

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) :

GR2TLB

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

Type of Luminaire: Downlights

Report Date: 2024-09-03

1.1 Rated Values:	
Rated Voltage / Frequency	120V, 60HZ
Nominal Power	6W
Rated Initial Lamp Lumen	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	2024-09-03	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR2TLB	CCT Setting	2700k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.051	5.86	0.956

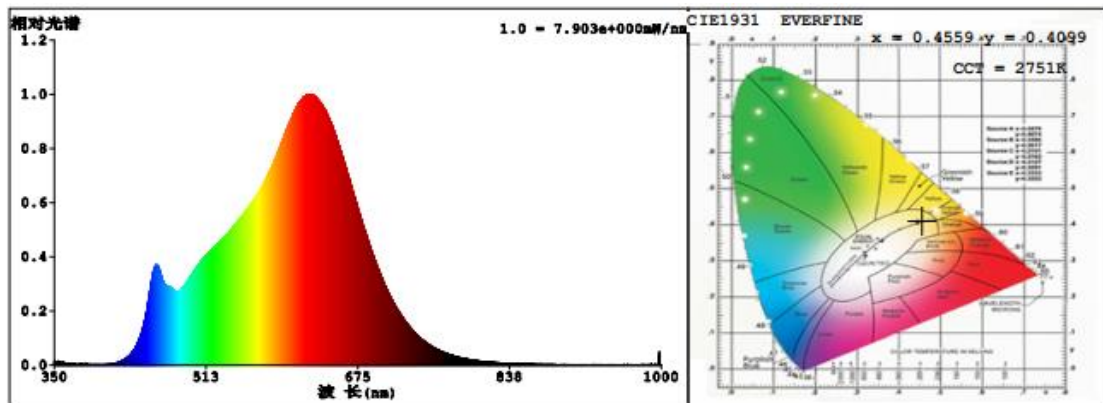
Chromaticity Measurement – Sphere-Spectroradiometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	2751
Duv	0.0000754
Chromaticity (x, y)	x=0.4559, y=0.4099
Chromaticity (u', v')	u' =0.2603, v' =0.5265
Color Rendering Index (CRI)	94.1
R9	68
Special Color Rendering Indices	
R1	97
R2	99
R3	96
R4	95
R5	97
R6	95
R7	91
R8	84
R9	68
R10	99
R11	97
R12	86
R13	99
R14	99
R15	92
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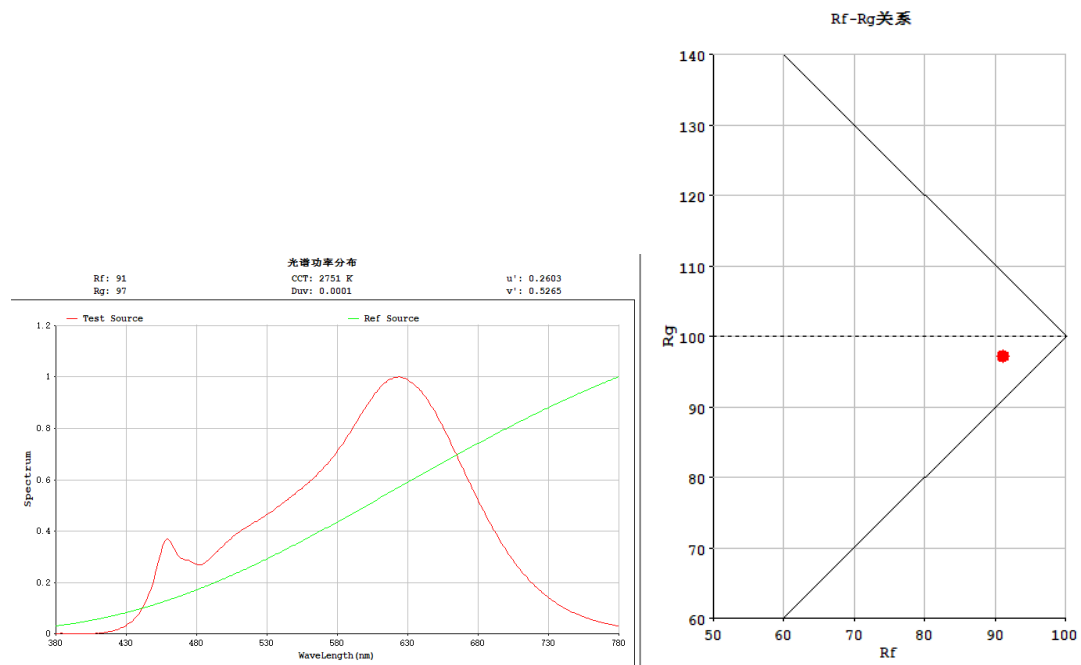
Photometric Measurement – Goniophotometer Method:

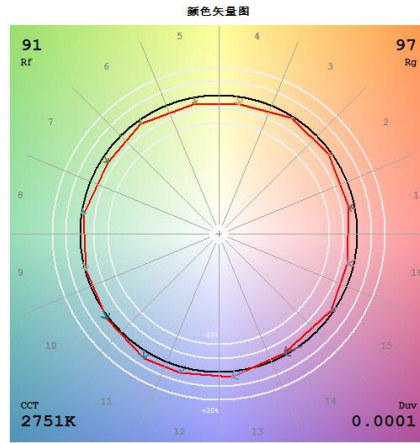
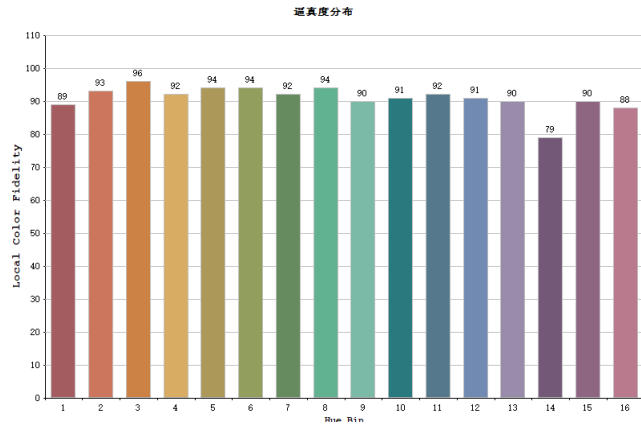
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	354.376
Luminous Efficacy (lm/W)	60.50
Beam Angle (°)	38.3
Center Beam Candle Power (cd)	787.4

