

LM-79-08 Test Report

Outdoor Non-Cutoff and Semi-Cutoff Wall-mounted Area Luminaires

Model name(s): WML-60W

Representative (Tested) Model: WML-60NW
WML-60CW

Model Different: All construction and rating are the same, except CCT

Test & Report By:

Johnson Sun

Engineer: Johnson Sun

Update: Nov.03, 2016

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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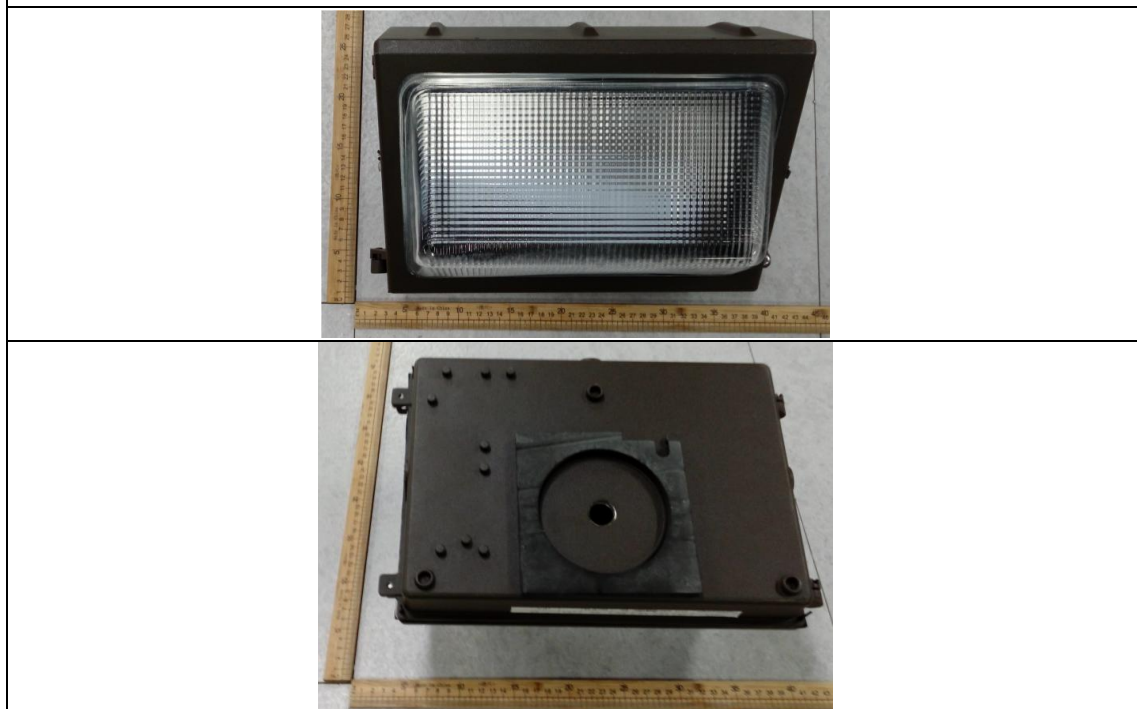
Fax: 8620-32290422

<http://www.standard-tech.com>

1.1 Product Information:

Organization Name	WESTGATE MFG.	
Brand Name		
Model Number		
SKU (if available)	N/A Type of Luminaire (for	
integral lamps, Outdoor Non-Cutoff and Semi	-Cutoff Wall-mounted Area	
list base type and lamp type)	Luminaires	
Rated Voltage / Frequency	100 -277Vac, 50/60 Hz	
Nominal Power	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K,5000K	
LED Manufacturer	Philips Lumileds	
LED Model	LUXEON 3030 2D	
Sample Number	GZE161105-T1(4000K),T2(5000K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	: Oct.31,2016
Date of Test	: Nov.01,2016
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

1.3 Test Methods

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ± 1 °C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 °vertical intervals and 22.5 °horizontal intervals.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3) Electrical Measurements:</p> <p>Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 °C ± 1 °C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.</p>

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-01	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WML-60NW		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161105-	120.0	60	0.5030	60.09	0.9955	11.62
T1	277.0	60	0.2355	60.55	0.9281	15.84
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

