

LM-79-08 Test Report

For

RAB LIGHTING INC

(Brand Name : RAB)

170 Ludlow Ave , PO BOX 970, Northvale, NJ 07647-2305 USA

Model name(s) :

DLG0019(GR2TL)

Report Type: Testing and Report According to IES LM-79-2008

Type of Luminaire: Downlights

Report Date: 2023-12-18

1.1 Rated Values:	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	6W
Rated Initial Lamp Lumen	420lm (3000k) , 450lm (5000k)
Declared CCT	2700k/3000k/3500k/4000k/5000k

1.2 Test Specifications:

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 C78.377-2015 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>

2.1.1 Electrical, Photometric and Chromaticity Measurements

Test date	2023-12-18	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0019 (GR2TL)	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.052	6.03	0.961

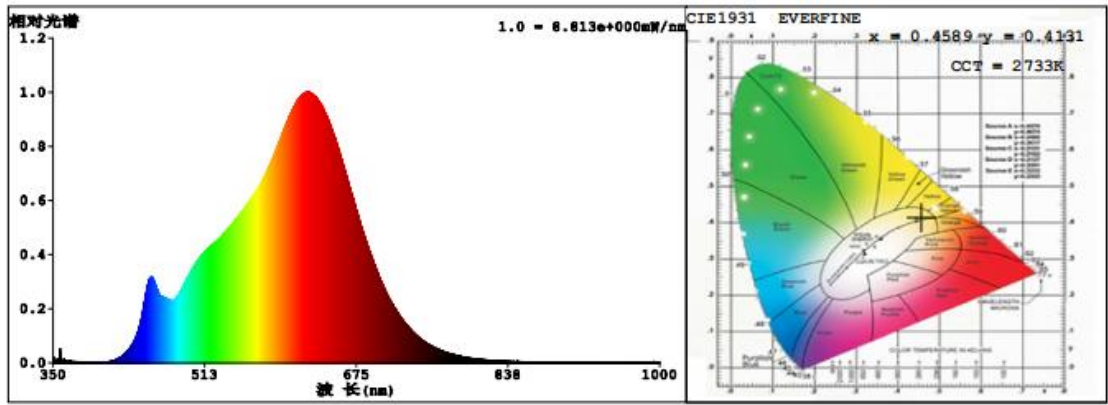
Chromaticity Measurement – Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	96	R9	64
Frequency (Hz)	60	R2	99	R10	98
CCT (K)	2733	R3	98	R11	98
Duv	0.00102	R4	95	R12	89
Chromaticity (x, y)	x=0.4589, y=0.4131	R5	96	R13	97
Chromaticity (u', v')	u' =0.2607, v' =0.5285	R6	97	R14	99
Color Rendering Index (CRI)	94.5	R7	91	R15	91
R9	64	R8	83	--	--

Photometric Measurement – Goniophotometer Method:

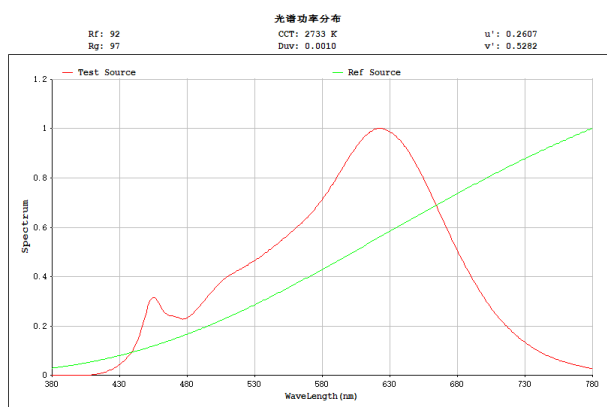
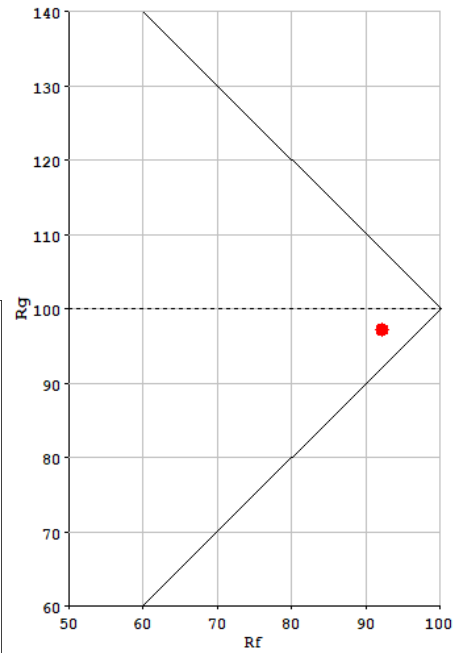
Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	403.318
Luminous Efficacy (lm/W)	66.87
Beam Angle (°)	38.3
Center Beam Candle Power (cd)	864.9

Spectral Power Distribution & Chromaticity Diagram

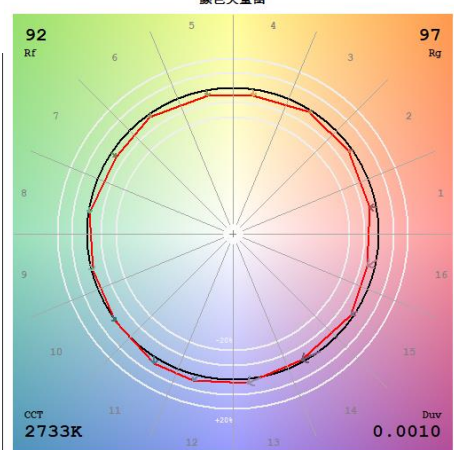


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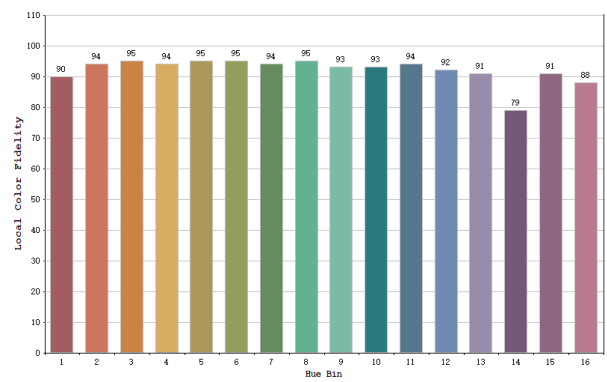
Rf-Rg关系



