

LM-79-08 Test Report

For

Revolution Lighting Technologies, Inc

(Brand Name: Revolution Lighting Technologies)

2280 Ward Ave. Simi Valley CA.93065

Linear Retrofit Kits for 2x4 Luminaires

Model name(s): 15G315-11C

Remark: "C" denotes to CCT, may be
1,2,3,5. (1=3000K, 2=3500K, 3=4000K, 5=5000K).Representative (Tested) Model: 15G315-111
15G315-113
15G315-115

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

Test & Report By:

Biao Zhong

Engineer: Biao Zhong

Date: Apr.20,2018

Review By:

Univ Xie

Manager: Univ Xie

Remark: This is multiple listed report, the Project Number of the original report is GZE1803070-N

Note: 1. The results contained in this report pertain only to the tested samples.

2. 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

Address: Standard-Tech Building, No.6 Guanhong Road, Guangzhou Science City, Guangzhou 510663, China

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

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc	
Brand Name	Revolution Lighting Technologies	
Model Number	15G315-11C	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Linear Retrofit Kits for 2x4 Luminaires	
Rated Voltage / Frequency	100 ~ 277 Vac, 50/60 Hz	
Nominal Power	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K, 3500K, 4000K, 5000K	
LED Manufacturer	XUYU OPTOELECTRONIC (SHEN ZHEN) CO., LTD	
LED Model	XY-2835W3TJ-1C2B XY-2835W2JJ-1C2B XY-2835W1JJ-1C2B	
Sample Number	GZE1803070-N1(3000K), N2(4000K), N3(5000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

Photo



1.2 Test Specifications:

Date of Receipt	Apr.05,2018
Date of Test	Apr.07,2018
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

1) Photometric and Light Distribution Measurement – Goniophotometer Method:

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.

2) Chromaticity Measurement – Sphere-Spectroradiometer Method:

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.

3) Electrical Measurements:

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.

2.1 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-04-07	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	15G315-111		

Electrical Measurement in Lithonia 2GT8 lensed 2x4:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.3602	42.51	0.9834	12.04
0-N1	277.0	60	0.1669	42.38	0.9165	12.56
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

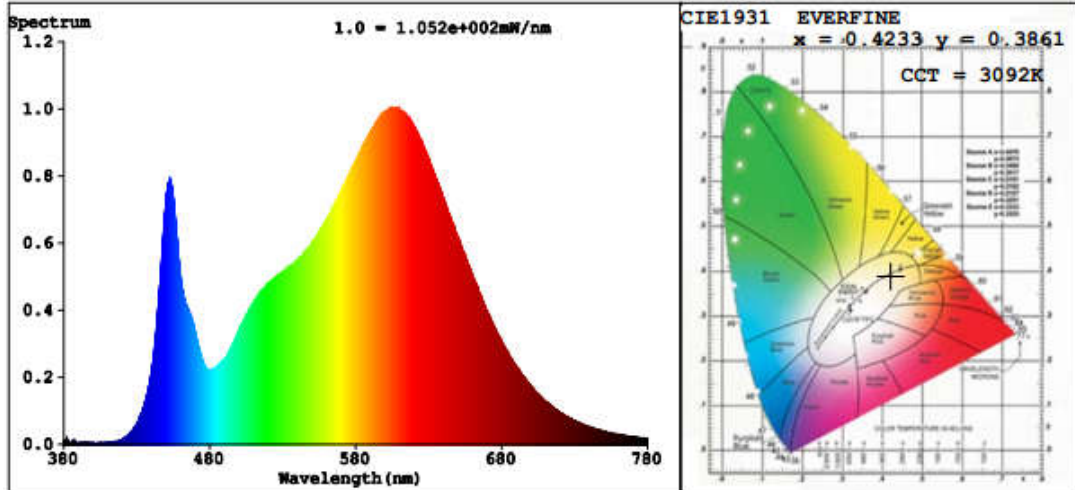
Chromaticity Measurement in Lithonia 2GT8 lensed 2x4- Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	87	R9	24
Frequency (Hz)	60	R2	95	R10	89
CCT (K)	3092	R3	95	R11	85
Duv	-0.0054	R4	84	R12	76
Chromaticity (x, y)	x=0.4233 y=0.3861	R5	87	R13	89
Chromaticity (u', v')	u'=0.2495 v'=0.5120	R6	93	R14	98
Color Rendering Index (CRI)	86.1	R7	83	R15	81
R9	24	R8	65	--	--

