

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 2x2 Luminaires

Model name(s): 15G312-11C

Remark: "C" denotes to CCT, may be
1,2,3,5. (1=3000K, 2=3500K, 3=4000K, 5=5000K).Representative (Tested) Model: 15G312-111
15G312-113
15G312-115

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-K

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

Tel: 8620-3229 0320

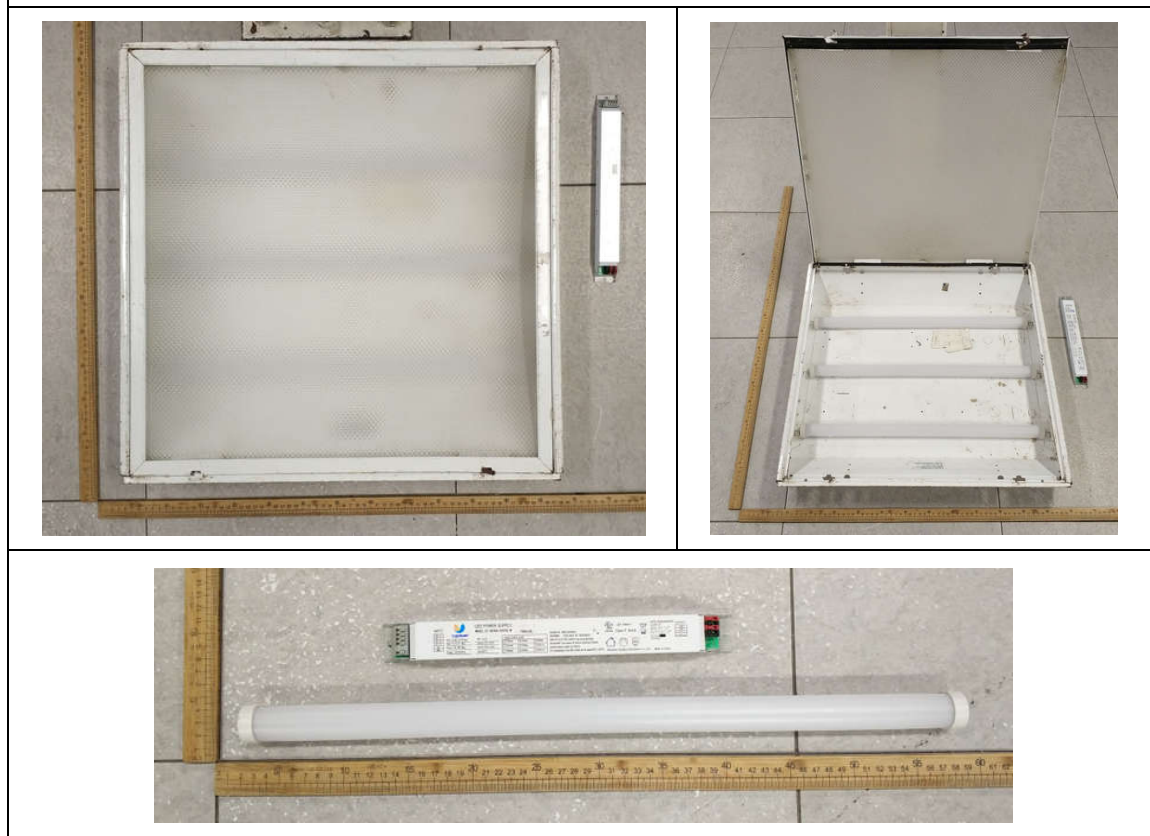
Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	Revolution Lighting Technologies, Inc	
Brand Name	Revolution Lighting Technologies	
Model Number	15G312-11C	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Linear Retrofit Kits for 2x2 Luminaires	
Rated Voltage / Frequency	100 ~ 277 Vac, 50/60 Hz	
Nominal Power	30W	
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-K1(3000K), K2(4000K), K3(5000K)	
Lamp Length	--	mm
Lamp Width	--	mm
Number of Units (modular products)	N/A	s