颜色矢量图



逼真度分布

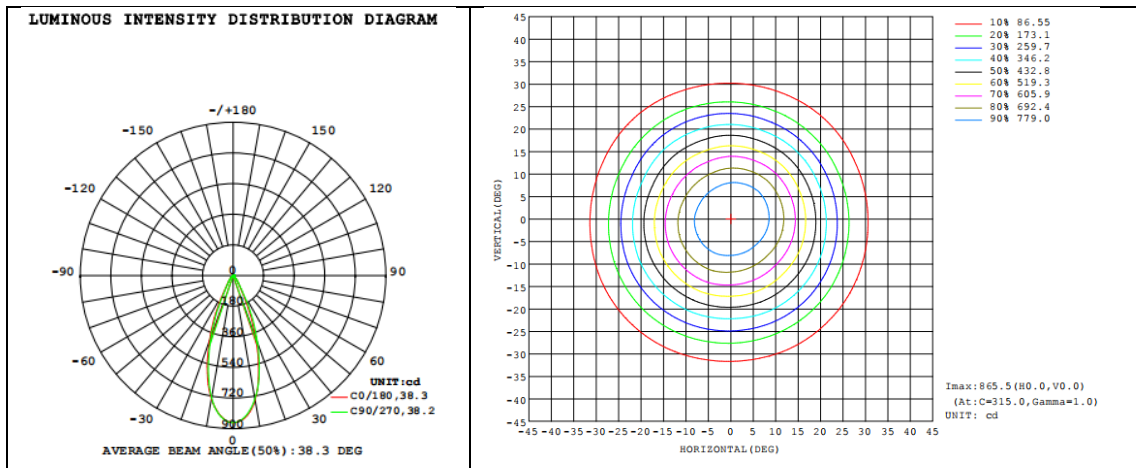


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	339.83	84.3%
0-40	376.01	93.2%
0-60	398.767	98.9%
60-90	4.5246	1.1%
70-100	1.9476	0.5%
90-120	0	0.0%
0-90	403.2916	100.0%
90-180	0	0.0%
0-180	403.2916	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	76.43	19.0%	90-100	0	0%
10-20	158.7	39.4%	100-110	0	0%
20-30	104.7	26.0%	110-120	0	0%
30-40	36.18	9.0%	120-130	0	0%
40-50	16.19	4.0%	130-140	0	0%
50-60	6.567	1.6%	140-150	0	0%
60-70	2.577	0.6%	150-160	0	0%
70-80	1.556	0.4%	160-170	0	0%
80-90	0.3916	0.1%	170-180	0	0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2023-12-18	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0019 (GR2TL)	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.051	5.91	0.959

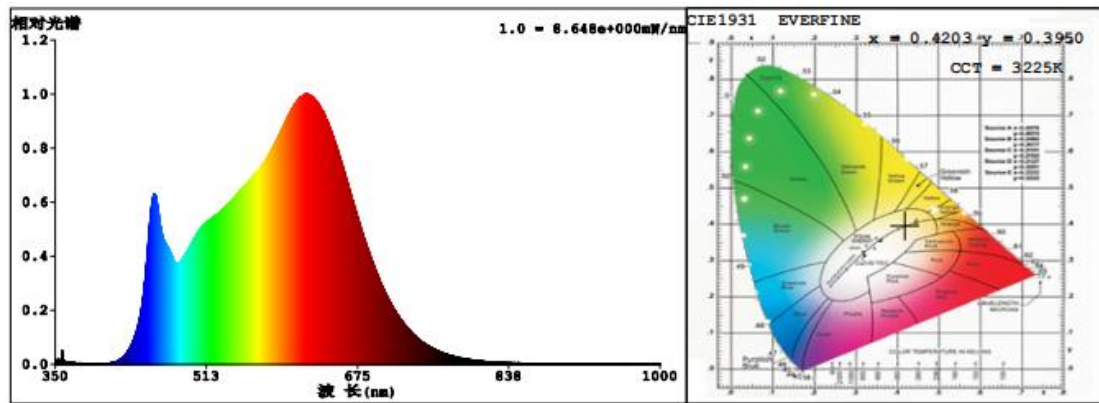
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	74
Frequency (Hz)	60	R2	98	R10	97
CCT (K)	3225	R3	96	R11	98
Duv	-0.00113	R4	95	R12	82
Chromaticity (x, y)	x=0.4203, y=0.3950	R5	97	R13	100
Chromaticity (u', v')	u' =0.2437, v' =0.5153	R6	95	R14	98
Color Rendering Index (CRI)	94.6	R7	91	R15	94
R9	74	R8	87	--	--