Photometric Measurement in Lithonia 2GT8 lensed 2x4- Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	5424.5	5388.9	>=3000(-10%)	
Luminous Efficacy (lm/W)	127.61	127.16	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	126.77		100(-3%)	125(-3%)
Zonal lumens in the 0-60° zone (%)	85	--	>= 75(-3)	
SC: 0-180° (if applicable)	1.31	--	1.0-2.0(±0.1)	
SC: 90-270° (if applicable)	1.21	--	1.0-2.0(±0.1)	
Beam Angle (°)	99.3	--	--	
Center Beam Candle Power (cd)	2224	--	--	

Spectral Power Distribution & Chromaticity Diagram



Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,735.9	32%
0-40	2,820.8	52%
0-60	4,611.9	85%
60-90	801.6	14.8%
70-100	348.4	6.4%
90-120	5.0	0.1%
0-90	5,413.5	99.8%
90-180	10.2	0.2%
0-180	5,423.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	210.6	3.9%	90-100	2.1	0%
10-20	605.4	11.2%	100-110	1.5	0%
20-30	919.9	17.0%	110-120	1.5	0%
30-40	1,084.9	20.0%	120-130	1.4	0%
40-50	1,026.2	18.9%	130-140	1.2	0%
50-60	764.9	14.1%	140-150	1.0	0%
60-70	455.3	8.4%	150-160	0.8	0%
70-80	259.2	4.8%	160-170	0.5	0%
80-90	87.1	1.6%	170-180	0.2	0%

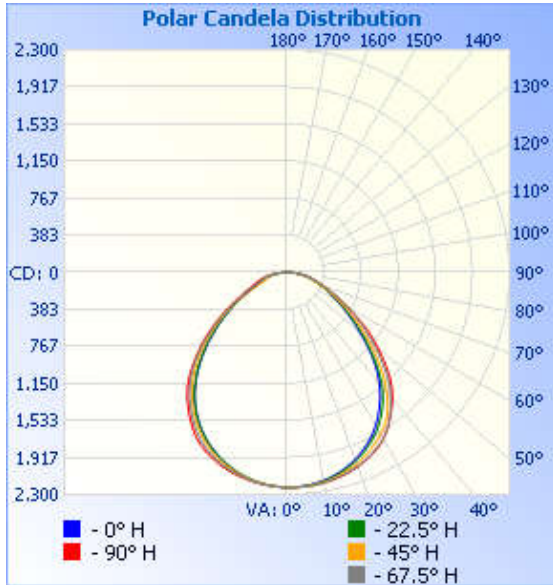
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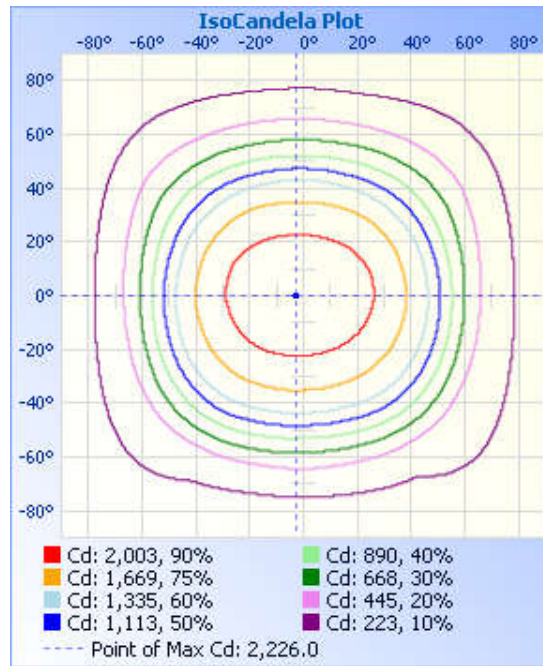
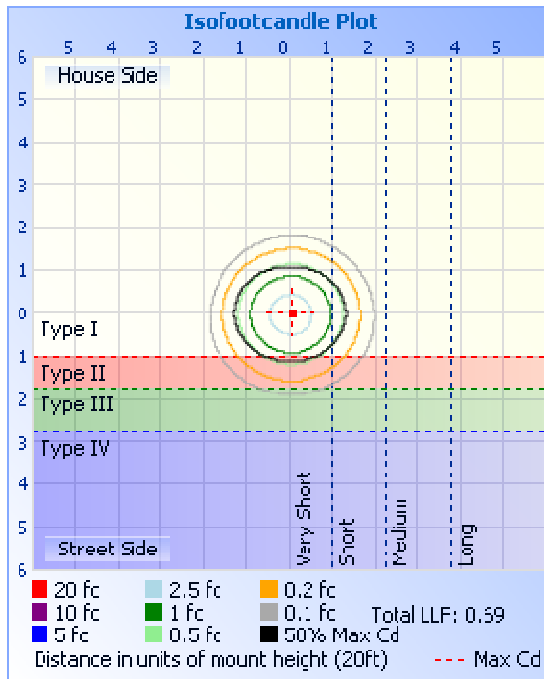
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
12.0ft	15.45 fc	26.5 ft	30.2 ft
24.0ft	3.86 fc	53.1 ft	60.3 ft
36.0ft	1.72 fc	79.6 ft	90.5 ft
48.0ft	0.97 fc	106.2 ft	120.6 ft
60.0ft	0.62 fc	132.7 ft	150.8 ft