Spectral Power Distribution & Chromaticity Diagram



TM30



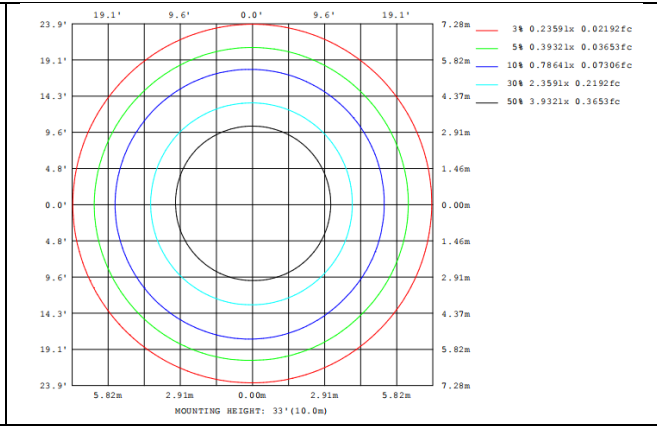
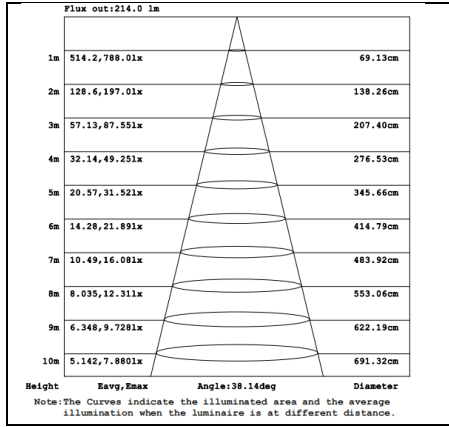
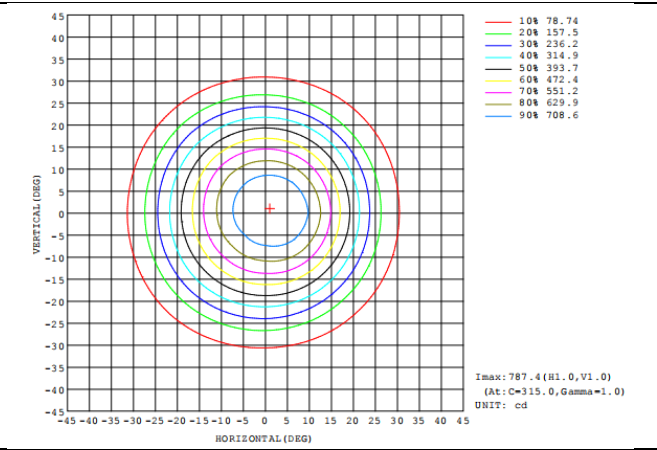
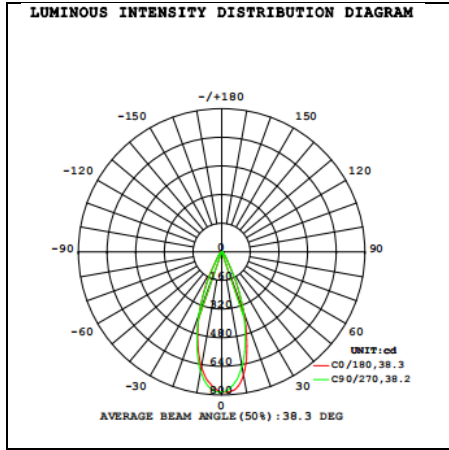


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	309.1	87.22%
0-40	340.5	96.08%
0-60	354.3	99.97%
60-90	0.1	0.03%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	354.4	100.00%
90-180	0.0	0.00%
0-180	354.4	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	69.55	19.62%	90-100	0	0%
10-20	144.5	40.77%	100-110	0	0%
20-30	95.04	26.82%	110-120	0	0%
30-40	31.44	8.87%	120-130	0	0%
40-50	11.23	3.17%	130-140	0	0%
50-60	2.622	0.74%	140-150	0	0%
60-70	0.0303	0.01%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data



2.1.2 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-03	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR2TLB	CCT Setting	3000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.050	5.77	0.955

Chromaticity Measurement – Sphere-Spectroradiometer Method:

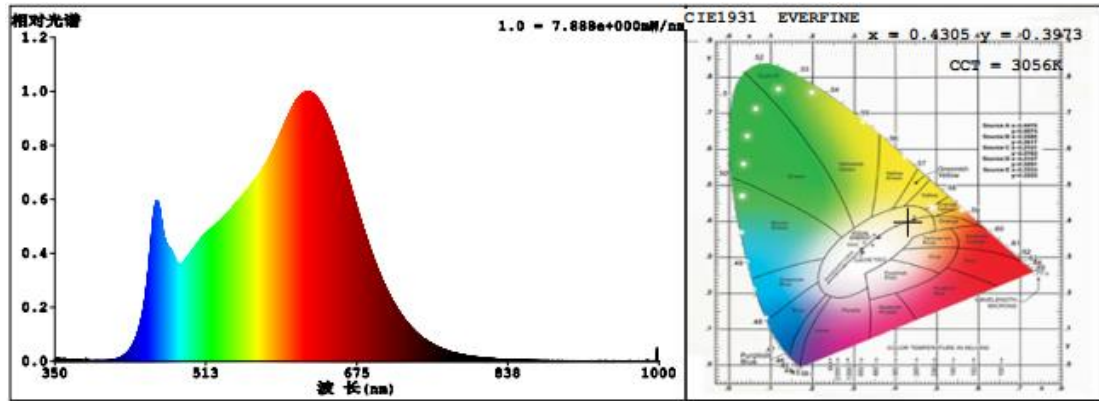
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3056
Duv	-0.00181
Chromaticity (x, y)	x=0.4305, y=0.3973
Chromaticity (u', v')	u' =0.2493, v' =0.5177
Color Rendering Index (CRI)	93.7
R9	75