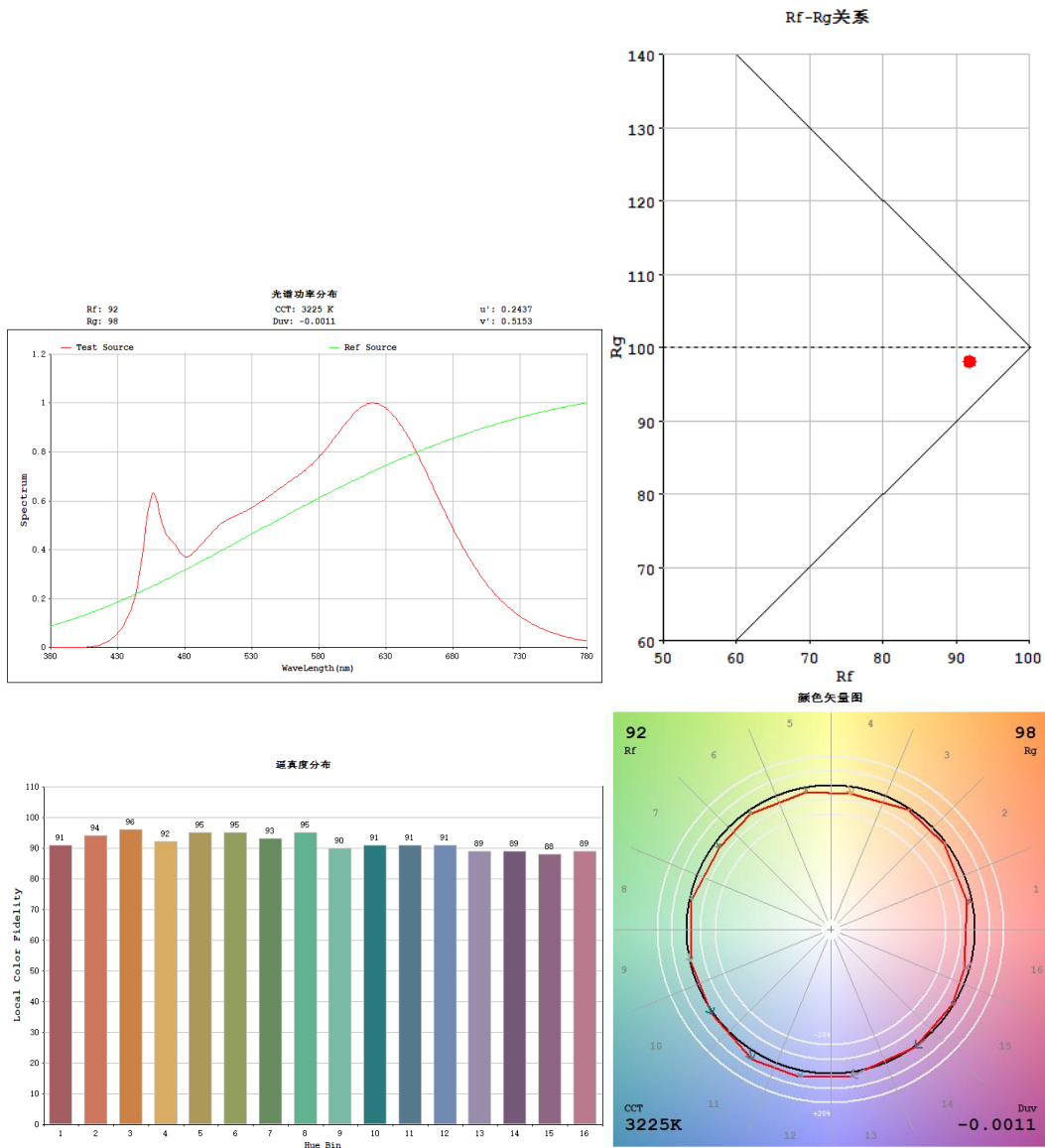
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	442.886
Luminous Efficacy (lm/W)	74.99
Beam Angle (°)	38.3
Center Beam Candle Power (cd)	945.8

Spectral Power Distribution & Chromaticity Diagram



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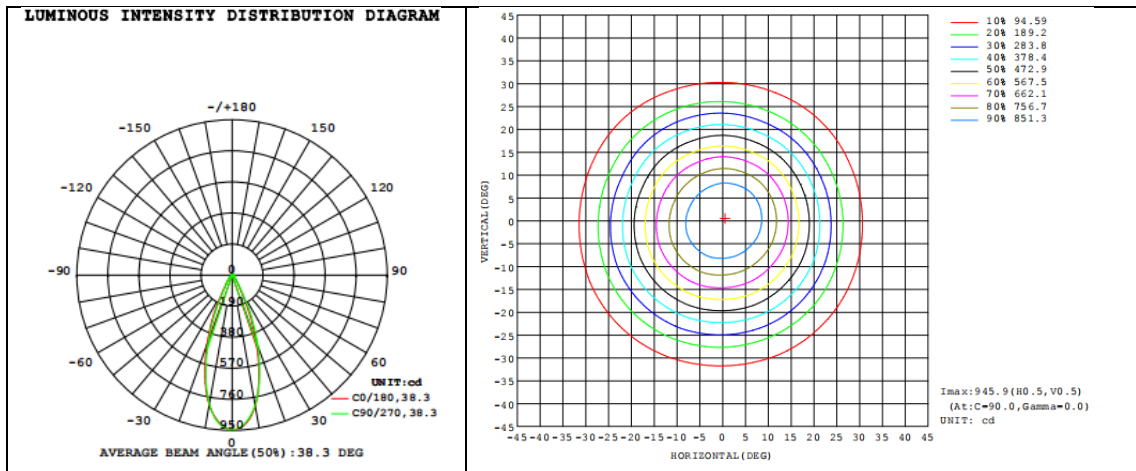


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	372.91	84.2%
0-40	412.77	93.2%
0-60	437.809	98.9%
60-90	5.0206	1.1%
70-100	2.1716	0.5%
90-120	0	0.0%
0-90	442.8296	100.0%
90-180	0	0.0%
0-180	442.8296	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	83.71	18.9%	90-100	0	0%
10-20	174	39.3%	100-110	0	0%
20-30	115.2	26.0%	110-120	0	0%
30-40	39.86	9.0%	120-130	0	0%
40-50	17.81	4.0%	130-140	0	0%
50-60	7.229	1.6%	140-150	0	0%
60-70	2.849	0.6%	150-160	0	0%
70-80	1.727	0.4%	160-170	0	0%
80-90	0.4446	0.1%	170-180	0	0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2023-12-18	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0019 (GR2TL)	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.050	5.78	0.957