■ Vert. Spread: 95.8°
■ Horiz. Spread: 103.0°



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Table--1 UNIT: cd

C (DEG) y (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338
0	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224	2224
5	2212	2214	2214	2214	2216	2219	2222	2224	2224	2220	2218	2213	2210	2208	2209	2210
10	2187	2190	2187	2183	2186	2193	2202	2209	2210	2201	2193	2181	2174	2172	2176	2183
15	2149	2150	2141	2130	2134	2145	2163	2179	2181	2167	2151	2129	2116	2114	2125	2139
20	2095	2093	2076	2057	2059	2076	2106	2134	2139	2117	2089	2057	2036	2036	2054	2079
25	2021	2017	1992	1962	1961	1985	2031	2071	2078	2047	2009	1962	1935	1936	1962	1996
30	1915	1916	1884	1842	1833	1869	1934	1987	1991	1947	1899	1842	1810	1811	1842	1880
35	1766	1761	1737	1685	1671	1715	1804	1852	1852	1805	1758	1694	1657	1658	1692	1732
40	1601	1567	1527	1488	1482	1529	1598	1664	1694	1646	1592	1509	1466	1469	1520	1565
45	1383	1338	1280	1238	1256	1283	1354	1441	1488	1457	1392	1297	1243	1254	1314	1362
50	1139	1089	1040	1000	1001	1033	1102	1180	1236	1214	1153	1061	1008	1016	1071	1117
55	884	856	818	789	791	811	871	940	980	947	897	829	781	785	826	860
60	647	660	623	609	615	625	664	728	725	697	649	604	581	568	581	608
65	459	492	459	460	475	477	487	546	519	460	409	399	410	380	365	403
70	351	349	331	337	358	352	351	390	379	329	269	276	295	272	251	308
75	273	249	243	247	266	259	253	266	282	257	217	213	218	212	209	252
80	187	173	164	167	184	175	172	173	190	180	163	153	153	147	161	182
85	78.2	85.5	76.5	84.3	90.7	91.7	79.4	89.6	84.2	86.1	75.7	72.8	75.3	71.9	71.1	79.8
90	1.87	1.87	2.01	2.16	2.22	2.28	2.09	2.01	1.10	1.17	1.31	1.77	14.8	14.2	1.09	1.24
95	1.17	1.10	1.17	1.37	1.50	1.40	1.24	1.17	0.91	0.97	1.08	1.40	3.83	6.21	1.10	1.11
100	1.03	0.93	1.29	1.42	1.52	1.29	1.18	0.89	0.90	0.83	1.31	1.28	1.98	2.31	1.30	1.24
105	1.24	1.10	1.36	1.48	1.57	1.25	1.23	1.07	1.20	1.03	1.58	1.28	2.38	1.35	1.39	1.44
110	1.34	1.35	1.60	1.77	1.62	1.17	1.31	1.24	1.40	1.31	1.83	1.21	1.43	1.26	1.48	1.83
115	1.59	1.79	2.13	1.64	1.50	1.08	1.30	1.41	1.48	1.65	1.95	1.10	1.35	1.06	1.43	1.93
120	1.86	2.06	2.17	1.11	1.16	1.05	1.47	1.85	1.61	1.70	1.85	1.10	1.28	0.94	1.43	2.05
125	2.35	2.13	2.11	1.14	1.26	1.06	1.44	1.87	1.74	1.77	1.51	1.15	1.22	1.02	1.28	1.83
130	2.40	2.11	1.93	1.10	1.29	1.08	1.41	1.95	1.88	1.79	1.51	1.16	1.29	1.16	1.31	1.65
135	2.37	2.09	1.69	1.13	1.29	1.11	1.38	2.13	1.97	1.86	1.51	1.41	1.57	1.29	1.34	1.65
140	2.34	2.06	1.45	1.17	1.29	1.16	1.33	2.02	1.98	1.86	1.51	1.63	1.73	1.53	1.37	1.65
145	2.10	1.86	1.32	1.21	1.38	1.21	1.20	1.87	1.99	1.86	1.51	1.76	1.91	1.71	1.44	1.65
150	2.13	1.78	1.35	1.27	1.50	1.25	1.25	1.76	1.99	1.86	1.60	1.94	2.04	1.95	1.71	1.65
155	1.86	1.71	1.38	1.40	1.64	1.29	1.29	1.72	2.00	1.86	1.63	2.05	2.31	2.18	1.87	1.65
160	1.86	1.65	1.42	1.50	1.77	1.70	1.34	1.67	2.07	1.86	1.66	2.12	2.33	2.18	2.12	1.72
165	1.79	1.58	1.52	1.97	2.13	1.93	1.42	1.58	2.12	1.86	1.72	2.13	2.35	2.18	2.22	1.87
170	1.79	1.58	1.67	2.12	2.22	2.09	1.71	1.58	2.20	1.89	1.93	2.06	2.37	2.18	2.32	1.96
175	1.79	1.78	1.84	2.32	2.19	2.15	1.85	1.58	2.26	1.93	1.88	1.91	2.29	2.18	2.16	1.79
180	1.79	1.86	1.93	2.25	2.18	2.18	1.85	1.79	2.14	1.79	1.86	1.91	2.24	2.18	2.26	1.86