Special Color Rendering Indices			
R1	98	R9	75
R2	97	R10	94
R3	94	R11	97
R4	94	R12	81
R5	97	R13	99
R6	93	R14	98
R7	90	R15	95
R8	86	--	--

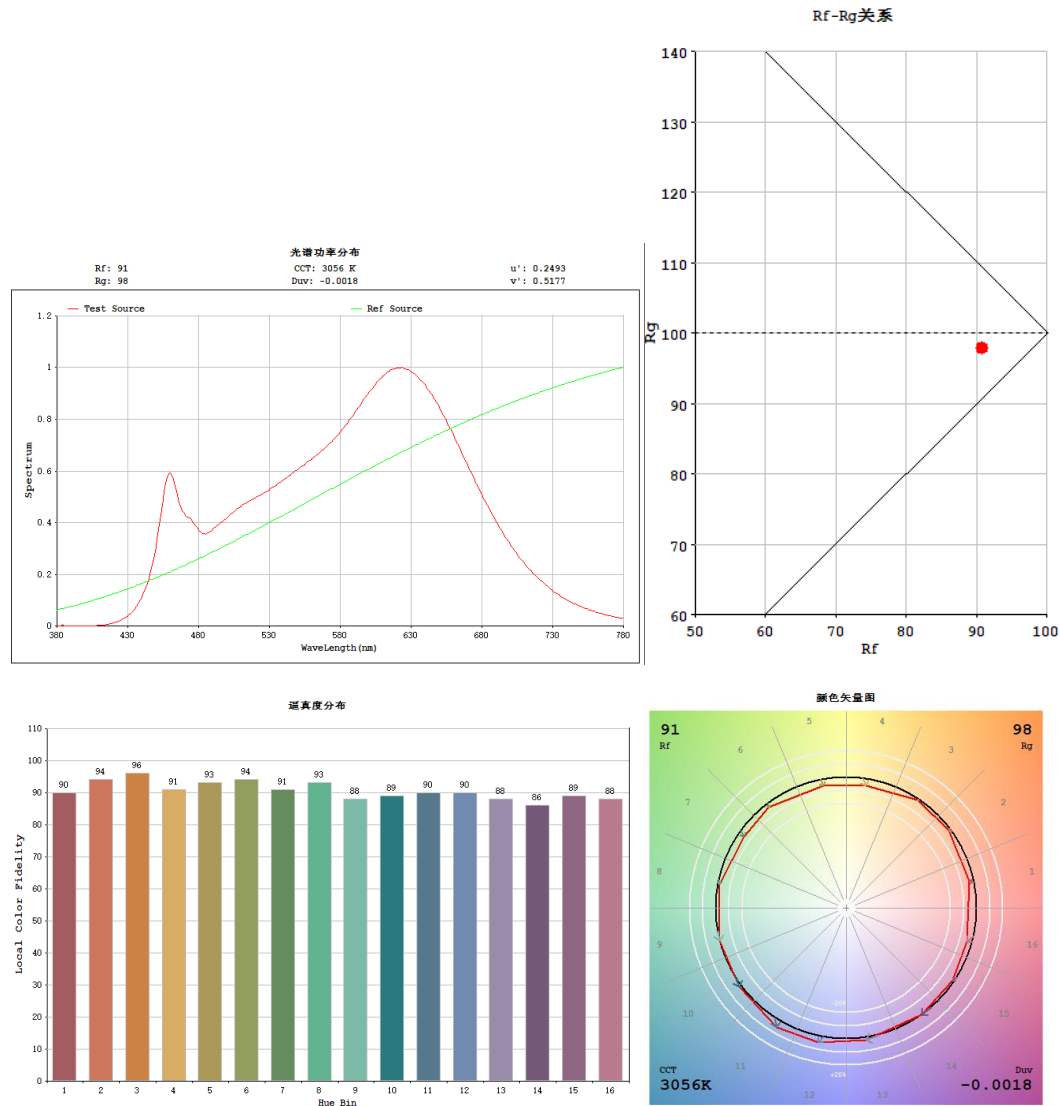
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	382.277
Luminous Efficacy (lm/W)	66.30
Beam Angle (°)	38.3
Center Beam Candle Power (cd)	848.1