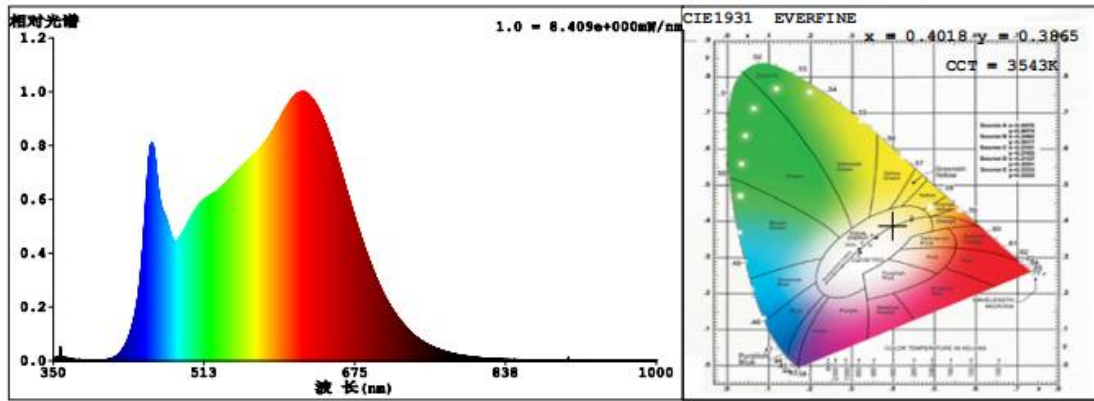
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	76
Frequency (Hz)	60	R2	98	R10	97
CCT (K)	3543	R3	96	R11	97
Duv	-0.00108	R4	94	R12	80
Chromaticity (x, y)	x=0.4018, y=0.3865	R5	96	R13	99
Chromaticity (u', v')	u' =0.2352, v' =0.5090	R6	95	R14	99
Color Rendering Index (CRI)	94.6	R7	92	R15	95
R9	76	R8	88	--	--

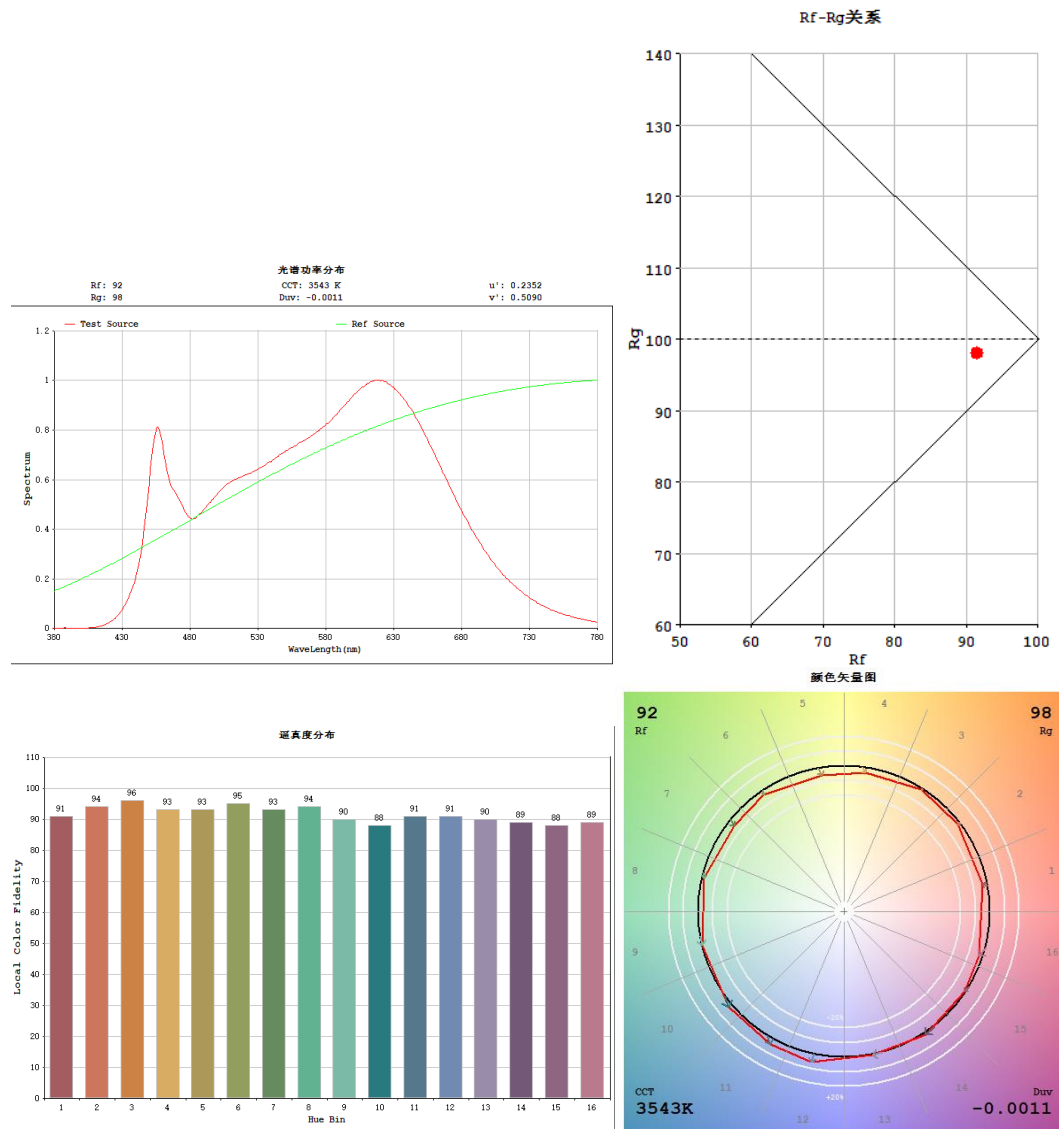
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	467.256
Luminous Efficacy (lm/W)	80.81
Beam Angle (°)	38.4
Center Beam Candle Power (cd)	995.3