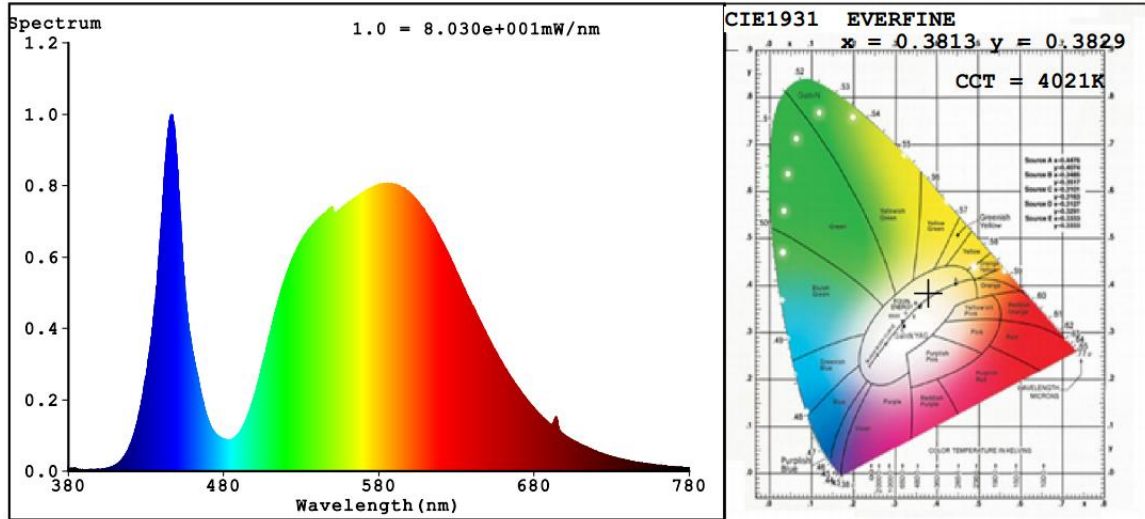
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	71	R9	0
Frequency (Hz)	60	R2	788	R10	46
CCT (K)	4021	R3	274	R11	71
Duv	0.0026	R4	70	R12	41
Chromaticity (x, y)	x=0.3813 y=0.3829	R5	68	R13	72
Chromaticity (u', v')	u'=0.2233 v'=0.5044	R6	82	R14	89
Color Rendering Index (CRI)	73.0	R7	58	R15	66
R9	0	R8	0	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7045.8	6990.3		
Luminous Efficacy (lm/W)	117.25	115.45		
Total Luminous (lm)(0-90 °)	5718.0	5671.0	>=300 (-10%)	
Luminous Efficacy (lm/W)(0-90 °)	95.16	93.66	Standard: >= 95(-3%)	Premium: >= 115(-3%)
Zonal lumens in the (80-90 °)/(0-90 °) zone (%)	12.06	--	<=10(3)	
Beam Angle (°)	101.4	--	--	
Center Beam Candle Power (cd)	1430	--	--	

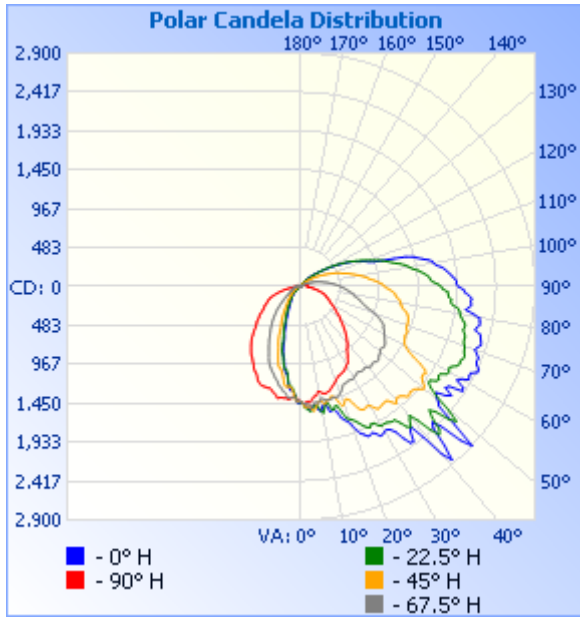
Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,030.7	14.6%
0-40	1,719.4	24.4%
0-60	3,391.3	48.1%
60-90	2,326.7	33%
70-100	2,038.1	28.9%
90-120	1,158.3	16.4%
0-90	5,718.0	81.1%
90-180	1,329.3	18.9%
0-180	7,047.3	100%