Photo



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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

<p>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.</p>
<p>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.</p>
<p>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.</p>

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	15G312-111		

Electrical Measurement in Lithonia 2GT8 lensed 2x2:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.2535	29.89	0.9826	13.02
0-K1	277.0	60	0.1148	29.63	0.9321	12.83
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

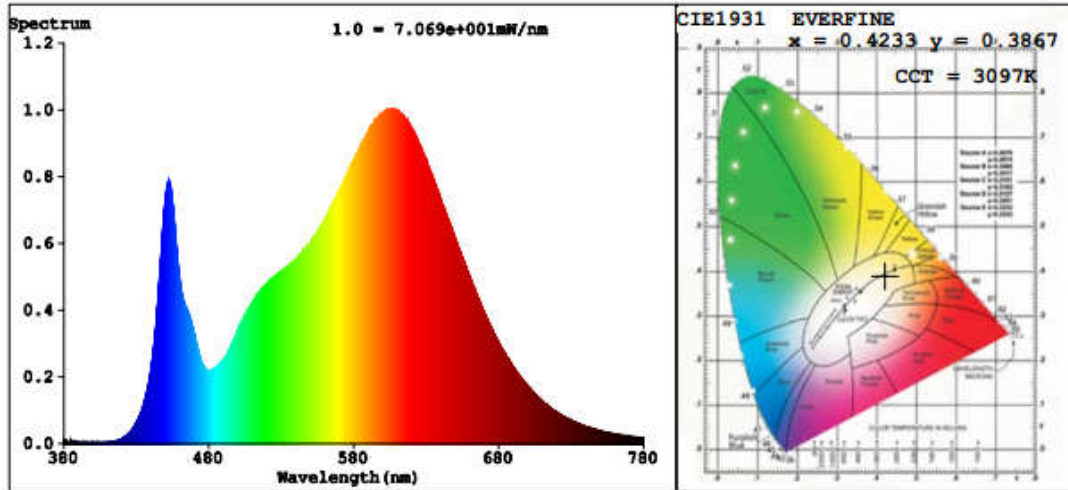
Chromaticity Measurement in Lithonia 2GT8 lensed 2x2- Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	86	R9	23
Frequency (Hz)	60	R2	95	R10	88
CCT (K)	3097	R3	95	R11	84
Duv	-0.0052	R4	84	R12	76
Chromaticity (x, y)	x=0.4233 y=0.3867	R5	87	R13	89
Chromaticity (u', v')	u'=0.2492 v'=0.5123	R6	93	R14	98
Color Rendering Index (CRI)	85.8	R7	83	R15	80
R9	23	R8	65	--	--

Photometric Measurement in Lithonia 2GT8 lensed 2x2- Goniophotometer Method:

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3676.9	3639.7	>=2000(-10%)	
Luminous Efficacy (lm/W)	123.01	122.84	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	121.77		100(-3%)	125(-3%)
Zonal lumens in the 0-60° zone (%)	84.6	--	>= 75(-3)	
SC: 0-180° (if applicable)	1.28	--	1.0-2.0(±0.1)	
SC: 90-270° (if applicable)	1.14	--	1.0-2.0(±0.1)	
Beam Angle (°)	95.7	--	--	
Center Beam Candle Power (cd)	1563	--	--	