Spectral Power Distribution & Chromaticity Diagram



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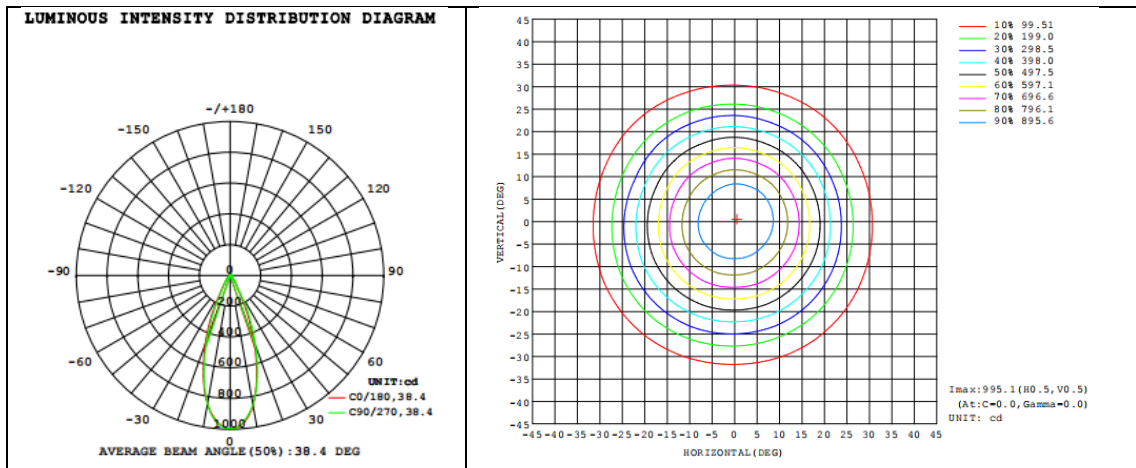


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	393.36	84.2%
0-40	435.54	93.2%
0-60	462.016	98.9%
60-90	5.3348	1.1%
70-100	2.3138	0.5%
90-120	0	0.0%
0-90	467.3508	100.0%
90-180	0	0.0%
0-180	467.3508	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	88.16	18.9%	90-100	0	0%
10-20	183.4	39.2%	100-110	0	0%
20-30	121.8	26.1%	110-120	0	0%
30-40	42.18	9.0%	120-130	0	0%
40-50	18.83	4.0%	130-140	0	0%
50-60	7.646	1.6%	140-150	0	0%
60-70	3.021	0.6%	150-160	0	0%
70-80	1.835	0.4%	160-170	0	0%
80-90	0.4788	0.1%	170-180	0	0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2023-12-18	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0019 (GR2TL)	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.051	5.85	0.958

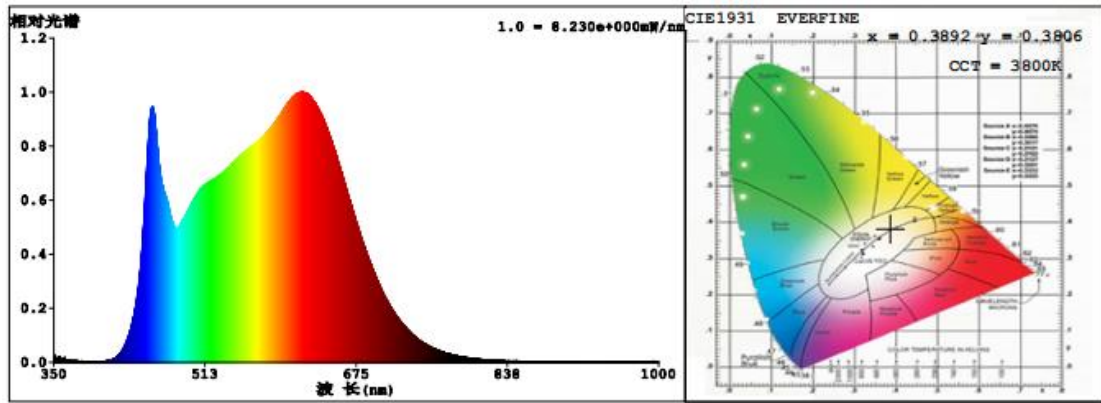
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	98	R9	76
Frequency (Hz)	60	R2	98	R10	98
CCT (K)	3800	R3	96	R11	96
Duv	-0.000639	R4	94	R12	78
Chromaticity (x, y)	x=0.3892, y=0.3806	R5	96	R13	99
Chromaticity (u', v')	u' =0.2293, v' =0.5046	R6	95	R14	99
Color Rendering Index (CRI)	94.5	R7	92	R15	94
R9	76	R8	88	--	--