Spectral Power Distribution & Chromaticity Diagram



TM30

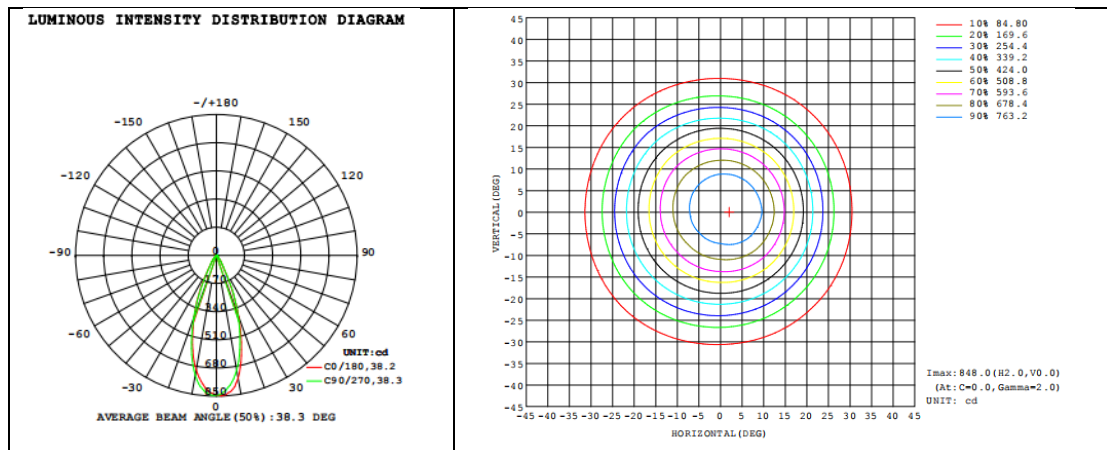


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	333.3	87.18%
0-40	367.3	96.08%
0-60	382.2	99.97%
60-90	0.1	0.03%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	382.3	100.00%
90-180	0.0	0.00%
0-180	382.3	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	74.89	19.59%	90-100	0	0%
10-20	155.6	40.70%	100-110	0	0%
20-30	102.80	26.89%	110-120	0	0%
30-40	33.98	8.89%	120-130	0	0%
40-50	12.14	3.18%	130-140	0	0%
50-60	2.841	0.74%	140-150	0	0%
60-70	0.0353	0.01%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data



2.1.3 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-03	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR2TLB	CCT Setting	3500k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.049	5.64	0.953

Chromaticity Measurement - Sphere-Spectroradiometer Method:

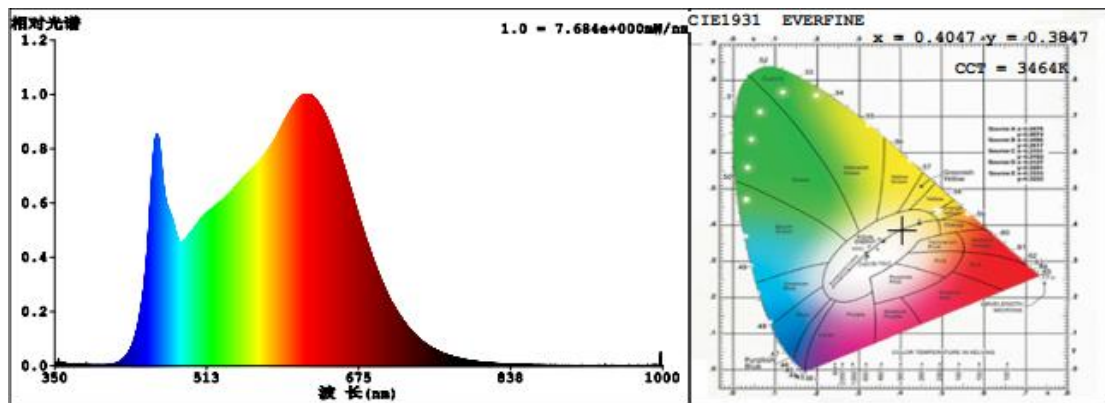
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3464
Duv	-0.00254
Chromaticity (x, y)	x=0.4047, y=0.3847
Chromaticity (u', v')	u' =0.2378, v' =0.5086
Color Rendering Index (CRI)	93.4
R9	80

Special Color Rendering Indices			
R1	98	R9	80
R2	96	R10	93
R3	94	R11	96
R4	93	R12	78
R5	96	R13	98
R6	92	R14	98
R7	90	R15	96
R8	88	--	--

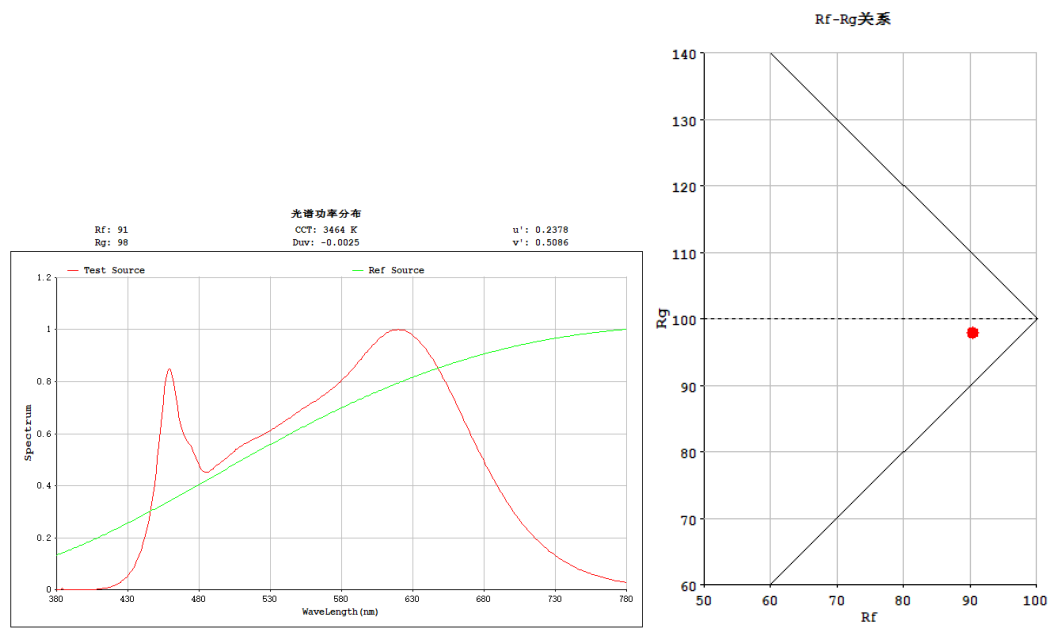
Photometric Measurement – Goniophotometer Method:

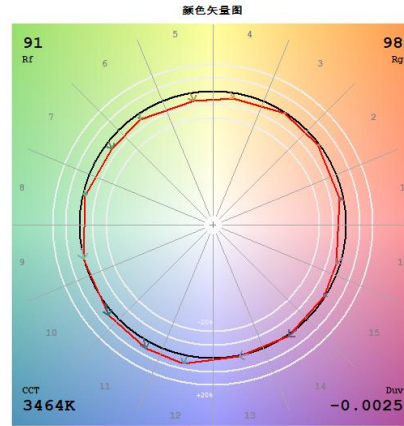
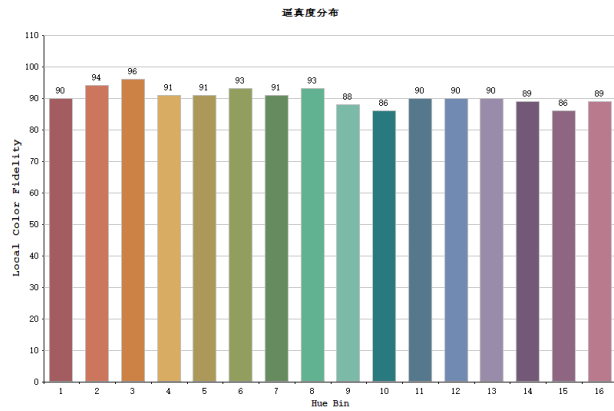
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	407.249
Luminous Efficacy (lm/W)	72.20
Beam Angle (°)	38.3
Center Beam Candle Power (cd)	902.9

Spectral Power Distribution & Chromaticity Diagram



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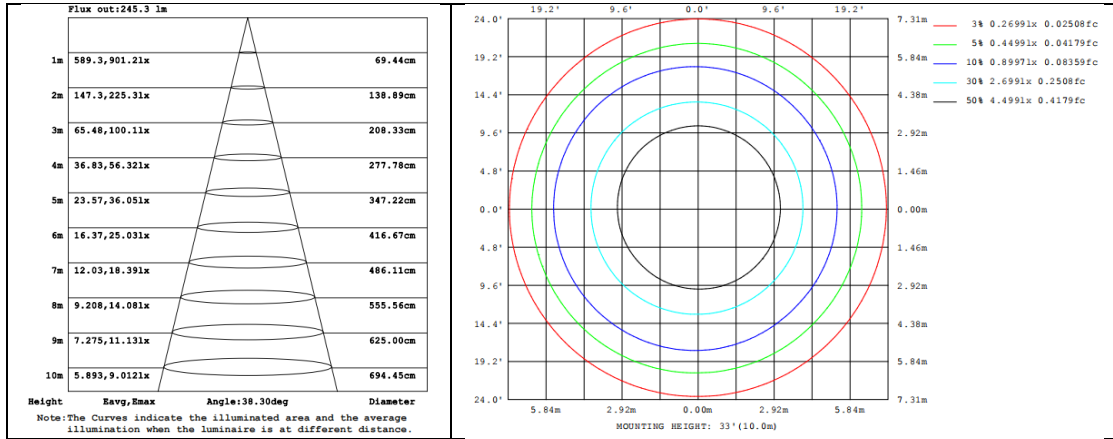
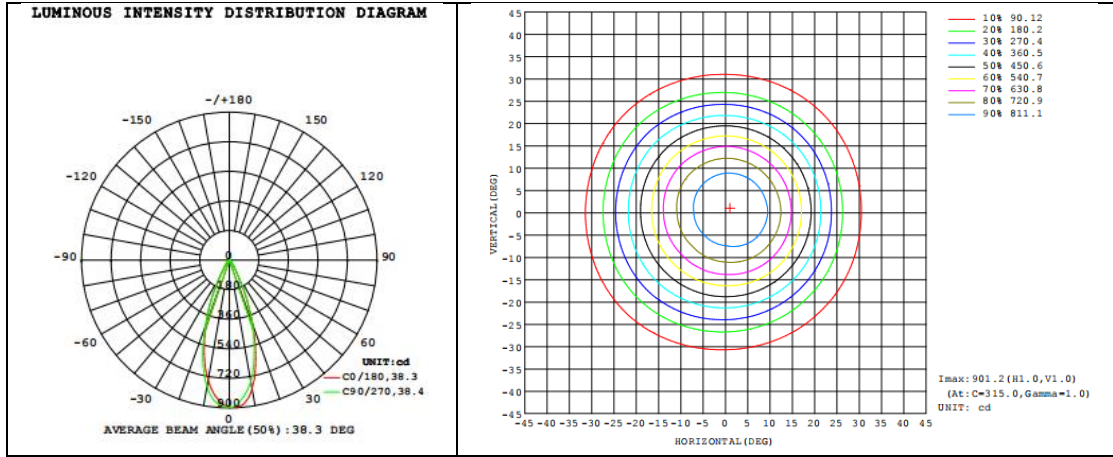


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	354.9	87.16%
0-40	391.2	96.07%
0-60	407.2	100.00%
60-90	0.0	0.00%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	407.2	100.00%
90-180	0.0	0.00%
0-180	407.2	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	79.61	19.55%	90-100	0	0%
10-20	165.7	40.69%	100-110	0	0%
20-30	109.60	26.92%	110-120	0	0%
30-40	36.30	8.91%	120-130	0	0%
40-50	12.96	3.18%	130-140	0	0%
50-60	3.040	0.75%	140-150	0	0%
60-70	0.0393	0.01%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data



2.1.4 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-03	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR2TLB	CCT Setting	4000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.049	5.65	0.954

Chromaticity Measurement - Sphere-Spectroradiometer Method:

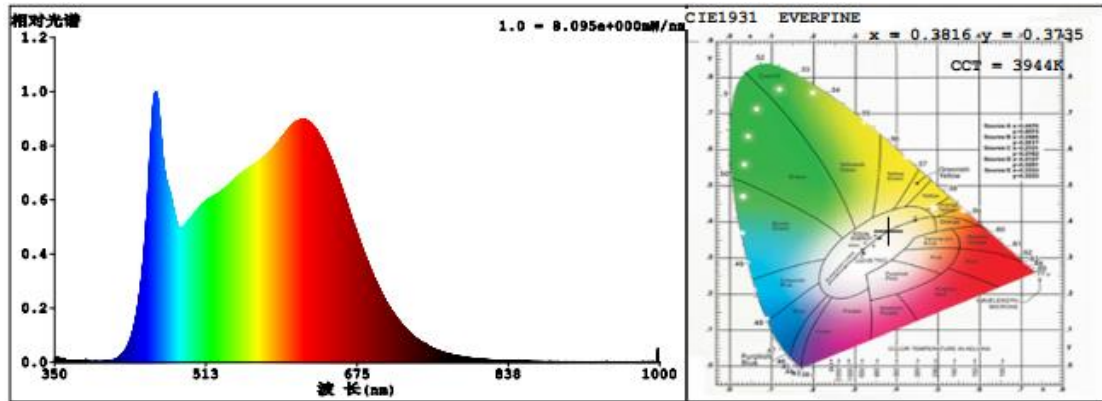
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	3944
Duv	-0.00189
Chromaticity (x, y)	x=0.3816, y=0.3735
Chromaticity (u', v')	u' =0.2272, v' =0.5003
Color Rendering Index (CRI)	93.3
R9	81

Special Color Rendering Indices			
R1	98	R9	81
R2	96	R10	94
R3	95	R11	95
R4	92	R12	75
R5	95	R13	98
R6	93	R14	98
R7	90	R15	95
R8	88	--	--

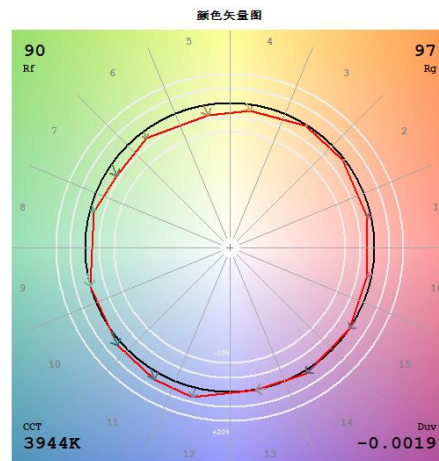
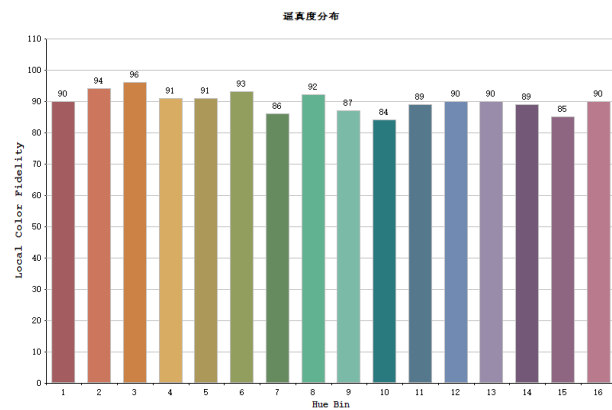
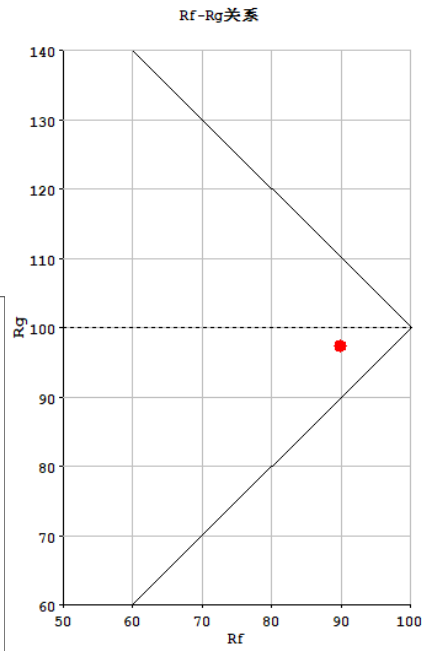
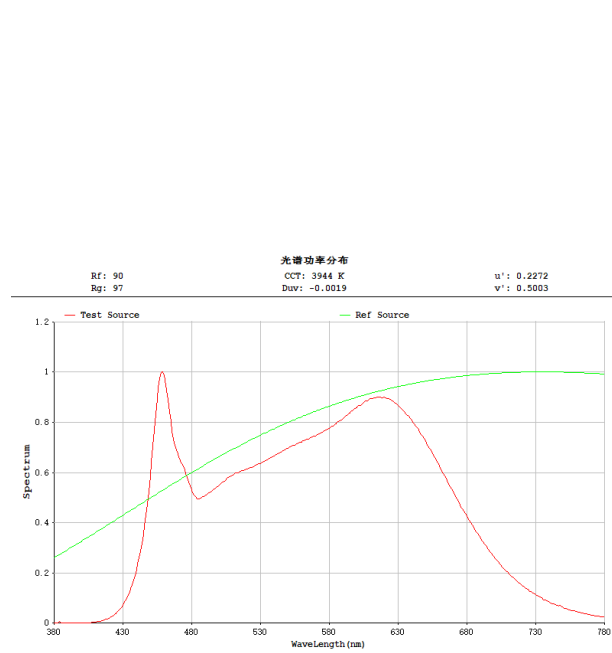
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	419.969
Luminous Efficacy (lm/W)	74.38
Beam Angle (°)	38.4
Center Beam Candle Power (cd)	929.3

