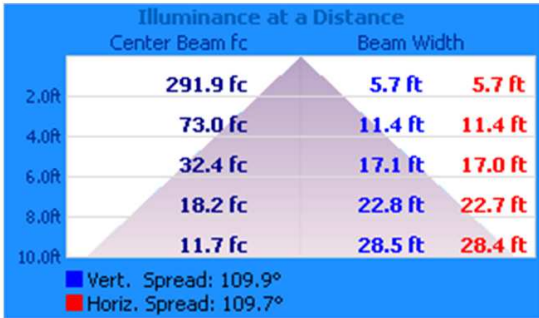


RESULTS OF TEST (cont'd)

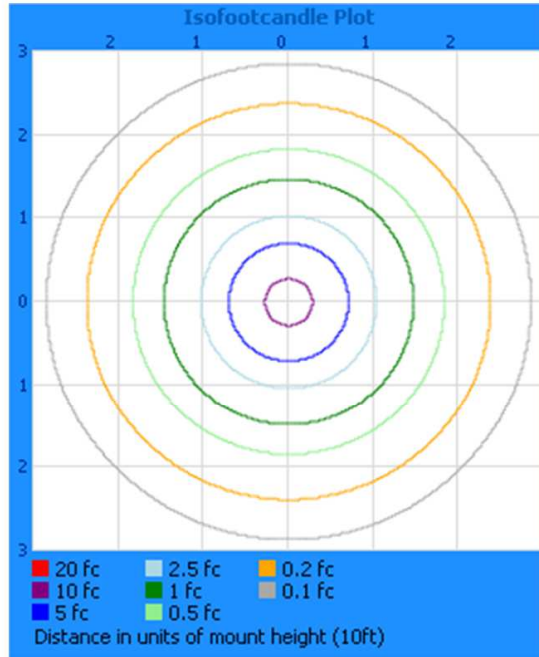
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	906.2	28.0
0-40	1480	45.8
0-60	2585	80.0
60-90	646.9	20.0
0-90	3232	100.0
90-180	0.0	0.0
0-180	3232	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	110.4	3.4
10-20	316.6	9.8
20-30	479.2	14.8
30-40	573.7	17.8
40-50	586.9	18.2
50-60	517.9	16.0
60-70	382.3	11.8
70-80	212.0	6.6
80-90	52.6	1.6

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:



Melanie Brittain
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Jeffrey Davis
Engineering Manager
Lighting Division