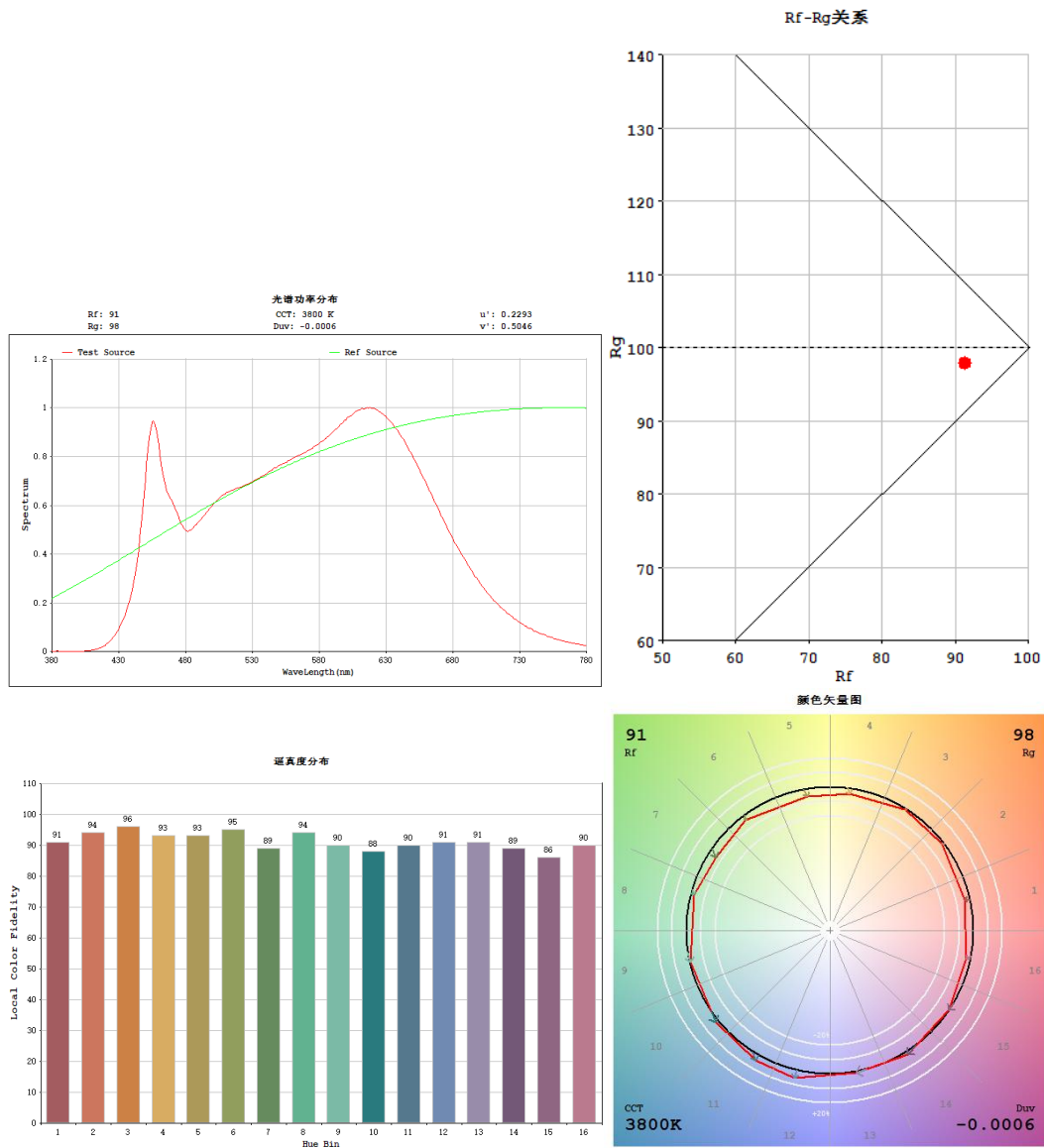
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	478.627
Luminous Efficacy (lm/W)	81.78
Beam Angle (°)	38.4
Center Beam Candle Power (cd)	1017

Spectral Power Distribution & Chromaticity Diagram



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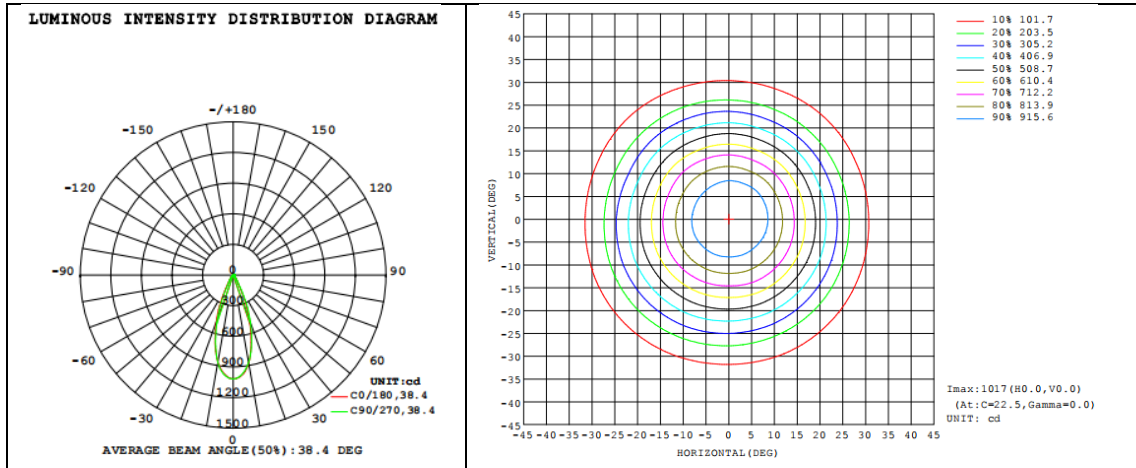


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	402.65	84.1%
0-40	445.97	93.2%
0-60	473.148	98.9%
60-90	5.4858	1.1%
70-100	2.3818	0.5%
90-120	0	0.0%
0-90	478.6338	100.0%
90-180	0	0.0%
0-180	478.6338	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	90.15	18.8%	90-100	0	0%
10-20	187.6	39.2%	100-110	0	0%
20-30	124.9	26.1%	110-120	0	0%
30-40	43.32	9.1%	120-130	0	0%
40-50	19.33	4.0%	130-140	0	0%
50-60	7.848	1.6%	140-150	0	0%
60-70	3.104	0.6%	150-160	0	0%
70-80	1.887	0.4%	160-170	0	0%
80-90	0.4948	0.1%	170-180	0	0%

Photometric Data



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2023-12-18	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	DLG0019 (GR2TL)	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120	60	0.052	6.05	0.961

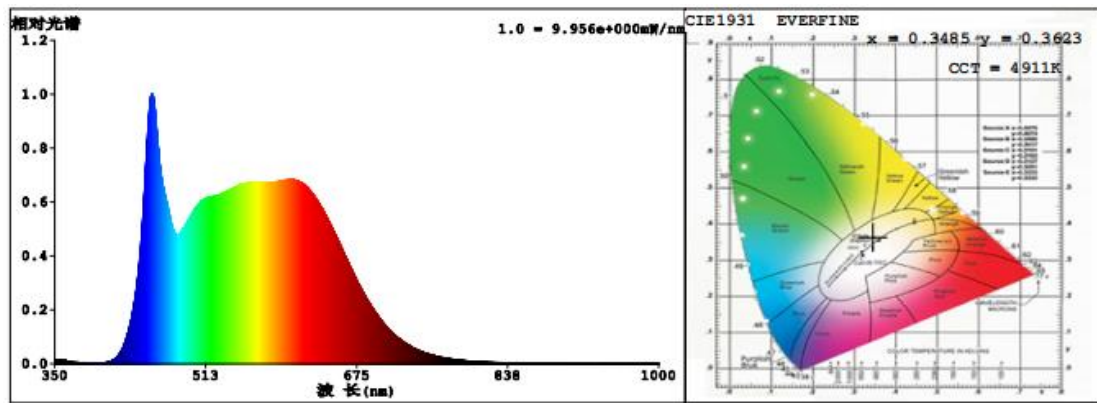
Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120	R1	93	R9	61
Frequency (Hz)	60	R2	98	R10	94
CCT (K)	4911	R3	97	R11	90
Duv	0.00392	R4	89	R12	70
Chromaticity (x, y)	x=0.3485, y=0.3623	R5	91	R13	95
Chromaticity (u', v')	u' =0.2096, v' =0.4903	R6	95	R14	99
Color Rendering Index (CRI)	92.2	R7	91	R15	89
R9	61	R8	84	--	--