Spectral Power Distribution & Chromaticity Diagram



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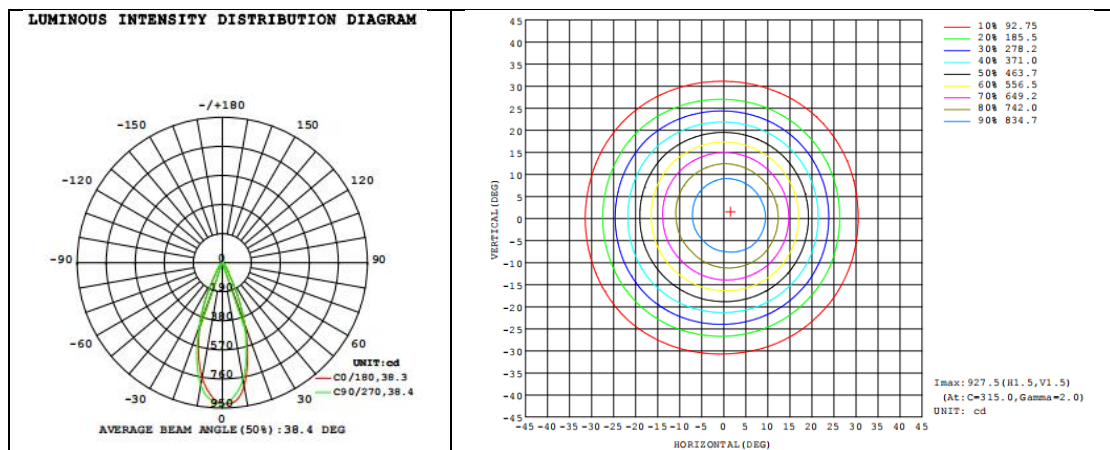


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	365.8	87.10%
0-40	403.4	96.05%
0-60	419.9	99.98%
60-90	0.1	0.02%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	420.0	100.00%
90-180	0.0	0.00%
0-180	420.0	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	81.95	19.51%	90-100	0	0%
10-20	170.6	40.62%	100-110	0	0%
20-30	113.30	26.98%	110-120	0	0%
30-40	37.55	8.94%	120-130	0	0%
40-50	13.40	3.19%	130-140	0	0%
50-60	3.139	0.75%	140-150	0	0%
60-70	0.0412	0.01%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data



2.1.5 Electrical, Photometric and Chromaticity Measurements

Test date	2024-09-03	Test Ambient:	25.3
Test Orientation	As intended	Stabilization Time (min)	15
Model Number	GR2TLB	CCT Setting	5000k

Electrical Measurement:

Sampel No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
#1	120.7	60	0.051	5.88	0.957

Chromaticity Measurement - Sphere-Spectroradiometer Method:

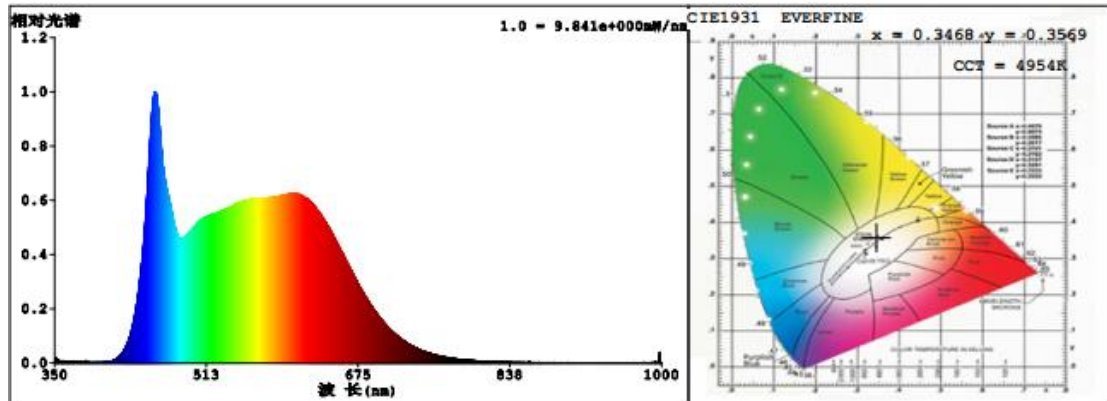
Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
CCT (K)	4954
Duv	0.00193
Chromaticity (x, y)	x=0.3468, y=0.3569
Chromaticity (u', v')	u' =0.2106, v' =0.4875
Color Rendering Index (CRI)	92.1
R9	69

Special Color Rendering Indices			
R1	95	R9	69
R2	99	R10	98
R3	95	R11	90
R4	87	R12	69
R5	92	R13	97
R6	96	R14	98
R7	89	R15	91
R8	84	--	--