Spectral Power Distribution & Chromaticity Diagram

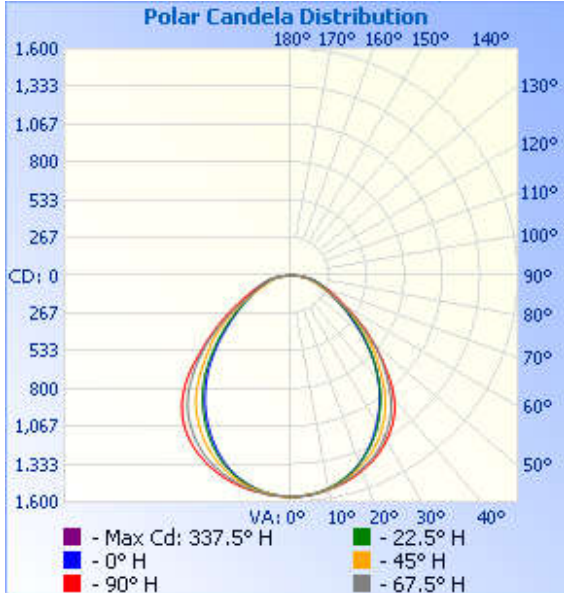


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,198.4	32.6%
0-40	1,928.0	52.4%
0-60	3,110.4	84.6%
60-90	549.7	15%
70-100	244.8	6.7%
90-120	7.0	0.2%
0-90	3,660.2	99.6%
90-180	16.2	0.4%
0-180	3,676.4	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	147.7	4.0%	90-100	1.9	0.1%
10-20	421.3	11.5%	100-110	2.5	0.1%
20-30	629.4	17.1%	110-120	2.6	0.1%
30-40	729.6	19.8%	120-130	2.7	0.1%
40-50	679.2	18.5%	130-140	2.3	0.1%
50-60	503.2	13.7%	140-150	1.8	0%
60-70	306.8	8.3%	150-160	1.3	0%
70-80	181.6	4.9%	160-170	0.8	0%
80-90	61.4	1.7%	170-180	0.3	0%

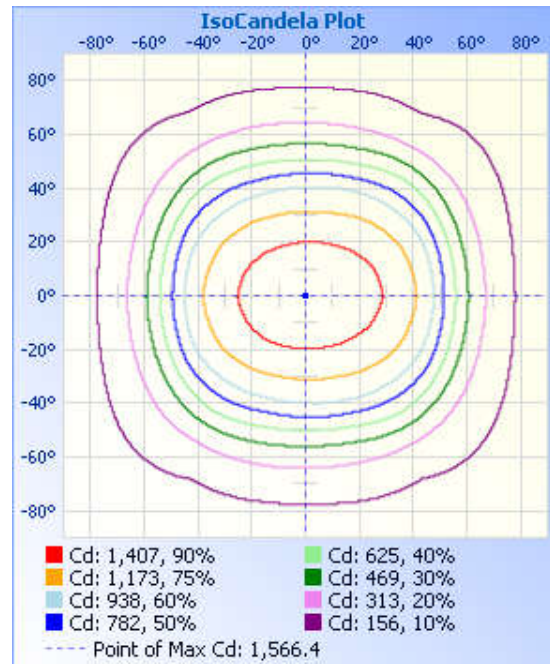
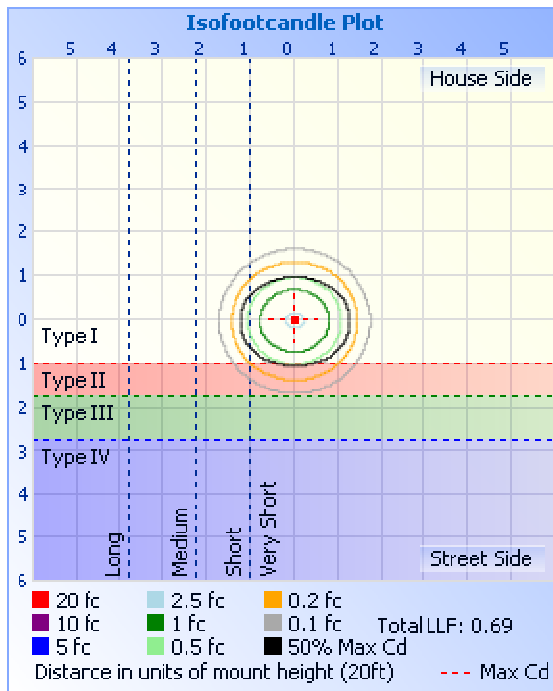
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
12.0ft	10.86 fc	24.2 ft	29.2 ft
24.0ft	2.71 fc	48.3 ft	58.3 ft
36.0ft	1.21 fc	72.5 ft	87.5 ft
48.0ft	0.68 fc	96.6 ft	116.6 ft
60.0ft	0.43 fc	120.8 ft	145.8 ft