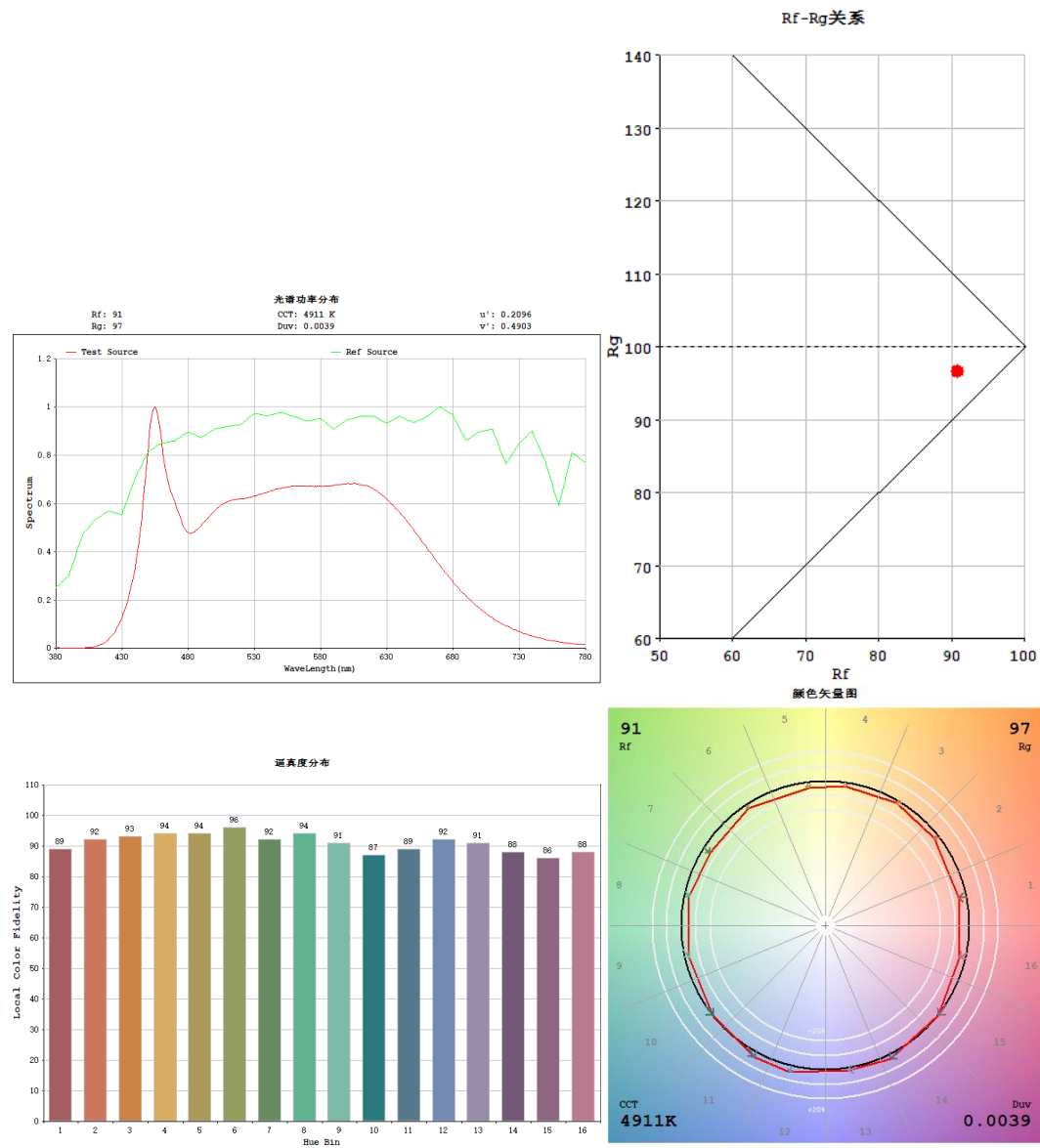
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120
Frequency (Hz)	60
Total Luminous (lm)	471.744
Luminous Efficacy (lm/W)	77.98
Beam Angle (°)	38.5
Center Beam Candle Power (cd)	998.1

Spectral Power Distribution & Chromaticity Diagram



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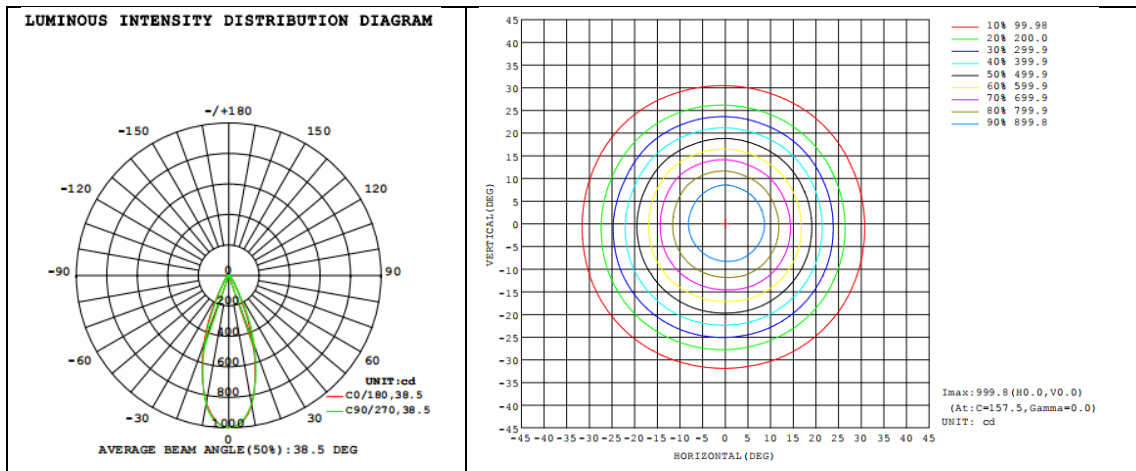