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2.2 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-04-07	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	15G315-113		

Electrical Measurement in Lithonia 2GT8 lensed 2x4:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.3607	42.56	0.9833	12.06
0-N2	277.0	60	0.1671	42.41	0.9164	12.58
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

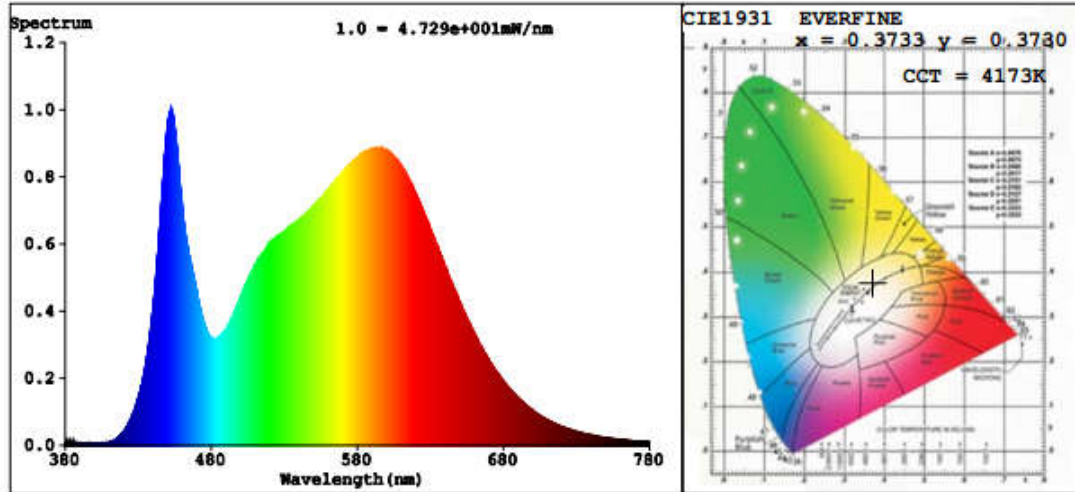
**Chromaticity Measurement in Lithonia 2GT8 lensed 2x4-
 Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	7
Frequency (Hz)	60	R2	91	R10	77
CCT (K)	4173	R3	96	R11	80
Duv	0.0004	R4	81	R12	63
Chromaticity (x, y)	x=0.3733 y=0.3730	R5	82	R13	84
Chromaticity (u', v')	u'=0.2219 v'=0.4988	R6	86	R14	98
Color Rendering Index (CRI)	83.4	R7	86	R15	76
R9	7	R8	64	--	--