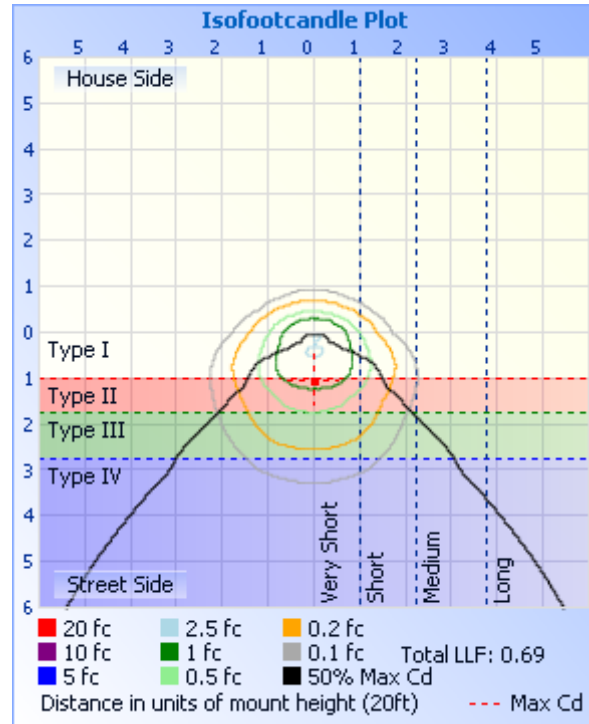
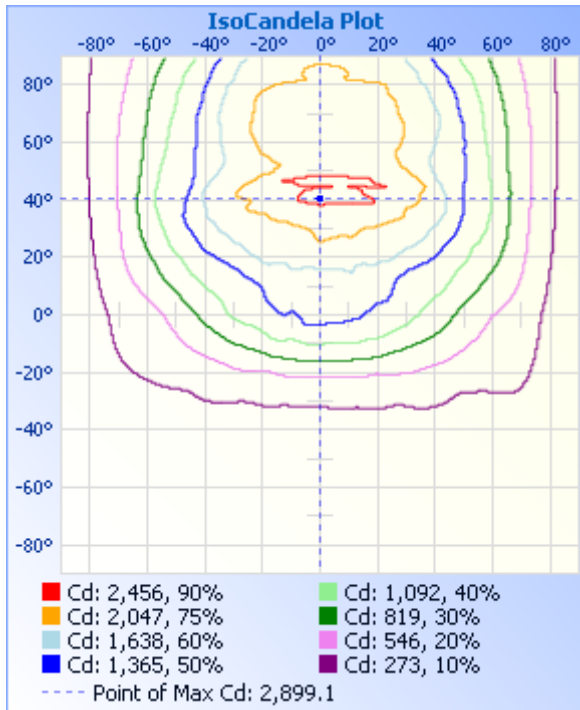
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	132.2	1.9%	90-100	553.5	7.9%
10-20	358.3	5.1%	100-110	384.9	5.5%
20-30	540.2	7.7%	110-120	219.9	3.1%
30-40	688.7	9.8%	120-130	107.5	1.5%
40-50	833.9	11.8%	130-140	43.4	0.6%
50-60	838.0	11.9%	140-150	15.0	0.2%
60-70	842.1	11.9%	150-160	3.9	0.1%
70-80	794.8	11.3%	160-170	0.8	0%
80-90	689.8	9.8%	170-180	0.3	0%



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	4.95 fc	47.6 ft	36.7 ft
34.0ft	1.24 fc	95.2 ft	73.3 ft
51.0ft	0.55 fc	142.8 ft	110.0 ft
68.0ft	0.31 fc	190.4 ft	146.7 ft
85.0ft	0.20 fc	238.1 ft	183.3 ft
102.0ft	0.14 fc	285.7 ft	220.0 ft