■ Vert. Spread: 90.4°
■ Horiz. Spread: 101.1°



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Table--1

UNIT: cd

C (DEG) γ (DEG)	0	23	45	68	90	113	135	158	180	203	225	248	270	293	315	338	
0	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	1563	
5	1560	1561	1561	1559	1555	1554	1553	1553	1556	1555	1556	1555	1553	1554	1552	1556	
10	1544	1544	1540	1534	1527	1526	1531	1535	1536	1532	1530	1524	1521	1524	1529	1539	
15	1522	1520	1505	1489	1481	1480	1493	1503	1509	1498	1488	1473	1471	1474	1492	1511	
20	1491	1481	1454	1424	1412	1415	1435	1456	1467	1453	1430	1406	1395	1406	1437	1471	
25	1447	1430	1385	1340	1322	1328	1365	1401	1416	1393	1356	1315	1299	1317	1363	1418	
30	1388	1363	1300	1239	1209	1223	1274	1320	1346	1314	1259	1201	1185	1209	1274	1343	
35	1310	1273	1198	1122	1091	1102	1158	1222	1258	1213	1142	1075	1061	1089	1166	1253	
40	1199	1157	1071	995	956	963	1018	1089	1133	1080	996	929	919	953	1032	1134	
45	1038	998	908	840	810	812	865	935	955	927	845	777	765	793	869	974	
50	828	818	755	678	656	671	725	774	778	757	703	636	611	638	721	800	
55	642	628	596	534	513	533	574	594	610	575	546	498	478	495	562	611	
60	478	448	431	401	399	405	424	430	456	418	397	379	373	374	402	433	
65	345	314	292	303	310	311	300	314	346	306	280	293	293	289	274	302	
70	256	228	200	237	242	245	212	234	259	228	198	231	232	229	192	221	
75	187	169	149	182	189	186	155	172	189	167	148	175	182	176	148	164	
80	127	112	112	126	134	128	116	117	131	114	108	119	126	123	109	111	
85	55.7	52.8	55.8	66.4	67.1	67.3	56.8	54.7	58.0	53.5	48.7	57.7	55.4	60.1	50.5	51.1	
90	1.89	1.67	2.37	2.67	1.86	2.32	1.79	2.05	1.20	1.13	1.58	2.41	1.43	2.33	7.24	1.28	
95	0.90	1.13	2.13	1.80	1.43	1.87	0.98	1.21	1.16	0.90	1.89	1.65	1.47	1.94	1.89	1.36	
100	2.62	2.63	2.64	1.84	1.47	1.84	1.51	1.58	1.96	1.88	2.40	1.51	1.43	1.91	3.02	3.47	
105	4.43	3.68	2.72	1.87	1.53	1.87	1.99	2.28	2.53	2.12	2.19	1.97	1.75	1.88	2.50	4.07	
110	3.39	3.11	2.75	2.15	1.63	2.18	2.34	2.55	2.64	2.41	2.64	2.14	1.96	1.94	2.53	2.87	
115	3.09	3.23	2.83	2.36	1.84	2.29	2.49	2.70	3.09	2.93	2.88	2.26	2.18	1.97	2.57	3.04	
120	3.14	3.36	3.07	2.51	1.88	2.56	2.79	3.32	3.39	3.24	3.04	2.58	2.29	2.49	2.54	3.06	
125	3.39	3.61	3.11	2.78	2.52	2.85	3.29	3.71	3.58	3.33	3.09	2.68	2.79	2.76	2.52	3.09	
130	3.49	3.51	3.04	2.93	2.63	2.83	2.87	3.76	3.65	3.36	2.72	2.78	3.16	2.86	2.50	2.87	
135	3.45	3.41	2.83	2.92	2.98	2.81	2.80	3.85	3.37	3.16	2.64	2.82	6.47	2.90	2.55	2.79	
140	3.40	3.31	2.55	2.88	3.05	2.79	2.72	3.21	3.16	3.25	2.55	2.71	2.88	2.95	2.61	2.79	
145	3.35	3.16	2.27	2.81	3.12	2.77	2.46	3.06	3.16	3.39	2.52	2.71	2.91	3.00	2.63	2.56	
150	3.27	3.06	2.24	2.67	3.22	2.75	2.23	3.02	3.16	3.46	2.49	2.71	2.90	3.09	2.64	2.41	
155	3.09	2.86	2.22	2.57	3.22	2.72	2.13	2.97	3.13	3.01	2.55	2.69	2.78	3.11	2.64	2.33	
160	2.96	2.57	2.19	2.47	3.13	2.70	2.11	2.83	3.09	2.85	2.61	2.67	2.78	3.13	2.73	2.15	
165	2.83	2.41	2.19	2.37	3.09	2.48	2.23	2.77	3.05	2.83	2.63	2.66	2.78	3.15	2.83	2.34	
170	2.81	2.41	2.48	2.62	3.02	2.69	2.39	2.71	3.01	2.81	2.64	2.64	3.46	3.45	2.94	2.37	
175	2.79	2.41	2.44	2.89	3.61	3.08	2.41	2.65	2.85	2.79	2.55	2.54	3.16	3.61	3.05	2.40	
180	2.78	2.55	2.42	3.01	3.54	2.93	2.42	2.57	2.86	2.78	2.57	2.40	3.01	3.53	3.10	2.41	