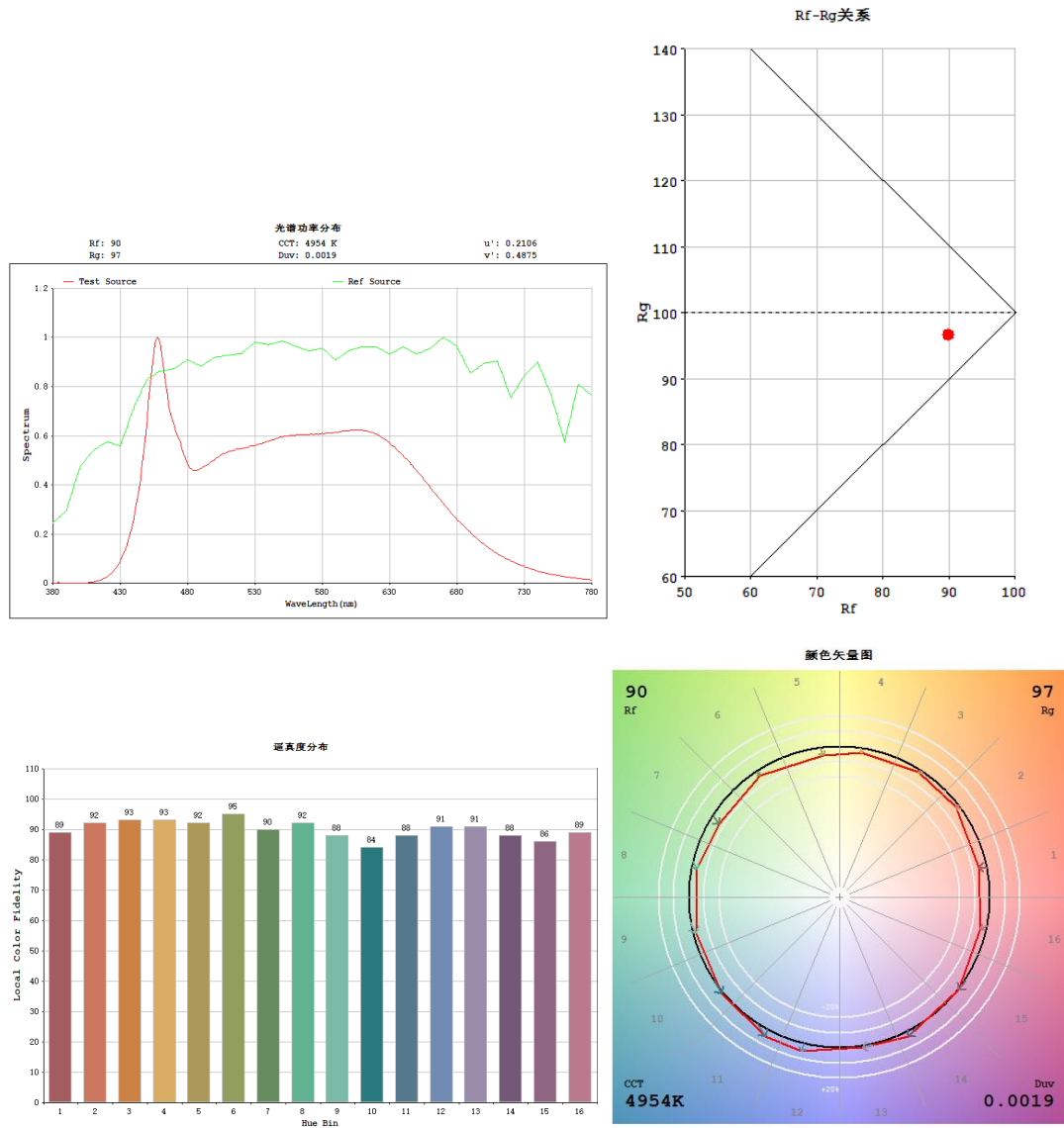
Photometric Measurement – Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.7
Frequency (Hz)	60
Total Luminous (lm)	412.282
Luminous Efficacy (lm/W)	70.18
Beam Angle (°)	38.4
Center Beam Candle Power (cd)	907.4

Spectral Power Distribution & Chromaticity Diagram



TM30

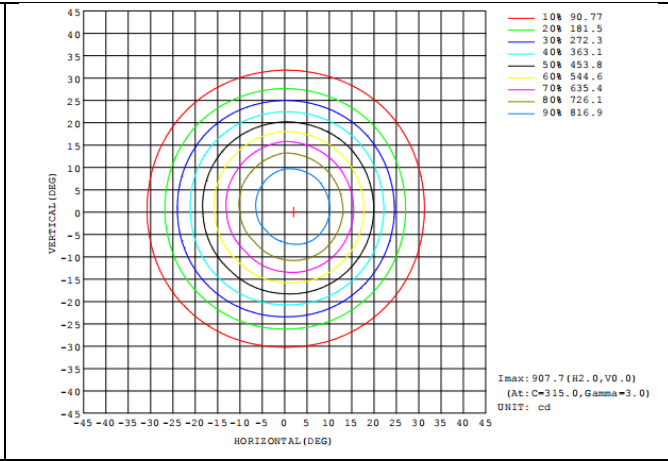
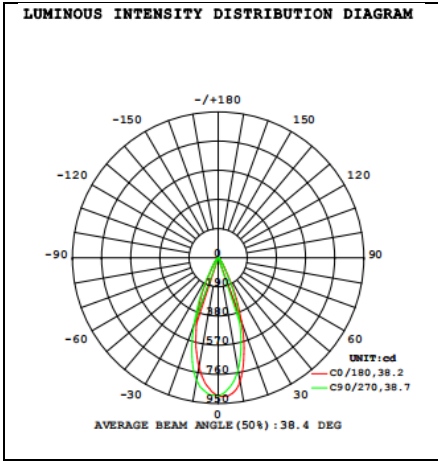


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	358.8	87.02%
0-40	395.9	96.02%
0-60	412.2	99.98%
60-90	0.1	0.02%
70-100	0.0	0.00%
90-120	0.0	0.00%
0-90	412.3	100.00%
90-180	0.0	0.00%
0-180	412.3	100.00%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	79.88	19.37%	90-100	0	0%
10-20	167.2	40.55%	100-110	0	0%
20-30	111.70	27.09%	110-120	0	0%
30-40	37.12	9.00%	120-130	0	0%
40-50	13.23	3.21%	130-140	0	0%
50-60	3.096	0.75%	140-150	0	0%
60-70	0.0409	0.01%	150-160	0	0%
70-80	0.0000	0.00%	160-170	0	0%
80-90	0.0000	0.00%	170-180	0	0%

Photometric Data



Flux out: 247.1 lm

Height	Eavg, Emax	Angle: 38.21deg	Diameter
1m	593.7, 906.01lx		69.27cm
2m	148.4, 226.51lx		138.54cm
3m	65.96, 100.71lx		207.81cm
4m	37.10, 56.63lx		277.08cm
5m	23.75, 36.24lx		346.34cm
6m	16.49, 25.17lx		415.61cm
7m	12.12, 18.49lx		484.88cm
8m	9.276, 14.16lx		554.15cm
9m	7.329, 11.19lx		623.42cm
10m	5.937, 9.06lx		692.69cm

Note: The curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