■ Vert. Spread: 108.9°
■ Horiz. Spread: 94.3°



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C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430	1430
5	1388	1433	1449	1502	1514	1542	1531	1498	1422	1447	1341	1310	1290	1258	1276	1387
10	1399	1518	1499	1502	1516	1594	1450	1411	1321	1228	1205	1084	1089	1048	1219	1312
15	1355	1461	1468	1527	1579	1581	1417	1439	1342	1190	995	871	867	872	1043	1191
20	1322	1392	1531	1778	1828	1751	1557	1410	1247	1057	811	617	602	628	825	1085
25	1277	1433	1682	1971	2033	1926	1662	1316	1187	883	597	438	419	458	631	949
30	1172	1323	1815	2072	2075	1994	1706	1307	1126	742	439	327	296	343	482	796
35	1063	1304	1898	2147	2371	2021	1772	1286	1000	614	333	244	226	255	356	666
40	964	1334	1969	2214	2713	2089	1840	1306	886	478	251	192	186	199	270	548
45	846	1339	2021	2364	2452	2295	1897	1319	764	378	196	154	147	162	209	437
50	724	1309	2103	2460	2217	2394	1980	1276	638	298	157	114	103	122	164	328
55	632	1270	2108	2173	2186	2040	1883	1267	533	231	120	83.1	74.8	90.2	130	239
60	537	1262	1652	2270	2299	2119	1502	1190	442	184	87.4	53.9	39.8	65.5	103	177
65	469	1194	1597	2350	2431	2178	1425	1130	374	150	64.6	34.5	28.1	45.7	82.2	139
70	408	1033	1601	2303	2293	2159	1399	972	324	123	50.5	24.4	20.2	30.3	65.6	117
75	302	868	1585	2166	2299	2080	1368	786	255	106	37.2	12.3	6.61	12.9	47.6	104
80	198	782	1464	2048	2248	2003	1256	675	177	94.7	20.5	4.29	4.55	4.23	27.3	95.0
85	116	669	1334	1947	2109	1872	1174	586	120	81.1	16.9	4.99	5.50	4.68	21.1	80.8
90	76.1	566	1172	1827	1956	1740	1042	493	89.2	66.2	14.2	5.24	6.00	4.93	16.8	67.0
95	60.3	442	1017	1680	1849	1573	906	399	76.0	54.0	11.2	5.24	6.05	4.92	13.2	55.4
100	55.3	326	874	1468	1670	1370	762	310	67.5	44.1	8.49	5.09	5.95	4.78	10.1	45.4
105	52.3	229	723	1243	1438	1164	624	230	56.0	36.3	6.82	4.84	6.00	4.68	8.42	37.1
110	50.1	165	573	1030	900	964	497	167	49.3	28.9	5.68	4.54	5.50	4.43	7.18	28.3
115	46.0	119	425	813	745	760	377	119	44.8	21.5	5.14	4.44	5.40	4.43	6.19	21.0
120	37.8	84.4	306	617	558	577	276	79.7	37.9	15.9	4.59	4.34	5.20	4.23	5.35	16.0
125	27.9	58.1	221	439	396	411	199	50.9	28.2	11.5	3.85	3.84	4.70	4.03	4.56	12.1
130	20.5	37.4	157	289	278	271	142	31.1	19.7	8.23	3.66	3.74	4.45	4.03	3.96	9.34
135	15.2	25.0	107	187	193	174	97.8	20.6	13.9	6.40	3.56	3.79	4.25	4.08	3.67	7.36
140	11.2	15.3	70.6	121	131	111	63.7	12.6	9.50	4.92	3.41	3.84	4.40	4.23	3.57	5.53
145	7.85	9.33	42.9	72.1	84.6	68.8	37.8	7.28	6.55	3.84	3.16	3.84	4.40	4.38	3.57	4.30
150	5.77	6.07	22.7	39.5	50.1	39.9	19.8	5.20	4.48	3.50	3.01	3.54	4.05	3.83	3.52	3.31
155	4.09	4.34	8.76	20.9	28.4	22.1	7.50	3.62	3.05	2.71	2.87	2.94	3.44	3.43	3.12	2.87
160	3.11	2.91	2.28	6.90	10.1	7.22	2.09	2.57	2.46	2.46	2.87	2.94	2.95	2.98	3.07	2.87
165	2.91	2.37	2.08	2.15	2.21	1.94	2.03	2.32	2.57	2.57	2.91	2.94	3.00	2.94	3.12	3.01
170	3.34	2.90	2.61	2.20	2.00	2.24	2.52	2.82	3.55	3.65	3.90	3.74	3.65	3.53	3.62	3.66
175	3.50	3.49	3.11	2.89	2.60	2.79	3.12	3.46	3.55	3.55	3.85	3.74	3.55	3.33	3.52	3.61
180	3.55	3.65	3.46	3.09	2.85	3.08	3.37	3.56	3.55	3.55	3.66	3.49	3.00	2.83	2.97	3.36