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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	15G312-113		

Electrical Measurement in Lithonia 2GT8 lensed 2x2:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.2539	29.92	0.9822	13.08
0-K2	277.0	60	0.1152	29.73	0.9318	12.89
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

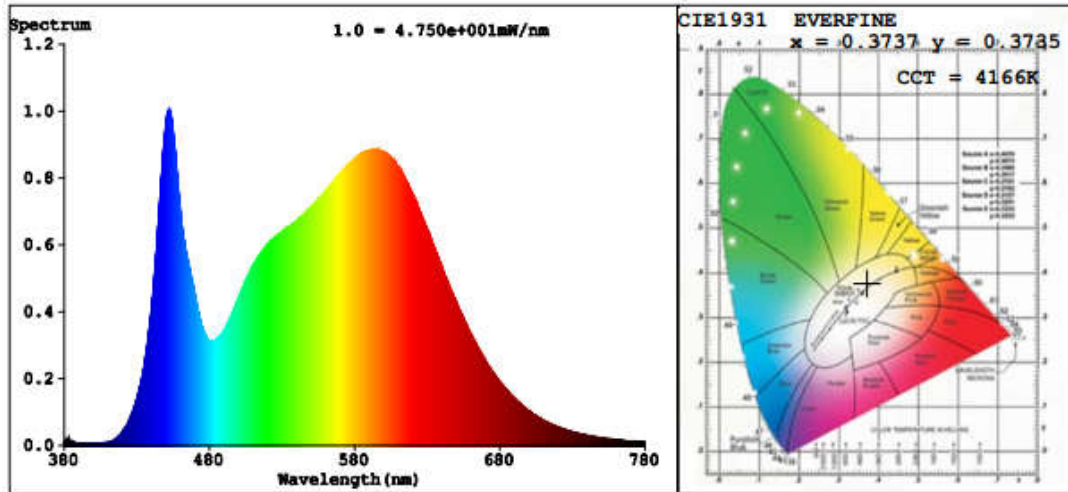
**Chromaticity Measurement in Lithonia 2GT8 lensed 2x2-
 Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	7
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	4166	R3	96	R11	80
Duv	0.0005	R4	81	R12	63
Chromaticity (x, y)	x=0.3737 y=0.3735	R5	82	R13	84
Chromaticity (u', v')	u'=0.2220 v'=0.4991	R6	86	R14	98
Color Rendering Index (CRI)	83.4	R7	86	R15	75
R9	7	R8	64	--	--