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	396.59	84.1%
0-40	439.48	93.2%
0-60	466.346	98.9%
60-90	5.4223	1.1%
70-100	2.3533	0.5%
90-120	0	0.0%
0-90	471.7683	100.0%
90-180	0	0.0%
0-180	471.7683	100.0%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	88.59	18.8%	90-100	0	0%
10-20	184.6	39.1%	100-110	0	0%
20-30	123.4	26.2%	110-120	0	0%
30-40	42.89	9.1%	120-130	0	0%
40-50	19.11	4.1%	130-140	0	0%
50-60	7.756	1.6%	140-150	0	0%
60-70	3.069	0.7%	150-160	0	0%
70-80	1.865	0.4%	160-170	0	0%
80-90	0.4883	0.1%	170-180	0	0%

Photometric Data



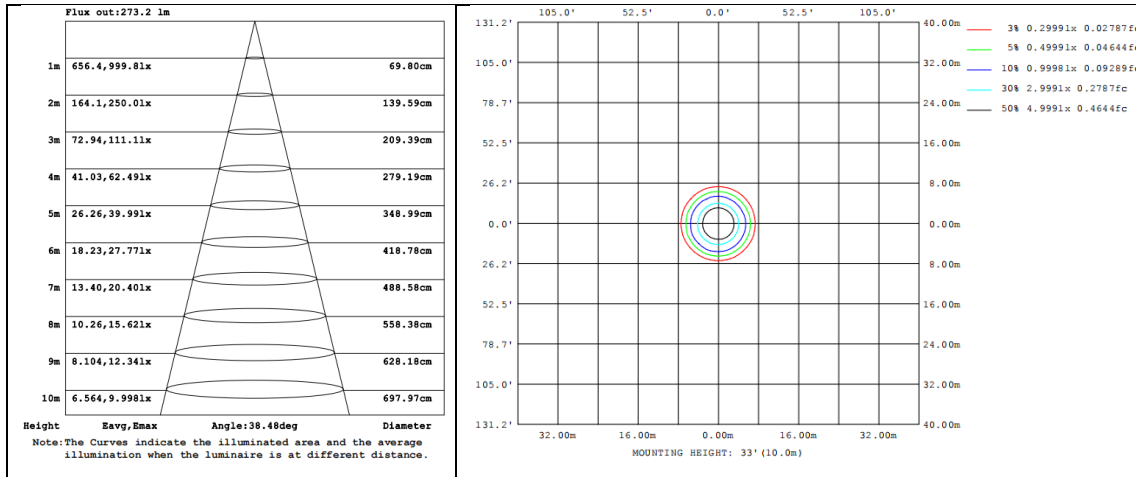


Table-1

C (DEG)		UNIT: cd																
Y (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5		
0	998	998	998	998	998	998	998	998	998	998	998	998	998	998	998	998		
5	968	966	965	964	962	962	960	961	959	957	958	960	965	968	969	969		
10	861	864	863	864	858	855	852	852	849	850	854	857	858	851	856	857		
15	672	688	699	696	682	686	690	685	673	673	683	670	662	654	661	663		
20	459	474	482	490	489	493	492	489	479	464	461	449	448	441	445	447		
25	252	268	281	294	303	310	310	306	289	264	261	252	243	236	235	240		
30	110	116	124	130	138	137	139	133	127	120	115	108	105	103	103	104		
35	64.0	65.2	66.1	67.2	67.3	67.5	67.6	67.6	66.5	65.3	64.5	62.8	62.1	61.6	61.9	62.1		
40	39.8	40.1	40.4	40.7	40.8	41.8	42.6	43.3	42.7	42.3	42.1	41.0	40.3	39.9	40.0	39.4		
45	21.7	21.8	22.0	22.5	22.7	23.9	24.9	26.1	26.2	25.9	25.9	25.0	24.3	23.2	22.6	21.7		
50	12.4	12.4	12.5	12.8	13.0	13.7	14.3	15.2	15.3	15.3	15.2	14.7	14.2	13.5	13.1	12.5		
55	7.42	7.26	7.24	7.53	7.88	8.45	8.94	9.51	9.71	9.79	9.77	9.49	9.15	8.69	8.22	7.68		
60	3.97	3.92	3.91	4.11	4.30	4.66	4.94	5.33	5.57	5.66	5.70	5.39	5.10	4.69	4.39	4.08		
65	2.65	2.57	2.59	2.57	2.66	2.75	2.92	3.06	3.18	3.27	3.20	3.13	3.00	2.91	2.77	2.70		
70	2.24	2.17	2.19	2.16	2.24	2.28	2.42	2.49	2.55	2.64	2.60	2.59	2.48	2.44	2.33	2.30		
75	1.62	1.55	1.57	1.56	1.65	1.70	1.83	1.91	1.98	2.06	2.01	1.99	1.88	1.83	1.72	1.68		
80	0.94	0.87	0.89	0.87	0.96	0.99	1.12	1.18	1.26	1.33	1.29	1.29	1.19	1.14	1.03	0.99		
85	0.29	0.21	0.25	0.23	0.31	0.34	0.45	0.48	0.55	0.63	0.60	0.61	0.52	0.49	0.38	0.34		
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Model Number	CCT setting	Test Voltage(V)	Flux(lm)	P(W)	Luminous Efficacy lm/W
DLG0019 (GR2TL)	2700K setting	120	403.318	6.03	66.87
	3000K setting	120	442.866	5.91	74.99
	3500K setting	120	467.256	5.78	80.81
	4000K setting	120	478.627	5.85	81.78
	5000K setting	120	471.744	6.05	77.98