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BUG Rating: B1-U4-G4

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	663.43	9.4
FM - Front-Medium(30-60)	2013.3	28.6
FH - Front-High(60-80)	1540.2	21.9
FVH - Front-Very High(80-90)	666.25	9.5
Total Forward Light	6169.3	87.6

BL - Back-Low(0-30)	367.34	5.2
BM - Back-Medium(30-60)	347.44	4.9
BH - Back-High(60-80)	96.143	1.4
BVH - Back-Very High(80-90)	23.181	0.3
Total Back Light	876.53	12.4

UL - Uplight-Low(90-100)	553.15	7.9
UH - Uplight-High(100-180)	775.36	11.0
Total Up Light	1328.5	18.9

BUG(Back,Up,Glare) Rating	B1-U4-G4
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Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	834.1	42.43	876.53
Street Side	4883.2	1286.1	6169.3

2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2016-11-01	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	WML-60CW		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE161105-	120.0	60	0.5070	60.52	0.9947	11.57
T2	277.0	60	0.2374	60.98	0.9274	15.79
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

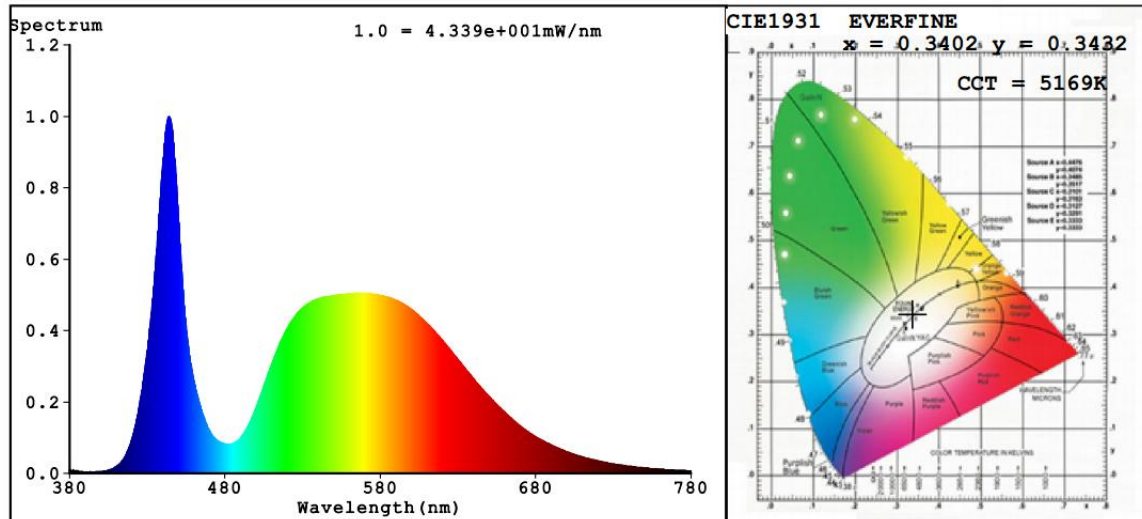
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	75	R9	0
Frequency (Hz)	60	R2	76	R10	43
CCT (K)	5169	R3	76	R11	76
Duv	-0.0023	R4	76	R12	48
Chromaticity (x, y)	x=0.3402 y=0.3432	R5	75	R13	73
Chromaticity (u', v')	u'=0.2114 v'=0.4798	R6	68	R14	86
Color Rendering Index (CRI)	73.6	R7	79	R15	70
R9	0	R8	64	--	--

Photometric Measurement – Sphere-Spectroradiometer Method :

Parameter	Result		DLC V4.0 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7231	7174		
Luminous Efficacy (lm/W)	119.48	117.65		
Total Luminous (lm)(0-90 °)	5868	5820	>=300 (-10%)	
Luminous Efficacy(lm/W)(0-90 °)	96.96	95.44	Standard: >= 95(-3%)	Premium: >= 115(-3%)

Spectral Power Distribution & Chromaticity Diagram



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3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

******* END OF REPORT *******

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