**Photometric Measurement in Lithonia 2GT8 lensed
 2x4–Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.3Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	5485	5448	>=3000(-10%)	
Luminous Efficacy (lm/W)	128.88	128.46	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	128.01		100(-3%)	125(-3%)

Spectral Power Distribution & Chromaticity Diagram



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2.3 Electrical, Photometric and Chromaticity Measurements

(Refer to Work Instruction QD25)

Test date	2018-04-07	Test Ambient:	25.2 ° C
Test Orientation	Horizontal	Stabilization Time (min)	90
Model Number	15G315-115		

Electrical Measurement in Lithonia 2GT8 lensed 2x4:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.3610	42.59	0.9831	12.08
0-N3	277.0	60	0.1673	42.44	0.9160	12.61
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

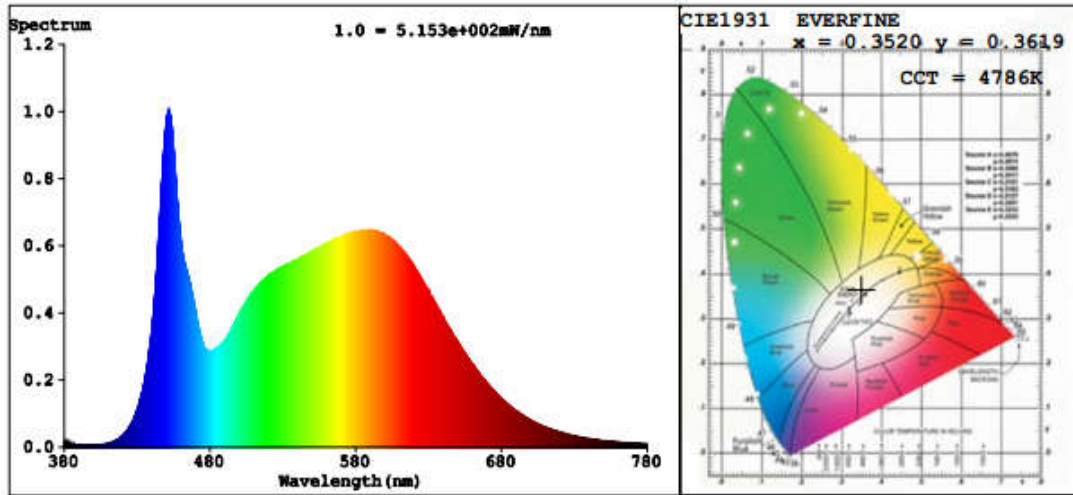
**Chromaticity Measurement in Lithonia 2GT8 lensed 2x4-
 Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	12
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	4786	R3	95	R11	81
Duv	0.0024	R4	82	R12	59
Chromaticity (x, y)	x=0.3520 y=0.3619	R5	82	R13	85
Chromaticity (u', v')	u'=0.2121 v'=0.4906	R6	86	R14	98
Color Rendering Index (CRI)	84.2	R7	88	R15	77
R9	12	R8	68	--	--

**Photometric Measurement in Lithonia 2GT8 lensed
 2x4–Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.3Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	5553	5516	>=3000(-10%)	
Luminous Efficacy (lm/W)	130.38	129.97	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	129.51		100(-3%)	125(-3%)

Spectral Power Distribution & Chromaticity Diagram



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2.4 Performance Assessment:

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
15G315-111	3000K	5424.5	42.51	127.61
15G315-112	3500K	5455 ^{*1}	42.54 ^{*2}	128.23 ^{*3}
15G315-113	4000K	5485	42.56	128.88
15G315-115	5000K	5553	42.59	130.38

*1: This value is calculated and the calculation formula is as below:

$$5455 = (5485 - 5424.5) / 2 + 5424.5$$

*2: This value is calculated and the calculation formula is as below:

$$42.54 = 5455 / 128.23$$

*3: This value is calculated and the calculation formula is as below:

$$128.23 = 5455 / 42.54$$

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06

Expand Uncertainty:
Photometric Measurement (Sphere):2.04%, k=2
Chromaticity Measurement(Sphere):28.8K, k=2
Photometric Measurement(Goniophotometer):2.36%, k=2

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

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