**Photometric Measurement in Lithonia 2GT8 lensed
 2x2–Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3718	3680	>=2000(-10%)	
Luminous Efficacy (lm/W)	124.26	123.78	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	122.99		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	15G312-115		

Electrical Measurement in Lithonia 2GT8 lensed 2x2:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180307	120.0	60	0.2543	29.97	0.9821	13.09
0-K3	277.0	60	0.1153	29.76	0.9319	12.91
DLC Pass Criteria					>= 0.9(-3%)	<= 20(+5)

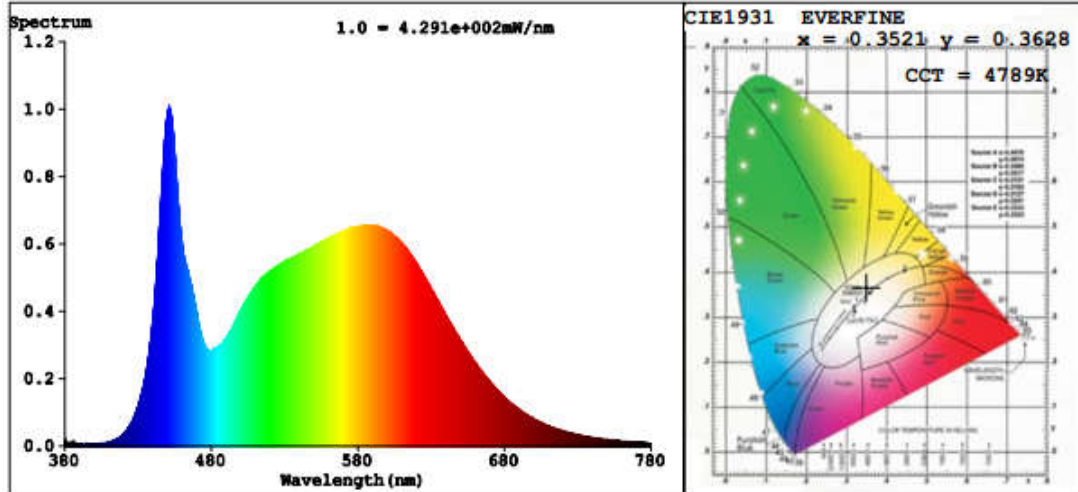
**Chromaticity Measurement in Lithonia 2GT8 lensed 2x2-
 Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	82	R9	10
Frequency (Hz)	60	R2	90	R10	75
CCT (K)	4789	R3	95	R11	81
Duv	0.0028	R4	82	R12	59
Chromaticity (x, y)	x=0.3521 y=0.3628	R5	82	R13	84
Chromaticity (u', v')	u'=0.2118 v'=0.4910	R6	85	R14	97
Color Rendering Index (CRI)	83.8	R7	88	R15	76
R9	10	R8	67	--	--

**Photometric Measurement in Lithonia 2GT8 lensed
 2x2–Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	120.0	277.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	3766	3728	>=2000(-10%)	
Luminous Efficacy (lm/W)	125.66	125.27	Standard: >=	Premium: >=
Most Worst Luminous/Highest Watts	124.39		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)
15G312-111	3000K	3676.9	29.89	123.01
15G312-112	3500K	3697 ^{*1}	29.91 ^{*2}	123.60 ^{*3}
15G312-113	4000K	3718	29.92	124.26
15G312-115	5000K	3766	29.97	125.66

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

$$3697 = (3718 - 3676.9) / 2 + 3676.9$$

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

$$29.91 = (29.92 + 29.89) / 2$$

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

$$123.60 = 3697 / 29.91$$

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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